

## DTD Reference

# Novell® Identity Manager

**3.6**

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# Contents

|                         |           |
|-------------------------|-----------|
| <b>About This Guide</b> | <b>11</b> |
| <b>1 DTD Overview</b>   | <b>13</b> |
| <b>2 Filter DTD</b>     | <b>15</b> |
| 2.1 Filter Elements     | 15        |
| filter                  | 16        |
| filter-attr             | 18        |
| filter-class            | 21        |
| <b>3 NDS DTD</b>        | <b>23</b> |
| 3.1 NDS DTD Elements    | 23        |
| add                     | 27        |
| add-association         | 30        |
| add-attr                | 32        |
| add-value               | 34        |
| allow-attr              | 35        |
| allow-class             | 37        |
| app-name                | 38        |
| association             | 39        |
| attr                    | 41        |
| attr-def                | 42        |
| attr-name               | 44        |
| attr-name-map           | 45        |
| authentication-info     | 47        |
| check-object-password   | 48        |
| check-password          | 50        |
| class-def               | 51        |
| class-name              | 52        |
| component               | 53        |
| config-object           | 54        |
| contact                 | 55        |
| copy-attr               | 56        |
| copy-name               | 58        |
| copy-path               | 59        |
| copy-path-suffix        | 60        |
| create-rule             | 61        |
| create-rules            | 63        |
| delete                  | 65        |
| driver-config           | 67        |
| driver-filter           | 69        |
| driver-options          | 70        |
| driver-state            | 71        |
| get-named-password      | 72        |
| init-params             | 73        |
| input                   | 77        |
| instance                | 79        |
| match-attr              | 81        |
| match-class             | 83        |
| match-path              | 84        |

|                              |     |
|------------------------------|-----|
| matching-rule . . . . .      | 86  |
| matching-rules . . . . .     | 88  |
| modify . . . . .             | 90  |
| modify-association . . . . . | 93  |
| modify-attr . . . . .        | 94  |
| modify-password . . . . .    | 96  |
| move . . . . .               | 99  |
| nds . . . . .                | 102 |
| nds-name . . . . .           | 104 |
| new-name . . . . .           | 105 |
| old-password . . . . .       | 106 |
| operation-data . . . . .     | 107 |
| output . . . . .             | 109 |
| parent . . . . .             | 110 |
| password . . . . .           | 112 |
| placement . . . . .          | 113 |
| placement-rule . . . . .     | 114 |
| placement-rules . . . . .    | 116 |
| publisher-options . . . . .  | 119 |
| publisher-state . . . . .    | 120 |
| query . . . . .              | 121 |
| query-ex . . . . .           | 125 |
| query-schema . . . . .       | 129 |
| query-token . . . . .        | 130 |
| read-attr . . . . .          | 131 |
| read-parent . . . . .        | 132 |
| remove-all-values . . . . .  | 133 |
| remove-association . . . . . | 134 |
| remove-value . . . . .       | 135 |
| rename . . . . .             | 136 |
| required-attr . . . . .      | 139 |
| schema-def . . . . .         | 141 |
| search-attr . . . . .        | 144 |
| search-class . . . . .       | 145 |
| server . . . . .             | 146 |
| source . . . . .             | 147 |
| status . . . . .             | 148 |
| subscriber-options . . . . . | 150 |
| subscriber-state . . . . .   | 151 |
| sync . . . . .               | 152 |
| template . . . . .           | 154 |
| user . . . . .               | 155 |
| value . . . . .              | 156 |

## **4 Map DTD 161**

|                                |     |
|--------------------------------|-----|
| 4.1 Map DTD Elements . . . . . | 161 |
| col . . . . .                  | 162 |
| col-def . . . . .              | 163 |
| mapping-table . . . . .        | 165 |
| row . . . . .                  | 167 |

## **5 DirXML Script DTD 169**

|  |     |
|--|-----|
| 5.1 DirXML Script DTD Elements . . . . . | 169 |
| actions . . . . .                        | 175 |
| and . . . . .                            | 179 |
| arg-actions . . . . .                    | 181 |

|                                       |     |
|---------------------------------------|-----|
| arg-association . . . . .             | 184 |
| arg-component . . . . .               | 188 |
| arg-conditions . . . . .              | 191 |
| arg-dn . . . . .                      | 192 |
| arg-match-attr . . . . .              | 196 |
| arg-node-set . . . . .                | 197 |
| arg-object . . . . .                  | 200 |
| arg-password . . . . .                | 201 |
| arg-string . . . . .                  | 206 |
| arg-value . . . . .                   | 210 |
| comment . . . . .                     | 214 |
| component . . . . .                   | 215 |
| conditions . . . . .                  | 216 |
| description . . . . .                 | 218 |
| do-add-association . . . . .          | 219 |
| do-add-dest-attr-value . . . . .      | 221 |
| do-add-dest-object . . . . .          | 223 |
| do-add-role . . . . .                 | 225 |
| do-add-src-attr-value . . . . .       | 228 |
| do-add-src-object . . . . .           | 230 |
| do-append-xml-element . . . . .       | 232 |
| do-append-xml-text . . . . .          | 234 |
| do-break . . . . .                    | 236 |
| do-clear-dest-attr-value . . . . .    | 237 |
| do-clear-op-property . . . . .        | 239 |
| do-clear-src-attr-value . . . . .     | 240 |
| do-clear-sso-credential . . . . .     | 242 |
| do-clone-op-attr . . . . .            | 244 |
| do-clone-xpath . . . . .              | 245 |
| do-delete-dest-object . . . . .       | 247 |
| do-delete-src-object . . . . .        | 249 |
| do-find-matching-object . . . . .     | 251 |
| do-for-each . . . . .                 | 253 |
| do-generate-event . . . . .           | 255 |
| do-if . . . . .                       | 258 |
| do-implement-entitlement . . . . .    | 260 |
| do-move-dest-object . . . . .         | 262 |
| do-move-src-object . . . . .          | 264 |
| do-reformat-op-attr . . . . .         | 266 |
| do-remove-association . . . . .       | 268 |
| do-remove-dest-attr-value . . . . .   | 270 |
| do-remove-role . . . . .              | 272 |
| do-remove-src-attr-value . . . . .    | 274 |
| do-rename-dest-object . . . . .       | 276 |
| do-rename-op-attr . . . . .           | 278 |
| do-rename-src-object . . . . .        | 279 |
| do-send-email . . . . .               | 281 |
| do-send-email-from-template . . . . . | 284 |
| do-set-default-attr-value . . . . .   | 287 |
| do-set-dest-attr-value . . . . .      | 289 |
| do-set-dest-password . . . . .        | 291 |
| do-set-local-variable . . . . .       | 293 |
| do-set-op-association . . . . .       | 295 |
| do-set-op-class-name . . . . .        | 296 |
| do-set-op-dest-dn . . . . .           | 297 |
| do-set-op-property . . . . .          | 298 |
| do-set-op-src-dn . . . . .            | 300 |
| do-set-op-template-dn . . . . .       | 301 |
| do-set-src-attr-value . . . . .       | 302 |

|  |     |
|--|-----|
| do-set-src-password . . . . .              | 304 |
| do-set-sso-credential . . . . .            | 306 |
| do-set-sso-passphrase . . . . .            | 308 |
| do-set-xml-attr . . . . .                  | 310 |
| do-start-workflow . . . . .                | 312 |
| do-status . . . . .                        | 314 |
| do-strip-op-attr . . . . .                 | 316 |
| do-strip-xpath . . . . .                   | 317 |
| do-trace-message . . . . .                 | 318 |
| do-veto . . . . .                          | 320 |
| do-veto-if-op-attr-not-available . . . . . | 321 |
| do-while . . . . .                         | 322 |
| if-association . . . . .                   | 324 |
| if-attr . . . . .                          | 326 |
| if-class-name . . . . .                    | 328 |
| if-dest-attr . . . . .                     | 330 |
| if-dest-dn . . . . .                       | 332 |
| if-entitlement . . . . .                   | 334 |
| if-global-variable . . . . .               | 337 |
| if-local-variable . . . . .                | 339 |
| if-named-password . . . . .                | 341 |
| if-op-attr . . . . .                       | 343 |
| if-op-property . . . . .                   | 346 |
| if-operation . . . . .                     | 348 |
| if-password . . . . .                      | 350 |
| if-src-attr . . . . .                      | 352 |
| if-src-dn . . . . .                        | 354 |
| if-xml-attr . . . . .                      | 356 |
| if-xpath . . . . .                         | 358 |
| include . . . . .                          | 360 |
| or . . . . .                               | 361 |
| policy . . . . .                           | 363 |
| rule . . . . .                             | 368 |
| token-added-entitlement . . . . .          | 369 |
| token-association . . . . .                | 371 |
| token-attr . . . . .                       | 373 |
| token-base64-decode . . . . .              | 375 |
| token-base64-encode . . . . .              | 378 |
| token-char . . . . .                       | 382 |
| token-class-name . . . . .                 | 384 |
| token-convert-time . . . . .               | 386 |
| token-dest-attr . . . . .                  | 391 |
| token-dest-dn . . . . .                    | 393 |
| token-dest-name . . . . .                  | 395 |
| token-document . . . . .                   | 397 |
| token-entitlement . . . . .                | 399 |
| token-escape-for-dest-dn . . . . .         | 401 |
| token-escape-for-src-dn . . . . .          | 405 |
| token-generate-password . . . . .          | 409 |
| token-global-variable . . . . .            | 411 |
| token-join . . . . .                       | 413 |
| token-local-variable . . . . .             | 417 |
| token-lower-case . . . . .                 | 419 |
| token-map . . . . .                        | 423 |
| token-named-password . . . . .             | 427 |
| token-op-attr . . . . .                    | 429 |
| token-op-property . . . . .                | 431 |
| token-operation . . . . .                  | 433 |
| token-parse-dn . . . . .                   | 435 |



|                           |     |
|---------------------------|-----|
| token-password            | 440 |
| token-query               | 442 |
| token-removed-attr        | 445 |
| token-removed-entitlement | 447 |
| token-replace-all         | 449 |
| token-replace-first       | 453 |
| token-resolve             | 457 |
| token-split               | 459 |
| token-src-attr            | 463 |
| token-src-dn              | 465 |
| token-src-name            | 467 |
| token-substring           | 469 |
| token-text                | 473 |
| token-time                | 475 |
| token-unique-name         | 477 |
| token-unmatched-src-dn    | 481 |
| token-upper-case          | 483 |
| token-xml-parse           | 487 |
| token-xml-serialize       | 491 |
| token-xpath               | 495 |

## 6 DirXML Entitlements DTD 497

|                                      |     |
|--------------------------------------|-----|
| 6.1 DirXML Entitlements DTD Elements | 498 |
| description                          | 500 |
| display-name                         | 501 |
| dn                                   | 502 |
| ent-value                            | 503 |
| entitlement                          | 504 |
| entitlement-impl                     | 506 |
| id                                   | 508 |
| item                                 | 509 |
| item-description                     | 510 |
| item-display-name                    | 511 |
| item-value                           | 512 |
| items                                | 513 |
| msg                                  | 514 |
| param                                | 515 |
| query-app                            | 516 |
| query-xml                            | 517 |
| ref                                  | 518 |
| result                               | 519 |
| result-set                           | 520 |
| src                                  | 521 |
| state                                | 522 |
| status                               | 523 |
| timestamp                            | 524 |
| token-association                    | 525 |
| token-attr                           | 526 |
| token-src-dn                         | 527 |
| value                                | 528 |
| values                               | 529 |

## 7 Jobs DTD 531

|              |     |
|--------------|-----|
| 7.1 Jobs XML | 531 |
| audit        | 533 |
| bcc          | 534 |

|     |                         |     |
|-----|-------------------------|-----|
|     | cc .....                | 535 |
|     | containment .....       | 536 |
|     | description .....       | 537 |
|     | email .....             | 538 |
|     | java-class .....        | 539 |
|     | job-aggregation .....   | 540 |
|     | job-definition .....    | 541 |
|     | reply-to .....          | 542 |
|     | result-processing ..... | 543 |
|     | to .....                | 544 |
|     | xliff .....             | 545 |
| 7.2 | Example Job XML .....   | 545 |

# About This Guide

This guide is a reference to the document type definitions (DTD) that Identity Manager uses. The guide contains definitions for each of the elements used in Identity Manager. There are separate DTDs for different components of Identity Manager.

- ♦ “Filter DTD” on page 15
- ♦ “NDS DTD” on page 23
- ♦ “Map DTD” on page 161
- ♦ “DirXML Script DTD” on page 169
- ♦ “DirXML Entitlements DTD” on page 497
- ♦ “Jobs DTD” on page 531

## Audience

This guide is intended as a reference for Identity Manager consultants.

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## Documentation Conventions

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When a single pathname can be written with a backslash for some platforms or a forward slash for other platforms, the pathname is presented with a backslash. Users of platforms that require a forward slash, such as Linux or UNIX, should use forward slashes as required by your software.



# DTD Overview

# 1

This guide is a reference for the Identity Manager document type definitions (DTD). There are separate DTDs for different components of Identity Manager:

- ♦ “Filter DTD” on page 15
- ♦ “NDS DTD” on page 23
- ♦ “Map DTD” on page 161
- ♦ “DirXML Script DTD” on page 169
- ♦ “DirXML Entitlements DTD” on page 497
- ♦ “Jobs DTD” on page 531

## What’s New in Identity Manager 3.6

- ♦ Added **Jobs DTD** section that provides introductory information about the XML structure used to create scheduled Jobs in Identity Manager.
- ♦ Added **do-add-role** and **do-remove-role**.
- ♦ Changed **do-send-email-from-template** to allow sending html content from policy.
- ♦ Made attribute `policy-dn` optional for **token-generate-password**.
- ♦ Changed **do-find-matching-object** to set a local variable if they encounter an error and provide additional information in the server log.
- ♦ Added `offset` and `offset-unit` attribute to **token-convert-time**.
- ♦ Added optional `default-value` attribute to **token-map**.
- ♦ Added optional `old-password` attribute to **do-set-src-password** and **do-set-dest-password**.



# Filter DTD

# 2

An Identity Manager filter is primarily for controlling which object classes are synchronized and which attributes are synchronized for those object classes. Additionally, other behaviors of those classes and attributes within Identity Manager are controlled through the filter.

An Identity Manager filter consists of a top level <filter> element that contains a set of <filter-class> elements, each of which contains a set of <filter-attr> elements. The filter for a particular driver is stored in the DirXML-DriverFilter attribute on the DirXML-Driver object.

See “[Filter Elements](#)” on page 15 for a list of all the elements in the Filter DTD.

## 2.1 Filter Elements

| Element                      | Description   |
|------------------------------|---|
| <a href="#">filter</a>       | Filter for an Identity Manager driver.                  |
| <a href="#">filter-attr</a>  | Behavior of an attribute for a particular object class. |
| <a href="#">filter-class</a> | Behavior of an object class.                            |

# filter

Consists of a set of **<filter-class>** elements that describe the object classes used by a particular instance of an Identity Manager driver.

## Example

```
<filter>
  <filter-class class-name="User"
    subscriber="sync"
    publisher="sync">

    <filter-attr attr-name="CN"
      subscriber="sync"
      publisher="ignore"
      merge-authority="none"/>

    <filter-attr attr-name="Surname"
      subscriber="sync"/>

    <filter-attr attr-name="Given name"
      subscriber="sync"/>

    <filter-attr attr-name="Internet EMail Address"
      publisher="sync"
      publisher-optimize-modify="false"/>

    <filter-attr attr-name="Login Disabled"
      subscriber="notify"/>
  </filter-class>
  <filter-class class-name="Group"
    subscriber="sync"
    publisher="sync">
    publisher-create-homedir="false">

    <filter-attr attr-name="CN"
      subscriber="sync"
      merge-authority="none"/>

    <filter-attr attr-name="Member"
      subscriber="sync"
      publisher="sync"
      merge-authority="publisher"
      publisher-optimize-modify="false"/>
  </filter-class>
</filter>
```

## Allowed Content

| Element             | Description                  |
|---------------------|------------------------------|
| <b>filter-class</b> | Behavior of an object class. |



## Attributes

None

## Content Rule

(**filter-class**\*)

## Parent Elements

None

## filter-attr

Describes an attribute of the enclosing `<filter-class>` that is used by a particular instance of an Identity Manager driver. The `attr-name` attribute specifies the name of an attribute in eDirectory™. The `publisher` and `subscriber` attributes control whether this attribute is synchronized on the respective channels according to the following table. If the channel setting for the object class as a whole is ignored, then the setting for individual attributes is ignored.

### Remarks

The `publisher` and `subscriber` attributes control whether this attribute is synchronized on the respective channels according to the following table. If the channel setting for the object class as a whole is ignored, then the setting for individual attributes is ignored.

| Value  | Description  |
|--------|--|
| ignore | Changes to this attribute are not reported or automatically synchronized.  |
| notify | Changes to this attribute are reported but not automatically synchronized.   |
| sync   | Changes to this attribute are reported and automatically synchronized.   |
| reset  | Changes to this attribute are reported and triggers the attribute to be automatically reset to the values from the other channel. It is illegal for both Publisher and Subscriber to reset for the same attribute. |

The `merge-authority` attribute controls the behavior of the attribute during a merge operation according to the following table:

| Value   | Behavior  | Valid   |
|---------|---|---|
| default | <p>1. If an attribute is not being synchronized in either channel, then no merging occurs.</p> <p>2. If an attribute is being synchronized in one channel and not the other, then all existing values on the destination for that channel are removed and replaced with the values from the source for that channel. If the source has multiple values and the destination can only accommodate a single value, then only one of the values is used on the destination side, although it is undefined which of those values are used.</p> <p>3. If an attribute is being synchronized in both channels and both sides can accommodate multiple values, then each side ends up with the union of values present on either side.</p> <p>4. If an attribute is being synchronized in both channels and both sides can accommodate only a single value, the application ends up with the value from eDirectory unless there is no value in eDirectory. In this case eDirectory ends up with the value from the application (if any).</p> <p>5. If an attribute is synchronized in both channels and only one side can accommodate multiple values then the single-valued side's value is added to the value from the multiple-value side if it is already there. If there is no value on the single-valued side one of the values (undefined) is added to the single-valued side.</p> | Always  |
| edir    | Has the same behavior as the default if the attributes are synchronized on the Subscriber channel and not on the Publisher channel.   | When synchronizing or notifying on the Subscriber channel |
| app     | Has the same behavior as the default if the attributes are synchronized on the Publisher channel and not on the Subscriber channel.   | When synchronizing or notifying on the Publisher channel  |
| none    | No merging occurs regardless of synchronization.  | Always  |

The publisher-optimize-modify attribute controls whether or not changes to this attribute are examined on the Publisher channel to determine the minimal change needed in the Identity Vault.

## Example

See `<filter>`.

## Allowed Content

EMPTY

## Attributes

| Attribute                 | Possible Values   | Default Value |
|---------------------------|---|---------------|
| attr-name                 | CDATA<br>Name of the attribute.   | #REQUIRED     |
| merge-authority           | default   edir   app   none<br>Flag that controls how this attribute is merged.             | default       |
| publisher                 | ignore   notify   sync   reset<br>Flag that controls Publisher channel synchronization.     | ignore        |
| publisher-optimize-modify | true   false<br>Flag that controls optimization of modifications on the Subscriber channel. | true          |
| subscriber                | ignore   notify   sync   reset<br>Flag that controls Subscriber channel synchronization.    | ignore        |

## Content Declaration

Empty

## Parent Elements

| Element             | Description                  |
|---------------------|------------------------------|
| <b>filter-class</b> | Behavior of an object class. |

## filter-class

Describes an object class that is used by a particular instance of an Identity Manager driver. The class-name attribute specifies the name of an effective (that is, structural or base) class in eDirectory and only applies to objects that have that particular base class.

### Remarks

The Publisher and Subscriber attributes control whether this class is synchronized on the respective channels.

| Value  | Description  |
|--------|--|
| ignore | Changes to the objects of this class are not reported or automatically synchronized. |
| sync   | Changes to the objects of this class are reported and automatically synchronized.    |

The publisher-track-template-member attribute controls whether or not the Publisher channel maintains the Member of Template attribute when it creates objects from a template. The publisher-create-homedir attribute controls whether or not a NetWare<sup>®</sup> home directory is automatically created when a User is created with the Home Directory attribute populated.

### Example

See <filter>.

### Allowed Content

| Element     | Description   |
|-------------|---|
| filter-attr | Behavior of an attribute for a particular object class. |

### Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| class-name | CDATA<br>Name of the object class.                                     | #REQUIRED     |
| publisher  | ignore   sync<br>Flag that controls Publisher channel synchronization. | ignore        |

| Attribute                       | Possible Values  | Default Value |
|---------------------------------|--|---------------|
| publisher-create-homedir        | true   false<br>Flag that controls automatic creation of home directories. | true          |
| publisher-track-template-member | true   false<br>Flag that controls the tracking of objects.                | false         |
| subscriber                      | ignore   sync<br>Flag that controls Publisher channel synchronization.     | ignore        |

## Content Rule

**filter-attr**

## Parent Elements

| Element       | Description                            |
|---------------|--|
| <b>filter</b> | Filter for an Identity Manager driver. |

The NDS™ document type definition file (`nds.dtd`) defines the schema of the XML documents that the Identity Manager engine can process. XML documents that do not conform to this schema generate errors.

The `nds.dtd` file defines the following:

- ♦ Input and output commands and events (such as add, delete, modify, and rename) that can be performed on entries and the data that must be included with each.
- ♦ Driver initialization operations (such as authentication information, driver filter, configuration options, and state) for the driver shim, publisher shim, and subscriber shim and the data that these operations require.
- ♦ Schema operations for defining class and attribute definitions.
- ♦ Rules for schema mapping, matching, creation, and placement.

Remember the following when reading a DTD file:

| Marker | Meaning   |
|--------|---|
| ?      | 0 or 1 of these can be included.                          |
| +      | 1 or more of these must be included.                      |
| *      | 0 or more of these can be included.                       |
| CDATA  | Character data.   |
| PCDATA | Parsed character data.                                    |
| <!     | Beginning of an element, entity, or attribute definition. |
| >      | End of an element, entity, or attribute definition.       |

See “NDS DTD Elements” on page 23 for a list of all of the elements in the NDS DTD.

## 3.1 NDS DTD Elements

| Element                      | Description                              |
|------------------------------|--|
| <code>add</code>             | Adds an object when an add event occurs. |
| <code>add-association</code> | Adds an association.                     |
| <code>add-attr</code>        | Adds an attribute.                       |
| <code>add-value</code>       | Adds values.                             |
| <code>allow-attr</code>      | Allows an attribute in the filter.       |
| <code>allow-class</code>     | Allows a class in the filter.            |
| <code>app-name</code>        | Names in the application namespace.      |

| Element               | Description   |
|-----------------------|---|
| association           | Unique key of the application object.   |
| attr                  | Current state of an attribute.  |
| attr-def              | Schema attribute definition.  |
| attr-name             | Maps an attribute name.   |
| attr-name-map         | Top-level element for Schema Mapping policies.                                      |
| authentication-info   | Information for connecting and authenticating to the application.                   |
| check-object-password | Checks the password against an eDirectory object.                                   |
| check-password        | Checks the password against an eDirectory driver object.                            |
| class-def             | Schema class definition.  |
| class-name            | Maps a class name.  |
| component             | Component of a structured attribute.  |
| config-object         | eDirectory object to use for additional configuration data.                         |
| contact               | Point of contact for the originating product.                                       |
| copy-attr             | Copies an attribute token. Deprecated as of Identity Manager 2.0.                   |
| copy-name             | Copies a name token. Deprecated as of Identity Manager 2.0.                         |
| copy-path             | Copies a path token. Deprecated as of Identity Manager 2.0.                         |
| copy-path-suffix      | Copies a path token. Deprecated as of Identity Manager 2.0.                         |
| create-rule           | Object creation rule. Deprecated as of Identity Manager 2.0.                        |
| create-rules          | Top-level element for object creation rules. Deprecated as of Identity Manager 2.0. |
| delete                | Deletes an object when a delete event occurs.                                       |
| driver-config         | Driver-specific Driver Shim configuration options.                                  |
| driver-filter         | Publication and Subscription class and attribute event filter.                      |
| driver-options        | Driver-specific Driver Shim configuration options.                                  |
| driver-state          | Driver-specific state information.  |
| get-named-password    | Retrieves a named password for a driver.  |
| init-params           | Initialization parameters for the DriverShim, SubscriptionShim, or PublicationShim. |



| Element                         | Description  |
|---------------------------------|--|
| <code>tinput</code>             | Input events or commands.  |
| <code>instance</code>           | Current state of an instance of an object.   |
| <code>match-attr</code>         | Matches an attribute. Deprecated as of Identity Manager 2.0.                         |
| <code>match-class</code>        | Matches a class name. Deprecated as of Identity Manager 2.0.                         |
| <code>match-path</code>         | Matches a path. Deprecated as of Identity Manager 2.0.                               |
| <code>matching-rule</code>      | Object matching rule. Deprecated as of Identity Manager 2.0.                         |
| <code>matching-rules</code>     | Top-level element for object matching rules. Deprecated as of Identity Manager 2.0.  |
| <code>modify</code>             | Modifies an object when a modify event occurs.                                       |
| <code>modify-association</code> | Modifies an association command.   |
| <code>modify-attr</code>        | Modifies an attribute.   |
| <code>modify-password</code>    | Modifies an object password when a modify event for a password occurs.               |
| <code>move</code>               | Moves an object when a move event occurs.  |
| <code>nds</code>                | Top-level element for all Identity Manager and Driver communication.                 |
| <code>nds-name</code>           | Name in the eDirectory namespace.  |
| <code>new-name</code>           | The new name of a renamed object.  |
| <code>old-password</code>       | The old authentication password.   |
| <code>operation-data</code>     | The operation adds additional custom data.   |
| <code>output</code>             | Results of events or commands.   |
| <code>parent</code>             | The parent container of an object.   |
| <code>password</code>           | The authentication password.   |
| <code>placement</code>          | Object placement specifier. Deprecated as of Identity Manager 2.0.                   |
| <code>placement-rule</code>     | Object placement rule. Deprecated as of Identity Manager 2.0.                        |
| <code>placement-rules</code>    | Top-level element for object placement rules. Deprecated as of Identity Manager 2.0. |
| <code>publisher-options</code>  | Driver-specific PublicationShim configuration options.                               |
| <code>publisher-state</code>    | Driver PublicationShim state information.  |
| <code>query</code>              | Query command.   |

| Element            | Description  |
|--------------------|--|
| query-ex           | Query command with result count limit.                       |
| query-schema       | Query schema command.  |
| query-token        | Opaque handle for query-ex commands                          |
| rread-attr         | Returns specified object attribute values.                   |
| read-parent        | Returns the object parent container.                         |
| remove-all-values  | Removes all attribute values.                                |
| remove-association | Removes an association.                                      |
| remove-value       | Removes specified attribute values.                          |
| rename             | Renames an object when a rename event occurs.                |
| required-attr      | Required attribute. Deprecated as of Identity Manager 2.0.   |
| schema-def         | Schema definition.   |
| search-attr        | Query search attribute value filter.                         |
| search-class       | Query search class filter.                                   |
| server             | The authentication server.                                   |
| source             | The source or creator of the document.                       |
| status             | Status of the processing of a command or event.              |
| subscriber-options | Driver-specific SubscriptionShim configuration options.      |
| subscriber-state   | Driver SubscriptionShim state information.                   |
| sync               | Resynchronization or migrate event.                          |
| template           | Specifies a template. Deprecated as of Identity Manager 2.0. |
| user               | The authentication user name                                 |
| value              | The attribute value.   |

# add

Used as an event notification from the PublicationShim to Identity Manager when an object is added in the application. When it is used as a notification, an **<association>** is required. It is also used as a command from Identity Manager to the SubscriptionShim to add an object in the application.

## Remarks

**<add>** contains an **<add-attr>** for each attribute of the object added.

**<add>** might contain a **<password>** for the object added.

A response to **<add>** should be a **<status>** indicating whether or not the **<add>** was processed successfully. When used as a command, **<add>** should also return an **<add-association>** that contains the unique key for the newly added object. The dest-dn and dest-entry-id attributes of the **<add-association>** should be set to the src-dn and src-entry-id of the **<add>**.

## Example

```
<add class-name="User" src-dn="\Sam">
  <association>1012</association>
  <add-attr attr-name="cn">
    <value>Sam</value>
  </add-attr>
  <add-attr attr-name="Surname">
    <value>Jones</value>
  </add-attr>
  <add-attr attr-name="Given Name">
    <value>Sam</value>
  </add-attr>
  <add-attr attr-name="Telephone Number">
    <value>555-1212</value>
  </add-attr>
</add>
```

## Allowed Content

| Element        | Description                                |
|----------------|--|
| association    | Unique key of the application object.      |
| add-attr       | Add attribute.                             |
| password       | The authentication password.               |
| operation-data | The operation adds additional custom data. |

## Attributes

| Attribute        | Possible Values   | Default Value |
|------------------|---|---------------|
| class-name       | CDATA<br><br>The name of the base class of the object. The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory™ namespace and a driver sees the name in the application namespace. | #REQUIRED     |
| dest-dn          | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.<br><br>Should be left empty for event notifications. Filled in by the Placement policy on commands.  | #IMPLIED      |
| dest-entry-id    | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |
| event-id         | CDATA<br><br>An identifier used to tag the results of an event or command.<br><br>Should be copied to the event-id attribute of the resulting <b>&lt;status&gt;</b> and <b>&lt;add-association&gt;</b> elements.  | #IMPLIED      |
| qualified-src-dn | CDATA<br><br>The qualified version of src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |
| src-dn           | CDATA<br><br>The distinguished name of source object that generated the event in the namespace of the sender.<br><br>Should be copied to the dest-dn attribute of the resulting <b>&lt;add-association&gt;</b> for commands.  | #IMPLIED      |

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| src-entry-id | CDATA<br><br>The entry ID of source object that generated the event in the namespace of the sender.<br><br>Should be copied to the dest-entry-id attribute of the resulting <b>&lt;add-association&gt;</b> for commands.                                | #IMPLIED      |
| template-dn  | CDATA<br><br>The distinguished name of a template in the receiver's namespace to use as a basis for creating the object.<br><br>Filled in by the Create policy for commands. Drivers only need to implement this if it makes sense for the application. | #IMPLIED      |
| timestamp    | CDATA<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |

## Content Rule

( association ? , add-attr \* , password ? , operation-data ? )

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# add-association

Used to return the unique key of an object added as the result of an `<add>` command.

## Example

```
<add-association dest-dn="\Users\Samuel" dest-entry-id="33974">
  {BC3E7155-CDF9-d311-9846-0008C76B16C2}
</add-association>
```

## Allowed Content

#PCDATA

| Element                     | Description                            |
|-----------------------------|--|
| <code>operation-data</code> | Operation adds additional custom data. |

## Attributes

| Attribute     | Possible Values   | Default Value |
|---------------|---|---------------|
| dest-dn       | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.<br><br>Should be set to the src-dn of the <code>&lt;add&gt;</code> . | #REQUIRED     |
| dest-entry-id | CDATA<br><br>The entry id of the target object in the namespace of the receiver.<br><br>Should be set to the src-entry-id of the <code>&lt;add&gt;</code> .     | #IMPLIED      |
| event-id      | CDATA<br><br>An identifier used to tag the results of an event or command.<br><br>Should be set to the event-id of the <code>&lt;add&gt;</code> .               | #IMPLIED      |

## Content Rule

( #PCDATA | operation-data ) \*

## Parent Elements

| Element | Description                    |
|---------|--------------------------------|
| input   | Input events or commands.      |
| output  | Results of events or commands. |

# add-attr

Used to specify the attribute values for an <add> operation or event. Each <add-attr> should contain at least one <value>

## Example

See <add>.

## Allowed Content

| Element | Description          |
|---------|----------------------|
| value   | The attribute value. |

## Attributes

| Attribute               | Possible Values   | Default Value |
|-------------------------|---|---------------|
| attr-name               | CDATA<br><br>The name of the attribute.<br><br>The name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. The mapping rule uses the class name attribute of the enclosing command or event to determine which class to use for mapping the attribute name. | #REQUIRED     |
| enforce-password-policy | true   false<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |

## Content Rule

( value + )



## Parent Elements

| Element          | Description                              |
|------------------|--|
| <code>add</code> | Adds an object when an add event occurs. |

## add-value

Used to specify values added to the attribute specified in the enclosing `<modify-attr>`. A driver should gracefully ignore an `<add-value>` for a value that already exists and continue to process the remainder of the enclosing `<modify>`.

### Example

See `<modify>`.

### Allowed Content

| Element            | Description          |
|--------------------|----------------------|
| <code>value</code> | The attribute value. |

### Attributes

None

### Parent Elements

| Element                  | Description            |
|--------------------------|------------------------|
| <code>modify-attr</code> | Modifies an attribute. |

# allow-attr

Used to specify attributes that are allowed in the event filter for the class specified in the enclosing `<allow-class>`.

## Example

See `<init-params>`.

## Allowed Content

EMPTY

## Attributes

| Attribute    | Possible Values  | Default Value |
|--------------|--|---------------|
| attr-name    | CDATA<br><br>The name of the attribute.<br><br>The name is mapped between the application and eDirectorynamespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. The mapping rule uses the class name attribute of the enclosing command or event to determine which class to use for mapping the attribute name. | #REQUIRED     |
| is-sensitive | true   false<br><br>If true, specifies that the attribute values referenced by the <code>&lt;allow-attr&gt;</code> element contain sensitive data that should be suppressed in trace information.  | false         |

## Content Declaration

Empty

## Parent Elements

| Element                  | Description                  |
|--------------------------|------------------------------|
| <code>allow-class</code> | Allow a class in the filter. |

# allow-class

Used to specify classes that are allowed in the event filter specified by the enclosing `<driver-filter>`.

## Example

See `<init-params>`.

## Allowed Content

| Element                 | Description                       |
|-------------------------|-----------------------------------|
| <code>allow-attr</code> | Allow an attribute in the filter. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. | #REQUIRED     |

## Content Rule

( `allow-attr` ) \*

## Parent Elements

| Element                    | Description  |
|----------------------------|--|
| <code>driver-filter</code> | Publication and Subscription class and attribute event filter. |

## app-name

Used to specify a class or attribute name in the application namespace.

### Example

See `<attr-name-map>`.

### Allowed Content

#PCDATA

### Attributes

None

### Content Rule

( #PCDATA )

### Parent Elements

| Element                 | Description             |
|-------------------------|-------------------------|
| <code>attr-name</code>  | Maps an attribute name. |
| <code>class-name</code> | Maps a class name.      |

# association

Used to specify the unique key of an application object that is the source of an event notification from the PublicationShim to Identity Manager, the target of a command sent from Identity Manager to the SubscriptionShim, or the base object of a **<query>** sent to the SubscriptionShim.

## Example

```
<association state="associated">
  {B43E7155-CDF9-d311-9846-0008C76B16C2}
</association>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| state     | not-associated   associated   disabled   migrate   pending   manual<br><br>Reserved: Should be ignored by the driver | #IMPLIED      |

## Content Rule

#PCDATA

## Parent Elements

| Element                      | Description  |
|------------------------------|--|
| <b>add</b>                   | Adds an object when an add event occurs.                               |
| <b>check-object-password</b> | Checks the password against an eDirectory object.                      |
| <b>delete</b>                | Deletes an object when a delete event occurs.                          |
| <b>instance</b>              | Current state of an instance of an object.                             |
| <b>modify</b>                | Modifies an object when a modify event occurs.                         |
| <b>modify-association</b>    | Modifies an association command.                                       |
| <b>modify-password</b>       | Modifies an object password when a modify event for a password occurs. |
| <b>move</b>                  | Moves an object when a move event occurs.                              |

| Element  | Description                                   |
|----------|---|
| parent   | The parent container of an object.            |
| query    | Query command.                                |
| query-ex | Query command with a result count limit.      |
| rename   | Renames an object when a rename event occurs. |
| sync     | Resynchronization or migrate event.           |



# attr

Used to specify the attribute values for the object specified by the enclosing **<instance>**. Each **<attr>** should contain at least one **<value>**.

## Example

See **<instance>**.

## Allowed Content

| Element      | Description          |
|--------------|----------------------|
| <b>value</b> | The attribute value. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| attr-name | CDATA<br><br>The name of the attribute.<br><br>The name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. The mapping rule uses the class name attribute of the enclosing command or event to determine which class to use for mapping the attribute name. | #REQUIRED     |

## Content Rule

( value \* )

## Parent Elements

| Element         | Description                                |
|-----------------|--|
| <b>instance</b> | Current state of an instance of an object. |

# attr-def

Used to specify a schema attribute for the class specified by the enclosing `<class-def>`.

## Example

See `<schema-def>`.

## Allowed Content

EMPTY

## Attributes

| Attribute      | Possible Values  | Default Value |
|----------------|--|---------------|
| asn1id         | CDATA<br><br>The ASN.1 Object ID of the attribute.   | #IMPLIED      |
| attr-name      | CDATA<br><br>The name of the attribute.  | #REQUIRED     |
| case-sensitive | true   false<br><br>Whether or not the attribute is case sensitive.  | false         |
| multi-valued   | true   false<br><br>Whether or not the attribute can hold more than one value  | true          |
| naming         | true   false<br><br>Whether or not the attribute can be used as part of the RDN of an object of the enclosing class. | false         |
| read-only      | true   false<br><br>Whether or not the attribute is read-only.   | false         |
| required       | true   false<br><br>Whether or not the attribute is required by an object of the enclosing class.                    | false         |

| Attribute                       | Possible Values   | Default Value |
|---------------------------------|---|---------------|
| type                            | string   teleNumber   int   state  <br>counter   dn   interval   octet   time<br>  structured | string        |
| The data type of the attribute. |   |               |

## Content Declaration

Empty

## Parent Elements

| Element          | Description              |
|------------------|--------------------------|
| <b>class-def</b> | Schema class definition. |

# attr-name

Used to specify a mapping between an attribute name in the eDirectory namespace and the application namespace.

## Example

See `<attr-name-map>`.

## Allowed Content

| Element               | Description  |
|-----------------------|--|
| <code>nds-name</code> | Name in the eDirectory namespace. The names specified must be unique for the given class.  |
| <code>app-name</code> | Name in the application namespace. The names specified must be unique for the given class. |

## Attributes

| Attribute               | Possible Values   | Default Value |
|-------------------------|---|---------------|
| <code>class-name</code> | CDATA<br><br>The name of the class that this attribute name mapping is for in the eDirectory namespace. If missing or blank then mapping is considered generic and applies to all classes that don't have a class-specific mapping. | #IMPLIED      |

## Content Rule

( `nds-name` , `app-name` )

## Parent Elements

| Element                    | Description                                    |
|----------------------------|--|
| <code>attr-name-map</code> | Top-level element for Schema Mapping policies. |

# attr-name-map

The top-level (document) element for Schema Mapping policies. Schema Mapping policies are stored in the DirXML-XmlData attribute of a DirXML-Rule object that is pointed to by the DirXML-MappingRule attribute of a DirXML-Driver object.

## Remarks

<attr-name-map> contains <attr-name> and <class-name> elements that specify a one-to-one mapping between class and attribute names in eDirectory and the application namespace. Schema Mapping policies are applied to map from the eDirectory namespace to the application namespace whenever XML is sent or returned from Identity Manager to the driver and before the Output transform is applied.

Schema Mapping policies are applied to map from the application namespace to the eDirectory namespace whenever XML is sent or returned from driver to Identity Manager after the Input Transform policy is applied.

Schema Mapping policies try to map the <class-name> and <attr-name> attributes of all elements in the document. The <class-name> to map an attribute name is found by looking the nearest ancestor element with a <class-name> attribute.

## Example

```
<attr-name-map>
  <!-- map eDirectory class User application class inetOrgPerson
-->
    <class-name>
      <nds-name>User</nds-name>
      <app-name>inetOrgPerson</app-name>
    </class-name>
    <!-- map NDS attribute Given Name to application attribute givenName for
class User -->
      <attr-name class-name="User">
        <nds-name>Given Name</nds-name>
        <app-name>givenName</app-name>
      </attr-name>
    <!-- map NDS attribute Surname to application attribute sn for all classes
-->
      <!-- that don't have a class-specific mapping -->
      <attr-name>
        <nds-name>Surname</nds-name>
        <app-name>sn</app-name>
      </attr-name>
</attr-name-map>
```

## Allowed Content

| Element   | Description             |
|-----------|-------------------------|
| attr-name | Maps an attribute name. |

| Element                 | Description        |
|-------------------------|--------------------|
| <code>class-name</code> | Maps a class name. |

## Attributes

None

## Content Rule

( attr-name | class-name ) \*

## Parent Elements

None

# authentication-info

Used to specify the parameters needed for the driver to connect to and authenticate to an application server.

## Example

See `<init-params>`.

## Allowed Content

| Element               | Description                  |
|-----------------------|------------------------------|
| <code>server</code>   | The authentication server.   |
| <code>user</code>     | The authentication username. |
| <code>password</code> | The authentication password. |

## Attributes

None

## Content Rule

( `server ?` , `user ?` , `password ?` )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>init-params</code> | Initialization parameters for the DriverShim, SubscriptionShim, or PublicationShim. |

# check-object-password

Used to validate a password against an eDirectory object. A **<status>** result is returned indicating success or failure.

## Remarks

An **<association>** element, a dest-dn attribute, or a dest-entry-id attribute is used to specify the eDirectory object against which the password is to be checked.

If the eDirectory object's Login Disabled attribute is set to true, then the **<status>** indicates an error even if the password is correct.

## Example

```
<check-object-password dest-dn="container\object">  
  abdc1234  
</check-object-password>
```

## Allowed Content

| Element               | Description                           |
|-----------------------|---------------------------------------|
| <b>association</b>    | Unique key of the application object. |
| <b>password</b>       | The authentication password.          |
| <b>operation-data</b> | Operation additional custom data.     |

## Attributes

| Attribute   | Possible Values  | Default Value |
|---|--|---------------|
| dest-dn   | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver. | #IMPLIED      |
| dest-entry-id   | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.           | #IMPLIED      |
| event-id CDATA<br>An identifier used to tag the results of an event or command. | CDATA<br><br>An identifier used to tag the results of an event or command.                 | #IMPLIED      |



## Content Rule

( association ? , password , operation-data ? )

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# check-password

Used to validate a password against the eDirectory driver object. A **<status>** result is returned indicating success or failure.

## Example

```
<check-password>abdc1234</check-password>
```

## Allowed Content

#PCDATA

| Element               | Description                                |
|-----------------------|--|
| <b>operation-data</b> | The operation adds additional custom data. |

## Attributes

None

## Content Rule

( #PCDATA | operation-data ) \*

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# class-def

Used to specify a schema class the enclosing `<schema-def>`.

## Example

See `<schema-def>`.

## Allowed Content

| Element               | Description                  |
|-----------------------|------------------------------|
| <code>attr-def</code> | Schema attribute definition. |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| asn1id     | CDATA<br>The ASN.1 Object ID of the class.   | #IMPLIED      |
| class-name | CDATA<br>The name of the schema class.   | #REQUIRED     |
| container  | true   false<br>Whether or not an object of this class can be a container for other objects. | false         |

## Content Rule

( `attr-def` ) \*

## Parent Elements

| Element                 | Description        |
|-------------------------|--------------------|
| <code>schema-def</code> | Schema definition. |

# class-name

Used to specify a mapping between a class name in the eDirectory namespace and the application namespace.

## Example

See <attr-name-map>.

## Allowed Content

| Element  | Description  |
|----------|--|
| nds-name | Name in the eDirectory namespace. The names specified must be unique to this <class-name>. |
| app-name | Name in the eDirectory namespace. The names specified must be unique to this <class-name>. |

## Attributes

None

## Content Rule

( nds-name , app-name )

## Parent Elements

| Element       | Description                                    |
|---------------|--|
| attr-name-map | Top-level element for Schema Mapping policies. |

# component

Used to specify an individual field of the enclosing <value> if the data type of the value is structured.

## Example

See <value>.

## Allowed Content

#PCDATA

## Attributes

| Attribute       | Possible Values  | Default Value |
|-----------------|--|---------------|
| association-ref | CDATA<br><br>The association value (application object unique key) of the object being referenced by this component. This is required on all components that refer to other objects when the component is part of a notification event from the driver. This exists on all components that refer to other objects when the component is part of a command from Identity Manager if the referenced object has an established association in eDirectory. | #IMPLIED      |
| name            | CDATA<br><br>The name of the component. This is specific to individual attribute syntaxes. See <value>.  | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| value   | The attribute value. |

# config-object

Used to specify objects and attributes where additional configuration information is obtained.

## Remarks

During driver startup, the contained `<query>` is processed and the resulting `<instance>` element replaces the `<config-object>` in the `<init-params>` passed to the `DriverShim.init()`, `SubscriptionShim.init()`, and `PublicationShim.init()` methods.

## Example

See `<init-params>`.

## Allowed Content

| Element            | Description    |
|--------------------|----------------|
| <code>query</code> | Query command. |

## Attributes

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| display-name | CDATA<br><br>The name to display in the interface generated by ConsoleOne®. | #IMPLIED      |

## Content Rule

( query )

## Parent Elements

None

# contact

Used to specify the point of contact for the creator of the enclosing document.

## Example

See <nds>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

#PCDATA

## Parent Elements

| Element | Description                            |
|---------|--|
| source  | The source or creator of the document. |

# copy-attr

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<token-op-attr>` instead.

## Remarks

`<copy-attr>` is used as a token to specify a string replacement in the distinguished name generated by the enclosing `<placement>`.

The replacement string is generated by copying the first value for the attribute specified by `attr-name` from the `<add>` event that is being processed. If the attribute does not exist, then the enclosing `<placement-rule>` is skipped. Structured attribute types are not supported.

## Example

See `<placement-rules>`.

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| attr-name | CDATA<br><br>The name of the attribute.<br><br>The name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. The mapping rule uses the class name attribute of the enclosing command or event to determine which class to use for mapping the attribute name. | #REQUIRED     |

## Content Declaration

Empty



## Parent Elements

| Element                   | Description  |
|---------------------------|--|
| <a href="#">placement</a> | Object placement specifier. Deprecated as of Identity Manager 2.0. |

# copy-name

Deprecated as of Identity Manager 2.0. Use DirXMLScript <token-src-dn> instead.

## Remarks

<copy-name> is used as a token to specify a string replacement in the distinguished name generated by the enclosing <placement>.

The replacement string is generated by copying the unqualified portion of the leaf-most component of the src-dn attribute from the <add> event that is being processed. If the src-dn does not exist, then the enclosing <placement-rule> is skipped.

## Example

See <placement-rules>.

## Allowed Content

EMPTY

## Attributes

None

## Content Declaration

Empty

## Parent Elements

| Element   | Description  |
|-----------|--|
| placement | Object placement specifier. Deprecated as of Identity Manager 2.0. |

# copy-path

Deprecated as of Identity Manager 2.0. Use DirXMLScript <token-src-dn> instead.

## Remarks

<copy-path> is used as a token to specify a string replacement in the distinguished name generated by the enclosing <placement>.

The replacement string is generated by copying the src-dn attribute from the <add> event that is being processed. A conversion from the src-dn-format to the dest-dn-format of the enclosing <placement-rules> is performed if the formats are different. Conversion from a typeless (unqualified) format to a typed (qualified) format is unsupported unless the source is eDirectory.

## Example

See <placement-rules>.

## Allowed Content

EMPTY

## Attributes

None

## Content Declaration

Empty

## Parent Elements

| Element   | Description  |
|-----------|--|
| placement | Object placement specifier. Deprecated as of Identity Manager 2.0. |

# copy-path-suffix

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<token-unmatched-src-dn>` instead.

## Remarks

`<copy-path-suffix>` is used as a token to specify a string replacement in the distinguished name generated by the enclosing `<placement>`.

The replacement string is generated by copying src-dn attribute from the `<add>` event that is being processed, and then stripping away the portion of the src-dn matched by a `<match-path>` in the enclosing `<placement-rule>`. If no `<match-path>` was specified then the whole src-dn is copied. A conversion from the src-dn-format to the dest-dn-format of the enclosing `<placement-rules>` is performed if the formats are different. Conversion from a typeless (unqualified) format to a typed (qualified) format is unsupported unless the source is eDirectory.

## Example

See `<placement-rules>`.

## Allowed Content

EMPTY

## Attributes

None

## Content Declaration

Empty

## Parent Elements

| Element                | Description  |
|------------------------|--|
| <code>placement</code> | Object placement specifier. Deprecated as of Identity Manager 2.0. |

# create-rule

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<rule>` instead.

## Remarks

`<create-rule>` is used to specify the criteria for creating a new object as a result of an `<add>` event.

When a `<create-rule>` is evaluated, it first checks whether or not this is a suitable rule for the `<add>` event in question. It does this by checking if a class name is specified by the rule. If so, the rule is only suitable if the class name matches the class name on the event. It then checks if any `<match-attr>` criteria are specified by the rule. If so, the rule is only suitable if the `<add>` contains all the attribute values required by the `<match-attr>`. If a rule is determined to not be suitable, it is skipped.

When a suitable rule is found, the `<add>` is evaluated to see if it has a value for all of the `<required-attr>` that do not contain a default value. If not, the `<add>` is vetoed; otherwise, it is allowed. Then any required attributes with default values that were missing from the `<add>` are filled in. If the write-back attribute of the `<required-attr>` element is set, the missing values are also written back to the source object. The template-dn attribute is filled in if a `<template>` is specified.

## Example

See `<create-rules>`.

## Allowed Content

| Element                 | Description  |
|-------------------------|--|
| <code>match-attr</code> | Matches an attribute. Deprecated as of Identity Manager 2.0. |
| <code>read-attr</code>  | Required attribute. Deprecated as of Identity Manager 2.0.   |
| <code>template</code>   | Specifies a template. Deprecated as of Identity Manager 2.0. |

## Attributes

| Attribute               | Possible Values  | Default Value |
|-------------------------|--|---------------|
| <code>class-name</code> | CDATA<br><br>The name of the base class of the objects this rule applies to in the eDirectory namespace. If empty or not present, then this rule applies to all base classes | #IMPLIED      |

| Attribute   | Possible Values   | Default Value |
|-------------|---|---------------|
| description | CDATA<br><br>Description of this rule, primarily for use in ConsoleOne. | #IMPLIED      |

## Content Rule

( match-attr \* , required-attr \* , template ? )

## Parent Elements

| Element             | Description  |
|---------------------|--|
| <b>create-rules</b> | Top-level element for object creation rules.<br>Deprecated as of Identity Manager 2.0. |

# create-rules

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<policy>` instead.

## Remarks

`<create-rules>` is the top-level (document) element for object creation rules. Object creation rules are stored in the DirXML-XmlData attribute of a DirXML-Rule object that is pointed to by the DirXML-CreateRule attribute of a DirXML-Subscriber or DirXML-Publisher object.

In the Subscriber channel, the source is eDirectory, and the destination is the application. In the Publisher channel, the source is the application and the destination is eDirectory.

Object creation rules are used to determine whether or not to create a new object in the destination as a result of an `<add>` event in the source. (Identity Manager automatically converts `<modify>` into `<add>` for events from unassociated objects). Object creation rules are applied only after any existing Matching rules are applied and fail to find a matching object in the destination.

`<create-rules>` contains 0 or more `<create-rule>` elements. The creation rule processor evaluates each `<create-rule>` in order until a suitable rule is found. That rule then vetoes or allows the object creation and fills in any default attributes and templates specified. If no suitable `<create-rule>` is found, then the object creation is allowed.

## Example

```
<create-rules>
  <!-- For all Users in the Defense organization require Given Name-->
  <!-- Surname, and Security Clearance. Create using the -->
  <!-- templates\Secure User template -->
  <create-rule class-name="User">
    <match-attr attr-name="OU">
      <value>Defense</value>
    </match-attr>
    <required-attr attr-name="Given Name"/>
    <required-attr attr-name="Surname"/>
    <required-attr attr-name="Security Clearance"/>
    <template template-dn="templates\Secure User"/>
  </create-rule>
  <!-- For all other Users require Given Name and Surname. -->
  <!-- Default the value of Security Clearance to None -->
  <!-- Don't use a template for creation -->
  <create-rule class-name="User">
    <required-attr attr-name="Given Name"/>
    <required-attr attr-name="Surname"/>
    <required-attr attr-name="Security Clearance">
      <value>None</value>
    </required-attr>
  </create-rule>
</create-rules>
```

## Allowed Content

| Element                  | Description  |
|--------------------------|--|
| <code>create-rule</code> | Object creation rule. Deprecated as of Identity Manager 2.0. |

## Attributes

None

## Content Rule

( `create-rule` ) \*

## Parent Elements

None



# delete

Used as an event notification from the PublicationShim to Identity Manager when an object is deleted in the application. When used as a notification, an **<association>** is required. Also used as a command from Identity Manager to the SubscriptionShim to delete an object in the application. When used as a command, an **<association>** is required and is the unique key of the object to delete.

## Remarks

A response to **<delete>** should be a **<status>** indicating whether or not the **<delete>** was processed successfully.

## Example

```
<delete class-name="User" src-dn="\Sam">  
    <association>1012</association>  
</delete>
```

## Allowed Content

| Element        | Description                                |
|----------------|--|
| association    | Unique key of the application object.      |
| operation-data | The operation adds additional custom data. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. | #IMPLIED      |
| dest-dn    | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.<br><br>Should be left empty for event notifications.   | #IMPLIED      |

| Attribute        | Possible Values   | Default Value |
|------------------|---|---------------|
| dest-entry-id    | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Should be left empty for event notifications.                     | #IMPLIED      |
| event-id         | CDATA<br><br>An identifier used to tag the results of an event or command.  | #IMPLIED      |
| qualified-src-dn | CDATA<br><br>The qualified version of src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |
| src-dn           | CDATA<br><br>The distinguished name of source object that generated the event in the namespace of the sender.   | #IMPLIED      |
| src-entry-id     | CDATA<br><br>The entry ID of the source object that generated the event in the namespace of the sender.<br><br>Reserved. Should be ignored by the driver. | #IMPLIED      |
| timestamp        | CDATA<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |

## Content Rule

( association ? , operation-data ? )

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# driver-config

Used to specify driver-specific configuration options. It is the top-level element in the XML stored in the DirXML-ShimConfigInfo attribute of the DirXML-Driver object in eDirectory.

## Remarks

The enclosed `<driver-options>`, `<subscriber-options>`, and `<publisher-options>` can each contain any number of `<config-object>` and driver-defined elements. The driver-defined elements might each contain text data.

Each driver-defined element can have a type attribute. The type attribute can specify that the element refers to a named password by assigning the value password-ref to the attribute. A named password reference is replaced at runtime with the actual value of a named password set using the Identity Manager administration facilities.

In the Identity Manager administration interface, each driver defined element is displayed as an edit control that can edit the content of the element. Each `<config-object>` is displayed as a single valued dn control that allows the selection of a dn to fill in the dest-dn of enclosed `<query>`. Each control is labeled with the value of the display-name attribute if it exists or with the tag name if it does not exist.

## Example

```
<driver-config name="Netscape DirXML Driver">
  <driver-options>
    <display-method display-name="Debug Output (0-none,
1-Window, 2-DSTrace)">1</display-method>
  </driver-options>
  <subscriber-options>
    <config-object display-name="Super driver configuration
data">
      <query dest-dn="novell/Driver Set/Super
Driver/Config Object" scope="entry" event-id="config1">
        <read-attr attr-name="Some Attribute"/>
        <read-attr attr-name="XmlData" type="xml"/>
      </query>
    </config-object>
  </subscriber-options>
  <publisher-options>
    <pollRate display-name="Poll rate in seconds">5</pollRate>
    <changeLogSuffix display-name="Netscape changelog
suffix">cn=changelog</changeLogSuffix>
    <changeLogBegin display-name="Starting changelog (1-First,2-New, 3-
Continue)">2</changeLogBegin>
  </publisher-options>
</driver-config>
```

## Allowed Content

| Element                            | Description   |
|------------------------------------|---|
| <a href="#">driver-options</a>     | Driver-specific DriverShim configuration options.       |
| <a href="#">subscriber-options</a> | Driver-specific SubscriptionShim configuration options. |
| <a href="#">publisher-options</a>  | Driver-specific PublicationShim configuration options.  |

## Attributes

| Attribute | Possible Values                                      | Default Value |
|-----------|--|---------------|
| name      | CDATA<br><br>Human readable name of the driver shim. | #IMPLIED      |

## Content Rule

( [driver-options](#) ? , [subscriber-options](#) ? , [publisher-options](#) ? )

## Parent Elements

None

# driver-filter

Used to specify the event filter that is being used by a particular channel. It is generated from the DirXML-DriverFilter attribute on the DirXML-Subscriber or DirXML-Publisher object.

## Example

See <init-params>.

## Allowed Content

| Element     | Description                   |
|-------------|-------------------------------|
| allow-class | Allows a class in the filter. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| type      | publisher   subscriber<br>Specifies the channel that the filter is for. | #IMPLIED      |

## Content Rule

( allow-class ) \*

## Parent Elements

| Element     | Description   |
|-------------|---|
| init-params | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |

# driver-options

Used to specify driver-specific configuration options. It comes from the DirXML-ShimConfigInfo attribute of the DirXML-Driver object in eDirectory.

## Example

See <driver-config>.

## Allowed Content

ANY

## Attributes

None

## Content Rule

ANY

## Parent Elements

| Element       | Description   |
|---------------|---|
| driver-config | Driver specific DriverShim configuration options.                                 |
| init-params   | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |

## driver-state

Used specify driver specific state information.

### Example

See `<init-params>`.

### Allowed Content

ANY

### Attributes

None

### Content Rule

ANY

### Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>init-params</code> | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |

# get-named-password

Used to retrieve a named password for a driver. A **<status>** result is returned indicating success or failure. If the status is success, then a **<password>** element is also returned containing the password value. The content of **<get-namedpassword>** is the name or key of the password that is retrieved.

## Example

```
<get-named-password event-id="gnp37">  
  web-password  
</get-named-password>
```

## Allowed Content

#PCDATA

| Element        | Description                                |
|----------------|--|
| operation-data | The operation adds additional custom data. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| event-id  | CDATA<br><br>An identifier used to tag the results of an event or command. | #IMPLIED      |

## Content Rule

( #PCDATA | operation-data ) \*

## Parent Elements

| Element | Description               |
|---------|---------------------------|
| input   | Input events or commands. |



# init-params

Used to specify initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim.

## Remarks

<init-params> is also included in any <output> or <input> from the driver to Identity Manager, which instructs Identity Manager to store the contents of the enclosed <driver-state>, <subscriber-state>, and <publisher-state> into the DirXML-DriverStorage attribute of the DirXML-Driver object in eDirectory. The states are included in the <init-params> sent to the corresponding init() function when a driver, subscriber, or publisher is started.

## Example

```
<!-- for DriverShim.init() -->
<init-params src-dn="\MY_TREE\MyOrg\MyDriverSet\MyDriver">
  <authentication-info>
    <server>localhost</server>
    <user>Fred</user>
    <password>foobar</password>
  </authentication-info>
  <driver-options>
    <!-- some driver defined driver options -->
  </driver-options>
  <driver-state>
    <!-- some driver defined driver state -->
  </driver-state>
</init-params>
<!-- for SubscriptionShim.init() -->
<init-params src-dn="\MY_TREE\MyOrg\MyDriverSet\MyDriver\Subscriber">
  <authentication-info>
    <server>localhost</server>
    <user>Fred</user>
    <password>foobar</password>
  </authentication-info>
  <driver-filter type="subscriber">
    <allow-class class-name="User">
      <allow-attr attr-name="Telephone Number"/>
      <allow-attr attr-name="CN"/>
      <allow-attr attr-name="Surname"/>
      <allow-attr attr-name="Given Name"/>
      <allow-attr attr-name="Description"/>
      <allow-attr attr-name="Title"/>
      <allow-attr attr-name="Postal Address"/>
      <allow-attr attr-name="GUID"/>
      <allow-attr attr-name="Full Name"/>
    </allow-class>
    <allow-class class-name="Organizational Unit">
      <allow-attr attr-name="OU"/>
    </allow-class>
    <allow-class class-name="Organizational">
      <allow-attr attr-name="O"/>
    </allow-class>
  </driver-filter>
  <subscriber-options>
```

```

        <!-- some driver defined subscriber options -->
    </subscriber-options>
    <subscriber-state>
        <!-- some driver defined subscriber state -->
    </subscriber-state>
</init-params>
<!-- for PublicationShim.init() -->
<init-params src-dn="\MY_TREE\MyOrg\MyDriverSet\MyDriver\Publisher">
    <authentication-info>
        <server>localhost</server>
        <user>Fred</user>
        <password>foobar</password>
    </authentication-info>
    <driver-filter type="publisher">
        <allow-class class-name="User">
            <allow-attr attr-name="Telephone Number"/>
            <allow-attr attr-name="CN"/>
            <allow-attr attr-name="Surname"/>
            <allow-attr attr-name="Given Name"/>
            <allow-attr attr-name="Description"/>
            <allow-attr attr-name="Title"/>
            <allow-attr attr-name="Postal Address"/>
            <allow-attr attr-name="GUID"/>
            <allow-attr attr-name="Full Name"/>
        </allow-class>
        <allow-class class-name="Organizational Unit">
            <allow-attr attr-name="OU"/>
        </allow-class>
        <allow-class class-name="Organizational">
            <allow-attr attr-name="O"/>
        </allow-class>
    </driver-filter>
    <publisher-options>
        <!-- some driver defined publisher options -->
    </publisher-options>
    <publisher-state>
        <!-- some driver defined publisher state -->
    </publisher-state>
</init-params>
<!-- for DriverShim.getSchema() -->
<init-params>
    <authentication-info>
        <server>localhost</server>
        <user>Fred</user>
        <password>foobar</password>
    </authentication-info>
    <driver-filter type="subscriber">
        <allow-class class-name="User">
            <allow-attr attr-name="Telephone Number"/>
            <allow-attr attr-name="CN"/>
            <allow-attr attr-name="Surname"/>
            <allow-attr attr-name="Given Name"/>
            <allow-attr attr-name="Description"/>
            <allow-attr attr-name="Title"/>
            <allow-attr attr-name="Postal Address"/>
            <allow-attr attr-name="GUID"/>
            <allow-attr attr-name="Full Name"/>
        </allow-class>
        <allow-class class-name="Organizational Unit">

```

```

        <allow-attr attr-name="OU"/>
    </allow-class>
    <allow-class class-name="Organizational">
        <allow-attr attr-name="O"/>
    </allow-class>
</driver-filter>
<driver-filter type="publisher">
    <allow-class class-name="User">
        <allow-attr attr-name="Telephone Number"/>
        <allow-attr attr-name="CN"/>
        <allow-attr attr-name="Surname"/>
        <allow-attr attr-name="Given Name"/>
        <allow-attr attr-name="Description"/>
        <allow-attr attr-name="Title"/>
        <allow-attr attr-name="Postal Address"/>
        <allow-attr attr-name="GUID"/>
        <allow-attr attr-name="Full Name"/>
    </allow-class>
    <allow-class class-name="Organizational Unit">
        <allow-attr attr-name="OU"/>
    </allow-class>
    <allow-class class-name="Organizational">
        <allow-attr attr-name="O"/>
    </allow-class>
</driver-filter>
<driver-options>
    <!-- some driver defined driver options -->
</driver-options>
<subscriber-options>
    <!-- some driver defined subscriber options -->
</subscriber-options>
<publisher-options>
    <!-- some driver defined publisher options -->
</publisher-options>
<driver-state>
    <!-- some driver defined driver state -->
</driver-state>
<subscriber-state>
    <!-- some driver defined subscriber state -->
</subscriber-state>
<publisher-state>
    <!-- some driver defined publisher state -->
</publisher-state>
</init-params>

```

## Allowed Content

| Element                    | Description   |
|----------------------------|---|
| <b>authentication-info</b> | Information for connecting and authenticating to the application. |
| <b>driver-filter</b>       | Publication and Subscription class and attribute event filter.    |
| <b>driver-options</b>      | Driver-specific DriverShim configuration options.                 |

| Element                   | Description   |
|---------------------------|---|
| <b>subscriber-options</b> | Driver-specific SubscriptionShim configuration options. |
| <b>publisher-options</b>  | Driver-specific PublicationShim configuration options.  |
| <b>driver-state</b>       | Driver-specific state information.                      |
| <b>subscriber-state</b>   | Driver SubscriptionShim state information.              |
| <b>publisher-state</b>    | Driver PublicationShim state information.               |
| <b>operation-data</b>     | The operation adds additional custom data.              |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| src-dn    | CDATA<br><br>The distinguished name of DirXML-Driver, DirXML-Publisher, or DirXML-Subscriber. | #IMPLIED      |

## Content Rule

( authentication-info ? , driver-filter ? , driver-options ? , subscriber-options ? , publisher-options ? , driver-state ? , subscriber-state ? , publisher-state ? , operation-data ? )

## Parent Elements

| Element       | Description                    |
|---------------|--------------------------------|
| <b>input</b>  | Input events or commands.      |
| <b>output</b> | Results of events or commands. |

# input

Used to encapsulate events or commands sent as input to a driver or Identity Manager. All **<nds>** documents sent as a parameter to Identity Manager or driver interface method should contain exactly one **<input>**.

## Example

See **<nds>**.

## Allowed Content

| Element                      | Description   |
|------------------------------|---|
| <b>add</b>                   | Adds an object when an add event occurs.  |
| <b>modify</b>                | Modifies an object when a modify event occurs.                                    |
| <b>delete</b>                | Deletes an object when a delete event occurs.                                     |
| <b>rename</b>                | Renames an object when a rename event occurs.                                     |
| <b>move</b>                  | Moves an object when a move event occurs  |
| <b>query</b>                 | Query command.  |
| <b>query-ex</b>              | Query command with a result count limit.  |
| <b>query-schema</b>          | Query schema command.   |
| <b>add-association</b>       | Adds association command.   |
| <b>modify-association</b>    | Modifies an association command.  |
| <b>remove-association</b>    | Removes an association command.   |
| <b>init-params</b>           | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |
| <b>status</b>                | Status of the processing of a command or event.                                   |
| <b>check-password</b>        | Checks password against an eDirectory driver object.                              |
| <b>modify-password</b>       | Modifies an object password when a modify event for a password occurs.            |
| <b>check-object-password</b> | Checks password against an eDirectory object.                                     |
| <b>sync</b>                  | Resynchronization or migrate event.   |
| <b>get-named-password</b>    | Retrieves a named password for a driver.  |

## Attributes

None

## Content Rule

( add | modify | delete | rename | move | query | query-ex | query-schema | add-association | modify-association | remove-association | init-params | status | check-password | modify-password | check-object-password | sync | get-named-password ) \*

## Parent Elements

| Element    | Description  |
|------------|--|
| <b>nds</b> | Top-level element for all Identity Manager and Driver communication. |

# instance

Used to represent an object in eDirectory or the application as part of the response to a **<query>** command or a **<query-ex>** command. **<instance>** does not necessarily represent the complete state of object, but just the information requested by the **<query>** or **<query-ex>**. When returned from a driver, an **<association>** is required.

## Example

```
<instance class-name="User" src-dn="\Users\Samuel">
  <association>1012</association>
  <attr attr-name="Surname">
    <value>Jones</value>
  </attr>
  <attr attr-name="cn">
    <value>Samuel</value>
  </attr>
  <attr attr-name="Given Name">
    <value>Samuel</value>
  </attr>
  <attr attr-name="Telephone Number">
    <value>555-1212</value>
    <value>555-1764</value>
  </attr>
</instance>
```

## Allowed Content

| Element               | Description                                |
|-----------------------|--|
| <b>association</b>    | Unique key of the application object.      |
| <b>parent</b>         | The parent or container of an object.      |
| <b>attr</b>           | Current state of an attribute.             |
| <b>operation-data</b> | The operation adds additional custom data. |

## Attributes

| Attribute        | Possible Values   | Default Value |
|------------------|---|---------------|
| class-name       | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. | #REQUIRED     |
| event-id         | CDATA<br><br>An identifier used to tag the results of an event or command.  | #IMPLIED      |
| qualified-src-dn | CDATA<br><br>The qualified version of src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |
| src-dn           | CDATA<br><br>The distinguished name of the source object that generated the event in the namespace of the sender.   | #IMPLIED      |
| src-entry-id     | CDATA<br><br>The entry ID of the source object that generated the event in the namespace of the sender.<br><br>Reserved: Should be ignored by the driver.   | #IMPLIED      |

## Content Rule

( association ? , parent ? , attr \* , operation-data ? )

## Parent Elements

| Element       | Description                    |
|---------------|--------------------------------|
| <b>output</b> | Results of events or commands. |



# match-attr

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<if-op-attr>` for an object creation and Placement policy or `<do-find-matching-object>` and `<arg-match-attr>` for an object Matching policy.

## Remarks

`<match-attr>` is used to specify:

- ♦ Rule selection criteria for the enclosing `<create-rule>` or `<placement-rule>`. When used as such, it must contain at least one `<value>`.
- ♦ Object selection criteria for the enclosing `<matching-rule>`. When used as such, it must not contain a `<value>`.

## Example

See `<create-rules>`.

## Allowed Content

| Element            | Description          |
|--------------------|----------------------|
| <code>value</code> | The attribute value. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| attr-name | CDATA<br><br>The name of the required attribute in the eDirectory namespace. | #REQUIRED     |

## Content Rule

( value ) \*

## Parent Elements

| Element                    | Description  |
|----------------------------|--|
| <code>create-rule</code>   | Object creation rule. Deprecated as of Identity Manager 2.0. |
| <code>matching-rule</code> | Object matching rule. Deprecated as of Identity Manager 2.0. |

| Element                     | Description   |
|-----------------------------|---|
| <code>placement-rule</code> | Object placement rule. Deprecated as of Identity Manager 2.0. |

# match-class

Deprecated as of Identity Manager 2.0. Use DirXMLScript <if-object-class> instead.

## Remarks

<match-class> is used to specify rule selection criteria for the enclosing <matching-rule> or <placement-rule>.

## Example

See <matching-rules> and <placement-rules>.

## Allowed Content

EMPTY

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| class-name | CDATA<br><br>The name of the base class in the eDirectory namespace. | #REQUIRED     |

## Content Declaration

Empty

## Parent Elements

| Element        | Description  |
|----------------|--|
| matching-rule  | Object matching rule. Deprecated as of Identity Manager 2.0. |
| placement-rule | Object matching rule. Deprecated as of Identity Manager 2.0. |

# match-path

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<if-src-dn>` for object placement policy or `<do-find-matching-object>` and `<arg-dn>` for object matching policy.

## Remarks

`<match-path>` is used to specify:

- ♦ Rule selection criteria for the enclosing `<placement-rule>`. When used as such, the `src-dn` attribute of the source `<add>` event is compared with prefix and is considered a match if the `src-dn` is in the subtree whose root is prefix. The namespace of the path is the same as the event source.
- ♦ Object selection criteria for the enclosing `<matching-rule>`. When used as such, prefix is used as the `dest-dn` for the `<query>` generated by the enclosing rule. The namespace of the path is the same as the event destination.

When the namespace of the path is eDirectory, the format is slash format, for example, `\treename\container\...\leaf`. If the leading `\` is omitted, the path is assumed to be relative to the tree root.

When the namespace of the path is the application namespace, the format of the path is application dependent and should be documented by the driver writer.

## Example

See `<matching-rules>` and `<placement-rules>`.

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| prefix    | CDATA<br><br>The root-most portion of the path or distinguished name to match. | #REQUIRED     |

## Content Declaration

EMPTY

## Parent Elements

| Element                     | Description  |
|-----------------------------|--|
| <code>matching-rule</code>  | Object matching rule. Deprecated as of Identity Manager 2.0. |
| <code>placement-rule</code> | Object matching rule. Deprecated as of Identity Manager 2.0. |

# matching-rule

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<rule>` and `<do-find-matching-object>` instead.

## Remarks

`<matching-rule>` is used to specify the criteria for finding a matching object for automatic association of a new object as a result of an `<add>` event.

When a `<matching-rule>` is evaluated, it first checks whether or not this is a suitable rule for the `<add>` event in question. It does this by checking if any `<match-class>` elements are specified by the rule. If so then the rule is only suitable if the class name on the event matches the class name on one of the `<match-class>` elements. It then checks if any `<modify-attr>` criteria are specified by the rule. If so, the rule is only suitable if the `<add>` contains an attribute value for each attribute specified by a `<match-attr>`. If a rule is determined to not be suitable, it is skipped.

When a suitable rule is found, a `<query>` is generated based on the criteria specified by the rule (`<match-attr>` and `<match-path>`), and the class name and attribute values specified by the `<add>`. This query is sent to the destination (eDirectory or driver). Any `<instance>` elements returned are considered matches.

## Example

See `<matching-rules>`.

## Allowed Content

| Element                  | Description  |
|--------------------------|--|
| <code>match-class</code> | Matches a class name. Deprecated as of Identity Manager 2.0. |
| <code>match-path</code>  | Matches a path. Deprecated as of Identity Manager 2.0.       |
| <code>match-attr</code>  | Matches an attribute. Deprecated as of Identity Manager 2.0. |

## Attributes

| Attribute                | Possible Values   | Default Value |
|--------------------------|---|---------------|
| <code>description</code> | CDATA<br>Description of this rule, primarily for use in ConsoleOne. | #IMPLIED      |

## Content Rule

( match-class \* , match-path ? , match-attr \* )

## Parent Elements

| Element                        | Description  |
|--------------------------------|--|
| <a href="#">matching-rules</a> | Top-level element for object matching rules.<br>Deprecated as of Identity Manager 2.0. |

# matching-rules

Deprecated as of Identity Manager 2.0 - use DirXMLScript **<policy>**.

## Remarks

**<matching-rules>** is the top level (document) element for object matching rules. Object matching rules are stored in the DirXML-XmlData attribute of a DirXML-Rule object that is pointed to by the DirXML-MatchingRule attribute of a DirXML-Subscriber or DirXML-Publisher object.

In the Subscriber channel, the source is eDirectory, and the destination is the application. In the Publisher channel the source is the application and the destination is eDirectory.

Object matching rules are used to try to find a matching object in the destination for an unassociated object in the source as a result of an **<add>** event in the source. (Note that DirXML automatically converts **<modify>** into **<add>** for events from unassociated objects). Object matching rules are applied before deciding if a new object should be created in the destination.

**<matching-rules>** contains 0 or more **<matching-rule>** elements. The matching rule processor evaluates each **<matching-rule>** in order until one or more matching objects in the destination are found.

If exactly one matching object is found, that object is automatically associated with the source object and Identity Manager attempts to reconcile any differences in the attribute values of the two objects as allowed by the Publisher and Subscriber filters.

If more than one matching object is found, an error is signaled and the object either has to be manually associated or the object matching rules has to be modified to be more specific.

If no matching objects are found, Identity Manager continues processing the event.

## Example

```
<matching-rules>
  <!-- for Users, first try to match on Surname, Given Name and
Location -->
  <matching-rule>
    <match-class class-name="User"/>
    <match-attr attr-name="Surname"/>
    <match-attr attr-name="Given Name"/>
    <match-attr attr-name="Location"/>
  </matching-rule>
  <!-- for Users, then try to match on Surname only in -->
  <!-- the o=novell subtree -->
  <matching-rule>
    <match-class class-name="User"/>
    <match-path prefix="o=novell"/>
    <match-attr attr-name="Surname"/>
  </matching-rule>
  <!-- for all classes try to match on CN only -->
  <matching-rule>
    <match-attr attr-name="CN"/>
  </matching-rule>
</matching-rules>
```



## Allowed Content

| Element                    | Description  |
|----------------------------|--|
| <code>matching-rule</code> | Object matching rule. Deprecated as of Identity Manager 2.0. |

## Attributes

None

## Content Rule

( `matching-rule` \* )

## Parent Elements

None

# modify

Used as an event notification from the PublicationShim to Identity Manager that an object is modified in the application. When it is used as a notification, an **<association>** is required. It is also used as a command from Identity Manager to the SubscriptionShim to modify an object in the application. When it is used as a command, an **<association>** is required and is the unique key of the object to modify.

## Remarks

**<add>** contains a **<modify-attr>** for each attribute modified.

A response to **<modify>** should be a **<status>** indicating whether or not the **<modify>** is processed successfully.

## Example

```
<modify class-name="User" src-dn="\Sam">
  <association>1012</association>
  <modify-attr attr-name="Given Name">
    <remove-all-values/>
    <add-value>
      <value>Samuel</value>
    </add-value>
  </modify-attr>
  <modify-attr attr-name="Telephone Number">
    <remove-value>
      <value>555-1212</value>
    </remove-value>
    <add-value>
      <value>555-1764</value>
      <value>555-1765</value>
    </add-value>
  </modify-attr>
</modify>
```

## Allowed Content

| Element               | Description                                |
|-----------------------|--|
| <b>association</b>    | Unique key of the application object.      |
| <b>modify-attr</b>    | Modifies an attribute                      |
| <b>operation-data</b> | The operation adds additional custom data. |

## Attributes

| Attribute        | Possible Values  | Default Value |
|------------------|--|---------------|
| class-name       | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace.<br><br>Required when used as a notification. | #IMPLIED      |
| dest-dn          | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |
| dest-entry-id    | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |
| event-id         | CDATA<br><br>An identifier used to tag the results of an event or command.   | #IMPLIED      |
| from-merge       | true   false<br><br>True if the command is the result of a merge   | false         |
| qualified-src-dn | CDATA<br><br>The qualified version of src-dn. Only used for describing objects from eDirectory.  | #IMPLIED      |
| src-dn           | CDATA<br><br>The distinguished name of the source object that generated the event in the namespace of the sender.  | #IMPLIED      |

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| src-entry-id | CDATA<br><br>The entry id of the source object that generated the event in the namespace of the sender.<br><br>Reserved. Should be ignored by the driver. | #IMPLIED      |
| timestamp    | CDATA<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |

## Content Rule

( association ? , modify-attr + , operation-data ? )

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# modify-association

Used to notify Identity Manager that an application object's unique key is modified. <modify-association> should be sent when the unique key is changed for an object that passes the event filter for either the SubscriptionShim or the PublicationShim. <modify-association> can be included in any <output> or <input> from the driver to Identity Manager.

## Example

```
<modify-association>
  <association>{BC3E7155-CDF9-d311-9846-0008C76B16C2}</association>
  <association>{CD3F7155-DE09-e311-9846-0008D76C16D2}</association>
</modify-association>
```

## Allowed Content

| Element        | Description                                |
|----------------|--|
| association    | Unique key of the application object.      |
| operation-data | The operation adds additional custom data. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| event-id  | CDATA<br>An identifier used to tag the results of an event or command. | #IMPLIED      |

## Content Rule

( association , association , operation-data ? )

## Parent Elements

| Element | Description                    |
|---------|--------------------------------|
| input   | Input events or commands.      |
| output  | Results of events or commands. |

# modify-attr

Used to specify the modified attribute values for a **<modify>** operation or event.

## Remarks

Each **<modify-attr>** should contain at least one **<add-value>**, **<remove-value>**, or **<remove-all-values>**.

The order of the above elements is significant.

## Example

See **<modify>**.

## Allowed Content

| Element                  | Description                             |
|--------------------------|---|
| <b>remove-value</b>      | Removes the specified attribute values. |
| <b>remove-all-values</b> | Removes all attribute values.           |
| <b>add-value</b>         | Adds values.                            |

## Attributes

| Attribute               | Possible Values   | Default Value |
|-------------------------|---|---------------|
| attr-name               | CDATA<br><br>The name of the attribute.<br><br>The name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. The Mapping policy uses the class name attribute of the enclosing command or event to determine which class to use for mapping the attribute name. | #REQUIRED     |
| enforce-password-policy | true   false<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |

## Content Rule

( remove-value | remove-all-values | add-value ) +

## Parent Elements

| Element       | Description                                    |
|---------------|--|
| <b>modify</b> | Modifies an object when a modify event occurs. |

# modify-password

Used as an event notification from the PublicationShim to Identity Manager that an object password is modified in the application. When used as a notification, an **<association>** is required. Also used as a command from Identity Manager to the SubscriptionShim to modify an object password in the application. When used as a command, an **<association>** is required and is the unique key of the object to modify.

## Remarks

When the target is eDirectory, and **<old-password>** is specified, the modifyPassword API is used to modify the password. If not specified, the GenerateKeyPair API is used. Using GenerateKeyPair might invalidate authentication credentials for any existing session authenticated as the target object.

When the target is the application, a driver might or might not implement this functionality, depending on the applicability to the application.

A response to **<modify-password>** should be a **<status>** indicating whether or not the **<modify-password>** is processed successfully.

## Example

```
<modify-password class-name="User" src-dn="\Sam">
  <association>1012</association>
  <password>mypassword</password>
</modify-password>
```

## Allowed Content

| Element               | Description                                |
|-----------------------|--|
| <b>association</b>    | Unique key of the application object.      |
| <b>old-password</b>   | The old authentication password.           |
| <b>password</b>       | The authentication password.               |
| <b>operation-data</b> | The operation adds additional custom data. |



## Attributes

| Attribute        | Possible Values  | Default Value |
|------------------|--|---------------|
| class-name       | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace.<br><br>Required when used as a notification. | #IMPLIED      |
| dest-dn          | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.   | #IMPLIED      |
| dest-entry-id    | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |
| event-id         | CDATA<br><br>An identifier used to tag the results of an event or command.   | #IMPLIED      |
| qualified-src-dn | CDATA<br><br>The qualified version of the src-dn. Only used for describing objects from eDirectory.  | #IMPLIED      |
| src-dn           | CDATA<br><br>The distinguished name of the source object that generated the event in the namespace of the sender.  | #IMPLIED      |
| src-entry-id     | CDATA<br><br>The entry ID of the source object that generated the event in the namespace of the sender.<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| timestamp | CDATA<br><br>Reserved. Should be ignored by the driver. | #IMPLIED      |

## Content Rule

( association ? , old-password ? , password , operation-data ? )

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# move

Used as an event notification from the PublicationShim to Identity Manager when an object is moved to a different container in the application. When used as a notification, an **<association>** is required. Also used as a command from Identity Manager to the SubscriptionShim to move an object to a different container in the application. When used as a command, an **<association>** is required and is the unique key of the object to move.

## Remarks

**<move>** contains a **<parent>** that specifies the new container. When used as a command, the **<parent>** can contain an **<association>**. If it does not contain an association, the driver should not attempt to move the object and should return a **<status>** level="warning".

A response to **<move>** should be a **<status>** indicating whether or not the **<move>** is processed successfully.

## Example

```
<move class-name="User" src-dn="\Users\Samuel" old-src-dn="\Samuel">
  <association>1012</association>
  <parent src-dn="\Users\">
    <association>1013</association>
  </parent>
</move>
```

## Allowed Content

| Element               | Description                               |
|-----------------------|---|
| <b>association</b>    | Unique key of the application object.     |
| <b>parent</b>         | The parent or container of an object.     |
| <b>operation-data</b> | The operation adds additional custom data |

## Attributes

| Attribute            | Possible Values   | Default Value |
|----------------------|---|---------------|
| class-name           | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. | #IMPLIED      |
| dest-dn              | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |
| dest-entry-id        | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |
| event-id             | CDATA<br><br>An identifier used to tag the results of an event or command.  | #IMPLIED      |
| old-src-dn           | CDATA<br><br>The original distinguished name of the source object that generated the event in the namespace of the sender.  | #IMPLIED      |
| qualified-old-src-dn | CDATA<br><br>The qualified version of the old-src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |
| qualified-src-dn     | CDATA<br><br>The qualified version of the src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| src-dn       | CDATA<br><br>The distinguished name of the source object that generated the event in the namespace of the sender.<br><br>The new distinguished name of the source object that generated the event in the namespace of the sender. | #IMPLIED      |
| src-entry-id | CDATA<br><br>The entry ID of the source object that generated the event in the namespace of the sender.<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |
| timestamp    | CDATA<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |

## Content Rule

( association ? , parent , operation-data ? )

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# nds

The top-level (document) element of all documents sent as a parameter to or returned from Identity Manager or driver interface method.

## Remarks

All <nds> documents sent as a parameter to Identity Manager or driver interface method should contain exactly one <input>.

All <nds> documents returned from Identity Manager or driver interface method should contain exactly one <output>.

## Example

DirXML sends:

```
<nds dtdversion="2.0">
  <source>
    <product version="2.0.0.0">DirXML</product>
    <contact>Novell, Inc.</contact>
  </source>
  <input>
    <modify class-name="User" event-id="0" qualified-src-
dn="\T=ATREE\O=Users\CN=Julia" src-dn="\ATREE\Users\Julia"
src-entry-id="33967">
      <association state="associated">
        {B43E7155-CDF9-d311-9846-0008C76B16C2}
      </association>
      <modify-attr attr-name="Surname">
        <add-value>
          <value type="string">Gulia</value>
        </add-value>
      </modify-attr>
    </modify>
  </input>
</nds>
```

Shim returns:

```
<nds dtdversion="2.0">
  <source>
    <product version="2.0.0.0">Some Application Driver</product>
    <contact>Nobody in particular</contact>
  </source>
  <output>
    <status event-id="0" level="success"/>
  </output>
</nds>
```

## Allowed Content

| Element | Description                            |
|---------|--|
| source  | The source or creator of the document. |
| input   | Input events or commands.              |
| output  | Results of events or commands.         |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| dtdversion | CDATA<br><br>Should be set to the major.minor version of Identity Manager that the driver is designed for. | #REQUIRED     |
| ndsversion | CDATA<br><br>Deprecated as of Identity Manager 2.0.  | #IMPLIED      |

## Content Rule

( source ? , ( input | output ) )

## Parent Elements

None

# nds-name

Used to specify a class or attribute name in the eDirectory namespace.

## Example

See <attr-name-map>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element    | Description             |
|------------|-------------------------|
| attr-name  | Maps an attribute name. |
| class-name | Maps a class name.      |



## new-name

Used to specify the new name for the object specified by the enclosing `<rename>` event or command.

### Example

See `<rename>`.

### Allowed Content

#PCDATA

### Attributes

None

### Content Rule

( #PCDATA )

### Parent Elements

| Element             | Description                                   |
|---------------------|---|
| <code>rename</code> | Renames an object when a rename event occurs. |

# old-password

Used to specify old password for the enclosing `<modify-password>`.

## Example

See `<modify-password>`.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element                      | Description  |
|------------------------------|--|
| <code>modify-password</code> | Modifies an object password when a modify event for a password occurs. |

## operation-data

Used to allow policies to inject an additional custom data payload to be carried along with any event or command. It is stripped from the event or command before it is submitted to the application shim and then reassociated with any corresponding response elements (as determined by matching event-id) after they are returned to Identity Manager.

### Remarks

The content of the <operation-data> can be any well-formed XML, but it is recommended that any elements and attributes be placed in a custom namespace to avoid having them confused with standard Identity Manager operations.

The typical use for <operation-data> is to create a policy that supplies additional context on an operation that might be needed by the policy that handles the results of that operation.

For operations whose content is normally PCDATA, there should only be one <operation-data> and it should be after any character data. This is contrary to the content rule specified by the DTD because DTDs for mixed content do not allow more precise specification.

### Example

```
<operation-data xmlns:mystuff="http://mystuff.operation.data">
  <mystuff:notify>admin@fred.com</mystuff:notify>
</operation-data>
```

### Allowed Content

ANY

### Attributes

None

### Content Rule

ANY

### Parent Elements

| Element                               | Description  |
|---------------------------------------|--|
| <a href="#">add</a>                   | Adds an object when an add event occurs.                 |
| <a href="#">add-association</a>       | Adds an association.                                     |
| <a href="#">check-object-password</a> | Checks the password against an eDirectory object.        |
| <a href="#">check-password</a>        | Checks the password against an eDirectory driver object. |

| Element            | Description   |
|--------------------|---|
| delete             | Deletes an object when a delete event occurs.                                       |
| get-named-password | Retrieves a named password for a driver.  |
| init-params        | initialization parameters for the DriverShim, SubscriptionShim, or PublicationShim. |
| instance           | Current state of an instance of an object.  |
| modify             | Modifies an object when a modify event occurs.                                      |
| modify-association | Modifies an association command.  |
| modify-password    | Modifies an object password when a modify event for a password occurs.              |
| move               | Moves an object when a move event occurs.   |
| query              | Query command.  |
| query-ex           | Query command with a result count limit.  |
| query-schema       | Query schema command.   |
| remove-association | Removes an association.   |
| rename             | Renames an object when a rename event occurs.                                       |
| schema-def         | Schema definition.  |
| sync               | Resynchronization or migrate event.   |

# output

Used to encapsulate events or commands returned to a driver or Identity Manager. All `<nds>` documents returned from Identity Manager or the driver interface method should contain exactly one `<output>`.

## Example

See `<nds>`.

## Allowed Content

| Element                         | Description   |
|---------------------------------|---|
| <code>status</code>             | Status of the processing of a command or event.                                   |
| <code>add-association</code>    | Adds an association command.  |
| <code>modify-association</code> | Modifies an association command.  |
| <code>remove-association</code> | Removes an association command.   |
| <code>instance</code>           | Current state of an instance of an object.  |
| <code>schema-def</code>         | Schema definition.  |
| <code>init-params</code>        | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |
| <code>password</code>           | The authentication password.  |
| <code>query-token</code>        | Opaque handle for query-ex commands.  |

## Attributes

None

## Content Rule

( `status` | `add-association` | `modify-association` | `remove-association` | `instance` | `schema-def` | `init-params` | `password` | `query-token` ) \*

## Parent Elements

| Element          | Description  |
|------------------|--|
| <code>nds</code> | Top-level element for all Identity Manager and Driver communication. |

# parent

Used to specify the destination container for a **<move>** event or command, or the current container of an object represented by an **<instance>**.

## Remarks

When originating from a driver, the **<parent>** must contain an **<association>** containing the unique key of the container object. When originating from Identity Manager, **<parent>** contains an **<association>** only if the container object has an established association in eDirectory.

## Example

See **<move>**.

## Allowed Content

| Element            | Description                           |
|--------------------|---------------------------------------|
| <b>association</b> | Unique key of the application object. |

## Attributes

| Attribute        | Possible Values  | Default Value |
|------------------|--|---------------|
| dest-dn          | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver. | #IMPLIED      |
| dest-entry-id    | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.           | #IMPLIED      |
| qualified-src-dn | CDATA<br><br>The qualified version of src-dn. Only used for describing objects from eDirectory.  | #IMPLIED      |

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| src-dn       | CDATA<br><br>The distinguished name of the source object that generated the event in the namespace of the sender.   | #IMPLIED      |
| src-entry-id | CDATA<br><br>The entry ID of the source object that generated the event in the namespace of the sender.<br><br>Reserved. Should be ignored by the driver. | #IMPLIED      |

## Content Rule

( association ? )

## Parent Elements

| Element  | Description                                |
|----------|--|
| instance | Current state of an instance of an object. |
| move     | Moves an object when a move event occurs.  |

# password

Used to specify the initial password for an object in an <add>, to specify the authentication password for a driver in an <authentication-info> element (it comes from the DirXML-ShimAuthPassword attribute on the DirXML-Driver object), or to return the value of a named password as the result of processing a <get-named-password> command.

## Example

See <init-params>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element               | Description  |
|-----------------------|--|
| add                   | Adds an object when an add event occurs.                               |
| authentication-info   | Information for connecting and authenticating to the application.      |
| check-object-password | Checks the password against an eDirectory object.                      |
| modify-password       | Modifies an object password when a modify event for a password occurs. |
| output                | Results of events or commands.   |



# placement

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<do-set-op-dest-dn>` instead.

## Remarks

`<placement>` is used to specify the distinguished name for an object that is about to be created and match the selection criteria for the enclosing `<placement-rule>`.

The DN is generated by concatenating in order the text and the text substitutions generated by the enclosed token elements. Any leading or trailing white space is removed unless it was enclosed by a CDATA section.

## Example

See `<placement-rules>`.

## Allowed Content

#PCDATA

| Element          | Description   |
|------------------|---|
| copy-name        | Copies a name token. Deprecated as of Identity Manager 2.0.       |
| copy-attr        | Copies an attribute token. Deprecated as of Identity Manager 2.0. |
| copy-path        | Copies a path token. Deprecated as of Identity Manager 2.0.       |
| copy-path-suffix | Copies a path token. Deprecated as of Identity Manager 2.0.       |

## Attributes

None

## Content Rule

( #PCDATA | copy-name | copy-attr | copy-path | copy-path-suffix ) \*

## Parent Elements

| Element                     | Description   |
|-----------------------------|---|
| <code>placement-rule</code> | Object placement rule. Deprecated as of Identity Manager 2.0. |

# placement-rule

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<rule>`.

## Remark

`<placement-rule>` is used to specify the criteria for generating a distinguished name for an object that is about to be created.

When a `<placement-rule>` is evaluated, it first checks whether or not this is a suitable rule for the `<add>` event in question. It does this by checking if any `<match-class>` elements are specified by the rule. If so, the rule is only suitable if the class-name on the event matches the class-name on one of the `<match-class>` elements. It then checks if any `<match-attr>` criteria are specified by the rule. If so, the rule is only suitable if the `<add>` contains all the attribute values required by the `<match-attr>`. It then checks if any `<match-path>` criteria are specified by the rule. If so, the src-dn of the `<add>` must be in at least one of the subtrees specified by a `<match-path>`. If a rule is determined to not be suitable, it is skipped.

When a suitable rule is found, the `<placement>` is evaluated to generate a value for the dest-dn attribute on the `<add>`.

If no suitable rule is found, the dest-dn is left blank and processing of the `<add>` continues.

## Example

See `<placement-rules>`.

## Allowed Content

| Element                  | Description  |
|--------------------------|--|
| <code>match-class</code> | Matches a class name. Deprecated as of Identity Manager 2.0.       |
| <code>match-path</code>  | Matches a path. Deprecated as of Identity Manager 2.0.             |
| <code>match-attr</code>  | Matches an attribute. Deprecated as of Identity Manager 2.0.       |
| <code>placement</code>   | Object placement specifier. Deprecated as of Identity Manager 2.0. |

## Attributes

| Attribute   | Possible Values   | Default Value |
|-------------|---|---------------|
| description | CDATA<br>Description of this rule, primarily for use in ConsoleOne. | #IMPLIED      |

## Content Rule

( match-class \* , match-path \* , match-attr \* , placement )

## Parent Elements

| Element                         | Description   |
|---------------------------------|---|
| <a href="#">placement-rules</a> | Top-level element for object placement rules.<br>Deprecated as of Identity Manager 2.0. |

# placement-rules

Deprecated as of Identity Manager 2.0. Use DirXMLScript `<policy>` instead.

## Remarks

`<placement-rules>` is the top level (document) element for object placement rules. Object matching rules are stored in the DirXML-XmlData attribute of a DirXML-Rule object that is pointed to by the DirXML-PlacementRule attribute of a DirXML-Subscriber or DirXML-Publisher object.

In the Subscriber channel, the source is eDirectory, and the destination is the application. In the Publisher channel, the source is the application and the destination is eDirectory.

Object placement rules are used to generate a distinguished name for an object that is about to be created as the result of an `<add>` event in the source. (Identity Manager automatically converts `<modify>` into `<add>` for events from unassociated objects). Object placement rules are applied only after any existing creation rules are applied and the `<add>` is not vetoed.

`<placement-rules>` contains 0 or more `<placement-rule>` elements. The placements rule processor evaluates each `<placement-rule>` in order until a suitable rule is found. That rule then fills in the dest-dn attribute of the `<add>`.

The distinguished name format for the source event is specified by src-dn-format or src-dn-delims (but not both) and must match what the source application actually uses. The distinguished name format for the destination event is specified by dest-dn-format or dest-dn-delims (but not both) and must match what the destination application actually uses. The format used by eDirectory through Identity Manager is slash.

One of the standard DN formats should be adequate for most applications, but it might be necessary to specify a custom delimiter set. The eight characters that make up the delimiter set are defined as follows:

- ♦ Typed Name Boolean Flag: 0 means names are not typed, 1 means names are typed
- ♦ Unicode\* No-Map Character Boolean Flag: 0 means don't output or interpret unmappable Unicode characters as escaped hex digit strings, such as \FEFF. The Unicode characters 0xfeff, 0xffff, 0xfffd, and 0xffff are not accepted by eDirectory.
- ♦ Relative RDN Delimiter
- ♦ RDN Delimiter
- ♦ Name Divider
- ♦ Name Value Delimiter
- ♦ Wildcard Character
- ♦ Escape Character

If the RDN Delimiter and Relative RDN Delimiter are the same character, then the orientation of the name is root right, otherwise the orientation is root left.

## Example

```
<placement-rules src-dn-format="slash" dest-dn-format="ldap">
  <!-- for Users coming from the subtree \Tree\novell in eDirectory
-->
  <!-- place them in the same relative hierarchy under o=novell -->
    <placement-rule>
      <match-class class-name="User"/>
      <match-path prefix="\TREE\novell"/>

<placement><copy-path-suffix/>,o=novell</placement>
  </placement-rule>
  <!-- for all other users and groups -->
  <!-- place them in the department container under novell -->
  <placement-rule>
    <match-class class-name="User"/>
    <match-class class-name="Group"/>
    <placement>cn=<copy-name/>,ou=<copy-attr attr-name="OU"/
>,o=novell</placement>
  </placement-rule>
  <!-- for everything else, try to mirror the hierarchy -->
  <placement-rule>
    <placement><copy-path/></placement>
  </placement-rule>
</placement-rules>
```

## Allowed Content

| Element               | Description   |
|-----------------------|---|
| <b>placement-rule</b> | Object placement rule. Deprecated as of Identity Manager 2.0. |

## Attributes

| Attribute      | Possible Values  | Default Value |
|----------------|--|---------------|
| dest-dn-delims | CDATA<br>Custom delimiters for the dest-dn.                                      | #IMPLIED      |
| dest-dn-format | dot   qualified-dot   slash  <br>qualified-slash   ldap<br>Format of the src-dn. | slash         |
| src-dn-delims  | CDATA<br>Custom delimiters for the src-dn.                                       | #IMPLIED      |

| Attribute             | Possible Values   | Default Value |
|-----------------------|---|---------------|
| src-dn-format         | dot   qualified-dot   slash  <br>qualified-slash   ldap | slash         |
| Format of the src-dn. |   |               |

## Content Rule

( placement-rule \* )

## Parent Elements

None

# **publisher-options**

Used to specify driver-specific configuration options. It comes from the DirXML-ShimConfigInfo attribute of the DirXML-Driver object in eDirectory. See <driver-config> for details on the contents.

## **Example**

See <driver-config>.

## **Allowed Content**

ANY

## **Attributes**

None

## **Content Rule**

ANY

## **Parent Elements**

| Element       | Description   |
|---------------|---|
| driver-config | Driver-specific DriverShim configuration options.                                 |
| init-params   | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |

# **publisher-state**

Used to specify driver-specific state information for the PublicationShim.

## **Remarks**

<publisher-state> can be included inside of <init-params> in any <output> or <input> from the driver to Identity Manager, which instructs Identity Manager to store the contents on the DirXML-DriverStorage attribute of the DirXML-Driver object in eDirectory.

The <publisher-state> stored on the DirXML-Driver object is included in the <init-params> sent to PublicationShim.init() when a driver is started.

## **Example**

See <init-params>.

## **Allowed Content**

ANY

## **Attributes**

None

## **Content Rule**

ANY

## **Parent Elements**

| Element     | Description   |
|-------------|---|
| init-params | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |



# query

A command used to find and read objects from eDirectory or the application. Full functionality for Identity Manager rules, object migration, etc. depends on full implementation of the query command by the driver.

## Remarks

The base object of the <query> is specified by either by the dest-dn attribute or by an <association>. If both are present, the dest-dn attribute takes precedence when querying eDirectory, and the <association> takes precedence when querying a connected application (other than eDirectory). If neither are present, the base object defaults to the root object in a hierarchical namespace or all objects in a non-hierarchical namespace.

Possible scopes for the query are:

| Element      | Description  |
|--------------|--|
| entry        | The base object only.  |
| subordinates | The objects contained by the base object.  |
| subtree      | The objects in the subtree whose root is the base object, including the base object. |

By default, all objects in the specified scope are selected. For scopes other than “entry,” selected objects can be further limited by <search-class> and <search-attr>. For scope “entry,” the effect of <search-attr> and <search-class> are undefined.

When there are <search-class> elements, only objects whose base class matches one of the <search-class> elements are selected.

When there are <search-attr> elements, only objects with attributes matching all of the values specified by all of the <search-attr> element is selected.

By default, all object attributes for the selected objects are to be read. The attributes to be read are limited by <read-attr>. To read none of the object attributes, specify a single nameless <read-attr>.

The <parent> of the selected objects is also read if <read-parent> is specified.

The <parent> of the selected objects is also read if <read-parent> is specified.

A response to <query> should include an <instance> for each of the selected objects.

A response to <query> should also include a <status> indicating whether or not the <query> is processed successfully. It should not be considered an error if no objects exist that match the search criteria.

## Example

```
<!-- search the whole application for a User object with the Surname of
Jones -->
<!-- don't read any attributes but read the parent -->
<query class-name="User" event-id="0" scope="subtree">
  <search-class class-name="User"/>
  <search-attr attr-name="Surname">
    <value type="string">Jones</value>
  </search-attr>
  <read-attr/>
  <read-parent/>
</query>
<!-- read the User object whose foreign key is 1011 -->
<!-- read Surname,cn,Given Name and Telephone Number attributes -->
<query class-name="User" event-id="1" scope="entry">
  <association>1011</association>
  <read-attr attr-name="Surname"/>
  <read-attr attr-name="cn"/>
  <read-attr attr-name="Given Name"/>
  <read-attr attr-name="Telephone Number"/>
</query>
```

## Allowed Content

| Element        | Description                                    |
|----------------|--|
| association    | Unique key of the application object.          |
| search-class   | Query search class filter.                     |
| search-attr    | Query search attribute value filter.           |
| read-attr      | Returns the specified object attribute values. |
| read-parent    | Returns the object parent.                     |
| operation-data | The operation adds additional custom data.     |

## Attributes

| Attribute     | Possible Values  | Default Value |
|---------------|--|---------------|
| class-name    | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace.<br><br>This is required for proper schema mapping of any attribute names specified in the search. It should not be used to limit the search. | #IMPLIED      |
| dest-dn       | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.   | #IMPLIED      |
| dest-entry-id | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |
| event-id      | CDATA<br><br>An identifier used to tag the results of an event or command.   | #IMPLIED      |
| scope         | entry   subordinates   subtree<br><br>The scope of the query.  | subtree       |

## Content Rule

( association ? , ( search-class | search-attr | read-attr | read-parent ) \* , operation-data ? )

## Parent Elements

| Element                    | Description   |
|----------------------------|---|
| <code>config-object</code> | eDirectory object to use for additional configuration data. |
| <code>input</code>         | Input events or commands.                                   |

# query-ex

A `<query>` variant used to limit the number of search results returned at one time. See `<query>` for general information on searches and queries.

## Remarks

The results of a query-ex command might include a `<query-token>` element. The query-token element is used in subsequent query-ex commands to retrieve additional results. If query-ex results do not contain a query-token element, then all of the available results for that query-ex command are returned. A different query-token might be returned with each result set. It is not sufficient to use only the query-token returned with the first result set.

The query-ex command has additional attributes that the query command does not:

- ♦ The max-result-count attribute, which specifies the maximum number of `<instance>` elements to return as the result of a single query-ex command.
- ♦ The cancel attribute, which is used to cancel a query-ex sequence, thereby freeing any resources associated with the search.

A query-ex command sequence might consist of multiple query-ex commands issued sequentially. The first query-ex command establishes the parameters of the search, returns the initial result set, and, if there are more results than can be returned with the initial result set, also returns a token to be used with subsequent query-ex commands. Subsequent query-ex commands contain the query-token element and are issued repeatedly to obtain additional result sets from the initial search. This process continues until no query-token element appears in the result set.

Subsequent query-ex commands using a token returned from a previous query-ex do not change the parameters of a search, regardless of any attributes or child elements.

A query-ex sequence can be abandoned before all results are returned by setting the cancel attribute equal to true on a query-ex command.

Not all application shims support query-ex. Those that do report their support to the Metadirectory engine at shim startup time by returning the following as a child of the `<instance>` element that is returned as the response to the driver identification query:

```
<attr attr-name="query-ex-supported">
  <value type="state">true</value>
</attr>
```

## Example

```
<!-- search the whole application for all User objects -->
<!-- don't read any attributes -->
<query-ex class-name="User" event-id="0" scope="subtree" max-result-count="50">
  <search-class class-name="User"/>
  <read-attr/>
</query-ex>

<!-- read additional results based on the above query, assuming that
the results of the above included the query-token illustrated -->
<query-ex>
```

```

    <query-
token>r00ABXNyACxjb20ubm92ZWxsIm5kcy5kaXJ4bWwuzW5naW5lLk5EU1JlYWRLciRUB2tlbuWeJE0g
a5xBAgACsgAFc3RhbXBJAAldGF0ZUhhc2h4cAAAAQQLokQbAbjW9w==</query-token>
</query-ex>

<!-- cancel a query-ex before having read all results -->
<query-ex cancel="true">
    <query-
token>r00ABXNyACxjb20ubm92ZWxsIm5kcy5kaXJ4bWwuzW5naW5lLk5EU1JlYWRLciRUB2tlbuWeJE0g
a5xBAgACsgAFc3RhbXBJAAldGF0ZUhhc2h4cAAAAQQLokQbAbjW9w==</query-token>
</query-ex>

```

## Allowed Content

| Element               | Description                                    |
|-----------------------|--|
| <b>association</b>    | Unique key of the application object.          |
| <b>query-token</b>    | Opaque handle for query-ex commands.           |
| <b>search-class</b>   | Query search class filter.                     |
| <b>search-attr</b>    | Query search attribute value filter            |
| <b>read-attr</b>      | Returns the specified object attribute values. |
| <b>read-parent</b>    | Returns the object parent.                     |
| <b>operation-data</b> | The operation adds additional custom data.     |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| cancel    | true   false<br><br>If set to true on a query-ex command containing a <b>&lt;query-token&gt;</b> element, then the search is abandoned and all associated resources are freed by the search target. | #IMPLIED      |

| Attribute        | Possible Values   | Default Value |
|------------------|---|---------------|
| class-name       | CDATA<br><br>he name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace.<br><br>This is required for proper schema mapping of any attribute names specified in the search. It should not be used to limit the search. | #IMPLIED      |
| dest-dn          | CDATA<br><br>The distinguished name of the target object in the namespace of the receiver.  | #IMPLIED      |
| dest-entry-id    | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |
| event-id         | CDATA<br><br>An identifier used to tag the results of an event or command.  | #IMPLIED      |
| max-result-count | CDATA<br><br>Specifies the maximum number of <b>&lt;instance&gt;</b> elements to return as a result of a query-ex command. Valid values are positive decimal integers.  | #IMPLIED      |
| scope            | entry   subordinates   subtree<br><br>The scope of the query. Entry scope makes little sense with query-ex, but is supported.   | subtree       |

## Content Rule

( association ? , query-token ? , ( search-class | search-attr | read-attr | read-parent ) \* , operation-data ? )

## Parent Elements

| Element            | Description               |
|--------------------|---------------------------|
| <code>input</code> | Input events or commands. |



# query-schema

A command used read the schema definition from eDirectory or the application. Drivers are not currently required to implement it, but this might change. Drivers are required to implement the DriverShim.getSchema() method, which does exactly the same thing.

## Remarks

A response to <query-schema> should be a <schema-def>.

A response to <query> should also include a <status> indicating whether or not the <query> is processed successfully.

## Example

```
<query-schema/>
```

## Allowed Content

| Element        | Description                                |
|----------------|--|
| operation-data | The operation adds additional custom data. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| event-id  | CDATA<br>An identifier used to tag the results of an event or command. | #IMPLIED      |

## Content Rule

( operation-data ? )

## Parent Elements

| Element | Description               |
|---------|---------------------------|
| input   | Input events or commands. |

# query-token

Used in conjunction with the **query-ex** command. The content of the query-token element is an opaque token or handle that is used to refer to unreturned search results that are the result of a query-ex command.

## Remarks

A <query-token> element might be returned in the result set of a query-ex command and is used as a child of a <**query-ex**> element to obtain additional results selected by an initial query-ex command.

## Allowed Content

ANY

## Attributes

None

## Content Rule

ANY

## Parent Elements

| Element         | Description                              |
|-----------------|--|
| <b>output</b>   | Results of events or commands.           |
| <b>query-ex</b> | Query command with a result count limit. |

# read-attr

Used to specify the object attributes to be read by the enclosing `<query>` command.

## Example

See `<query>`.

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| attr-name | CDATA<br><br>The name of the attribute.<br><br>The name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. The mapping rule uses the class name attribute of the enclosing command or event to determine which class to use for mapping the attribute name. | #IMPLIED      |
| type      | default   xml<br><br>If type=xml, then the attribute value is parsed as XML and returned as such.   | default       |

## Content Declaration

Empty

## Parent Elements

| Element               | Description                              |
|-----------------------|--|
| <code>query</code>    | Query command.                           |
| <code>query-ex</code> | Query command with a result count limit. |

# read-parent

Used to specify that a `<parent>` should be included in all instances returned by the enclosing `<query>` command.

## Example

See `<query>`.

## Allowed Content

EMPTY

## Attributes

None

## Content Declaration

Empty

## Parent Elements

| Element               | Description                              |
|-----------------------|--|
| <code>query</code>    | Query command.                           |
| <code>query-ex</code> | Query command with a result count limit. |

# remove-all-values

Used to specify all values that are removed from the attribute specified in the enclosing `<modify-attr>`.

## Example

See `<modify>`.

## Allowed Content

EMPTY

## Attributes

None

## Content Declaration

Empty

## Parent Elements

| Element                  | Description       |
|--------------------------|-------------------|
| <code>modify-attr</code> | Modify attribute. |

# remove-association

Used to notify Identity Manager that a particular unique key is not valid. <remove-association> should generally occur when an invalid association value is sent to the driver by Identity Manager. It can also be useful as part of an Event Transformation policy. Can be included in any <output> or <input> from the driver to Identity Manager.

## Example

```
<remove-association>
  {BC3E7155-CDF9-d311-9846-0008C76B16C2}
</remove-association>
```

## Allowed Content

#PCDATA

| Element        | Description                                |
|----------------|--|
| operation-data | The operation adds additional custom data. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| event-id  | CDATA<br>An identifier used to tag the results of an event or command. | #IMPLIED      |

## Content Rule

( #PCDATA | operation-data ) \*

## Parent Elements

| Element | Description                    |
|---------|--------------------------------|
| input   | Input events or commands.      |
| output  | Results of events or commands. |

## remove-value

Used to specify values removed from the attribute specified in the enclosing `<modify-attr>`. Each `<add-attr>` should contain at least one `<value>`. A driver should gracefully ignore a `<remove-value>` for a value that does not exist and continue to process the remainder of the enclosing `<modify>`.

### Example

See `<modify>`.

### Allowed Content

| Element            | Description          |
|--------------------|----------------------|
| <code>value</code> | The attribute value. |

### Attributes

None

### Content Rule

( value + )

### Parent Elements

| Element                  | Description       |
|--------------------------|-------------------|
| <code>modify-attr</code> | Modify attribute. |

# rename

Used as an event notification from the PublicationShim to Identity Manager that an object is renamed in the application. When it is used as a notification, an **<association>** is required. Also used as a command from Identity Manager to the SubscriptionShim to rename an object in the application. When it is used as a command, an **<association>** is required and is the unique key of the object to rename.

## Remarks

**<rename>** contains a **<new-name>** that specifies the new name.

A response to **<rename>** should be a **<status>** indicating whether or not the **<rename>** was processed successfully.

## Example

```
<rename class-name="User" src-dn="\Samuel" old-src-dn="\Sam">  
  <association>1012</association>  
  <new-name>Samuel</new-name>  
</rename>
```

## Allowed Content

| Element               | Description                                |
|-----------------------|--|
| <b>association</b>    | Unique key of the application object.      |
| <b>new-name</b>       | The new name of a renamed object.          |
| <b>operation-data</b> | The operation adds additional custom data. |

## Attributes

| Attribute     | Possible Values  | Default Value |
|---------------|--|---------------|
| dest-entry-id | CDATA<br><br>The entry ID of the target object in the namespace of the receiver.<br><br>Reserved. Should be ignored by the driver. | #IMPLIED      |
| event-id      | CDATA<br><br>An identifier used to tag the results of an event or command.   | #IMPLIED      |



| Attribute            | Possible Values   | Default Value |
|----------------------|---|---------------|
| old-src-dn           | CDATA<br><br>The original distinguished name of the source object that generated the event in the namespace of the sender.  | #IMPLIED      |
| qualified-old-src-dn | CDATA<br><br>The qualified version of the old-src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |
| qualified-src-dn     | CDATA<br><br>The qualified version of the src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |
| remove-old-name      | true   false<br><br>True if the old name should be removed, false otherwise.<br><br>Usually only used in X.500 type applications where the name of an object is also an attribute of the object that can exist independently.     | true          |
| src-dn               | CDATA<br><br>The distinguished name of the source object that generated the event in the namespace of the sender.<br><br>The new distinguished name of the source object that generated the event in the namespace of the sender. | #IMPLIED      |
| src-entry-id         | CDATA<br><br>The entry ID of the source object that generated the event in the namespace of the sender.<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |
| timestamp            | CDATA<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |

## Content Rule

( association ? , new-name , operation-data ? )

## Parent Elements

| Element            | Description               |
|--------------------|---------------------------|
| <code>input</code> | Input events or commands. |

# required-attr

Deprecated as of Identity Manager 2.0. Use DirXMLScript <do-veto-if-op-attr-not-available> or <do-set-default-attr-value> instead.

## Remarks

<required-attr> is used to specify an attribute required to create an object as part of the criteria for the enclosing <create-rule>.

<required-attr> can contain one or more <value> elements. If it contains any value elements, there are used as default values if the <add> event did not specify that attribute. If no default values are specified, then the <add> event is vetoed unless it contains an <add-attr> corresponding to the attr-name of the <required-attr>.

## Example

See <create-rules>.

## Allowed Content

| Element | Description          |
|---------|----------------------|
| value   | The attribute value. |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| attr-name  | CDATA<br><br>The name of the required attribute in the eDirectory namespace.                           | #REQUIRED     |
| write-back | true   false<br><br>Set to true if the default value should also be written back to the source object. | false         |

## Content Rule

( value ) \*

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>create-rule</code> | Object creation rule. Deprecatd as of Identity Manager 2.0. |

# schema-def

Used as part of the response to a query-schema command and to the DriverShim.getSchema() method. It specifies the schema for an application or edirectory. It is also the top-level element of the XML stored in the DirXML-ApplicationSchema attribute of the DirXML-Driver object.

## Remarks

The distinguished name format for the application is specified by dn-format or dn-delims (but not both) and must match what the source application actually uses.

One of the standard DN formats should be adequate for most applications, however it might be necessary to specify a custom delimiter set. The eight characters that make up the delimiter set are defined as follows:

- ♦ Typed Name Boolean Flag: 0 means names are not typed, 1 means names are typed
- ♦ Unicode No-Map Character Boolean Flag: 0 means don't output or interpret unmappable Unicode characters as escaped hex digit strings, such as, \FEFF. The 0xfeff, 0xfffe, 0xfffd, and 0xffff Unicode characters are not accepted by eDirectory.
- ♦ Relative RDN Delimiter
- ♦ RDN Delimiter
- ♦ Name Divider
- ♦ Name Value Delimiter
- ♦ Wildcard Character
- ♦ Escape Character

If RDN Delimiter and Relative RDN Delimiter are the same character, then the orientation of the name is root right, otherwise the orientation is root left.

If there are more than eight characters in the delimiter set, then the extra characters are all considered to be characters that need to be escaped but have no other special meaning within Identity Manager.

## Example

```
<schema-def hierarchical="true">
  <class-def class-name="Organization" container="true">
    <attr-def attr-name="Name" case-sensitive="false" multi-valued="false"
naming="true" read-only="false" required="false" type="string"/>
    <attr-def attr-name="Object Path" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
type="string"/>
    <attr-def attr-name="Unique Id" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
type="string"/>
  </class-def>
  <class-def class-name="Organizational Unit" container="true">
    <attr-def attr-name="Name" case-sensitive="false" multi-valued="false"
naming="true" read-only="false" required="false" type="string"/>
    <attr-def attr-name="Object Path" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
```

```

type="string"/>
  <attr-def attr-name="Unique Id" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
type="string"/>
</class-def>
<class-def class-name="User" container="false">
  <attr-def attr-name="cn" case-sensitive="false" multi-valued="false"
naming="true" read-only="false" required="true" type="string"/>
  <attr-def attr-name="Surname" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="false"
type="string"/>
  <attr-def attr-name="Given Name" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="false"
type="string"/>
  <attr-def attr-name="Telephone Number" case-sensitive="false"
multi-valued="true" naming="false" read-only="false" required="false"
type="string"/>
  <attr-def attr-name="Object Path" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
type="string"/>
  <attr-def attr-name="Unique Id" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
type="string"/>
</class-def>
<class-def class-name="Bogus" container="false">
  <attr-def attr-name="Whatever" case-sensitive="false"
multi-valued="true" naming="true" read-only="false" required="false"
type="string"/>
  <attr-def attr-name="Object Path" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
type="string"/>
  <attr-def attr-name="Unique Id" case-sensitive="false"
multi-valued="false" naming="false" read-only="false" required="true"
type="string"/>
</class-def>
</schema-def>

```

## Allowed Content

| Element               | Description                                |
|-----------------------|--|
| <b>class-def</b>      | Schema class definition.                   |
| <b>operation-data</b> | The operation adds additional custom data. |

## Attributes

| Attribute        | Possible Values   | Default Value |
|------------------|---|---------------|
| application-name | CDATA<br><br>Specifies the name of the application that uses the schema.                                  | #IMPLIED      |
| dn-delims        | CDATA<br><br>The custom DN format used by the application   | #IMPLIED      |
| dn-format        | dot   qualified-dot   slash   qualified-slash   ldap<br><br>The DN format used by the application.        | slash         |
| hierarchical     | true   false<br><br>Specifies whether or not the application stores its data in a hierarchical structure. | true          |

## Content Rule

(( class-def ) \* , operation-data ? )

## Parent Elements

| Element       | Description                    |
|---------------|--------------------------------|
| <b>output</b> | Results of events or commands. |

# search-attr

Used to specify the object attributes to be searched for by the enclosing `<query>` command. Each `<search-attr>` should contain at least one `<value>`.

## Example

See `<query>`.

## Allowed Content

| Element            | Description          |
|--------------------|----------------------|
| <code>value</code> | The attribute value. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| attr-name | CDATA<br><br>The name of the attribute.<br><br>The name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. The mapping policies use the class name attribute of the enclosing command or event to determine which class to use for mapping the attribute name | #REQUIRED     |

## Content Rule

( value ) +

## Parent Elements

| Element               | Description                            |
|-----------------------|--|
| <code>query</code>    | Query command.                         |
| <code>query-ex</code> | Query command with result count limit. |



# search-class

Used to specify the object base classes to be searched for by the enclosing `<query>` command.

## Example

See `<query>`.

## Allowed Content

EMPTY

## Attributes

| Attribute               | Possible Values  | Default Value |
|-------------------------|--|---------------|
| <code>class-name</code> | CDATA<br><br>The name of the base class of the object. The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. | #REQUIRED     |

## Content Declaration

Empty

## Parent Elements

| Element               | Description                            |
|-----------------------|--|
| <code>query</code>    | Query command.                         |
| <code>query-ex</code> | Query command with result count limit. |

## server

Used to specify the application server for a driver in an `<authentication-info>`. It comes from the DirXML-ShimAuthServer attribute on the DirXML-Driver object.

### Example

See `<init-params>`.

### Allowed Content

#PCDATA

### Attributes

None

### Content Rule

( #PCDATA )

### Parent Elements

| Element                          | Description   |
|----------------------------------|---|
| <code>authentication-info</code> | Information for connecting and authenticating to the application. |

## source

Used to specify the source of the enclosing document.

## Example

See `<nds>`.

## Allowed Content

| Element | Description                                      |
|---------|--|
| product | The product from which this document originated. |
| contact | Point of contact for the originating product.    |

## Attributes

None

## Content Rule

( product ? , contact ? )

## Parent Elements

| Element | Description  |
|---------|--|
| nds     | Top-level element for all Identity Manager and driver communication. |

## status

Used to return the status of an operation or event. More than one <status> can be returned for each operation or event. <status> can also be included in an input from the driver to Identity Manager when the driver wants to log status of the driver to the Identity Manager log.

## Remarks

Possible values for the level attribute are:

| Value   | Description   |
|---------|---|
| success | Operation or event was successful.                                      |
| warning | Operation or event was partially successful.                            |
| error   | Operation or event failed.  |
| fatal   | A fatal error occurred. The driver should be shut down.                 |
| retry   | Application server was unavailable. Send this event or operation later. |

Standard values for the type attribute include:

| Value                  | Description   |
|------------------------|---|
| app-general            | General responses from an application API.                            |
| app-authentication     | Related to application authentication requests.                       |
| app-connection         | Identifies a change in the availability of an application.            |
| driver-general         | Identifies a response generated by a driver.                          |
| driver-status          | A driver state change occurred.                                       |
| password-set-operation | Identifies a response to an application password set or change event. |
| remoteloader           | Messages generated by the Identity Manager Remote Loader.             |

If a <status> is not returned for a particular event or command, it is assumed to have succeeded.

## Example

```
<status event-id="0" level="success"/>
  <status event-id="0" level="warning">Objects in the rear view mirror may appear
closer than they are!</status>
  <status event-id="0" level="warning" type="driver-status">Driver state changed
to Stopped.</status>
```

## Allowed Content

ANY

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| event-id  | CDATA<br><br>An identifier used to tag the results of an event or command.<br><br>Should be the same as the event-id of the operation or event that this status is associated with | #IMPLIED      |
| level     | fatal   error   warning   success   retry<br><br>The status level.   | #REQUIRED     |
| type      | CDATA<br><br>An identifier used to classify the <b>&lt;status&gt;</b> for reporting purposes.  | #IMPLIED      |

## Content Rule

ANY

## Parent Elements

| Element       | Description                    |
|---------------|--------------------------------|
| <b>input</b>  | Input events or commands.      |
| <b>output</b> | Results of events or commands. |

# subscriber-options

Used to specify driver-specific configuration options. It comes from the DirXML-ShimConfigInfo attribute of the DirXML-Driver object in eDirectory. See <driver-config> for details on the contents.

## Example

See <driver-config>.

## Allowed Content

ANY

## Attributes

None

## Content Rule

ANY

## Parent Elements

| Element       | Description   |
|---------------|---|
| driver-config | Driver-specific DriverShim configuration options.                                 |
| init-params   | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |

# subscriber-state

Used to specify driver-specific state information for the SubscriptionShim.

## Remarks

<subscriber-state> can be included inside of <init-params> in any <output> or <input> from the driver to Identity Manager, which instructs Identity Manager to store the contents on the DirXML-DriverStorage attribute of the DirXML-Driver object in eDirectory.

The <subscriber-state> stored in the DirXML-DriverStorage of the DirXML-Driver object is included in the <init-params> sent to SubscriptionShim.init() when a driver is started.

## Example

See <init-params>.

## Allowed Content

ANY

## Attributes

None

## Content Rule

ANY

## Parent Elements

| Element     | Description   |
|-------------|---|
| init-params | Initialization parameters for a DriverShim, SubscriptionShim, or PublicationShim. |

# sync

Appears on the Subscriber channel as the result of a resync (manual or automatic) or as the result of a Migrate from Identity Vault operation.

## Remarks

The <sync> is generally only visible in the Event Transformation policy. If the Event Transformation policy is used to perform scope-based filtering, then the <sync> element must be taken into account.

The <sync> element does not appear on the Publisher channel unless injected by the application shim or by a policy on the Publisher channel. However, <sync> elements are processed by Publisher channel policies in the case of a Migrate into Identity Vault operation.

## Example

```
<sync class-name="User" src-entry-id="3458909" qualified-src-dn="\T=TREE\O=container\CN=object" src-dn="\TREE\container\object">  
  <association>67847262</association>  
</sync>
```

## Allowed Content

| Element        | Description                                |
|----------------|--|
| association    | Unique key of the application object.      |
| operation-data | The operation adds additional custom data. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| class-id  | CDATA<br><br>Reserved. Should be ignored by the driver. | #IMPLIED      |



| Attribute        | Possible Values   | Default Value |
|------------------|---|---------------|
| class-name       | CDATA<br><br>The name of the base class of the object.<br><br>The class name is mapped between the application and eDirectory namespaces by the Schema Mapping policy so that Identity Manager sees the name in the eDirectory namespace and a driver sees the name in the application namespace. | #IMPLIED      |
| qualified-src-dn | CDATA<br><br>The qualified version of the src-dn. Only used for describing objects from eDirectory.   | #IMPLIED      |
| src-dn           | CDATA<br><br>The distinguished name of the source object that generated the event in the namespace of the sender.   | #IMPLIED      |
| src-entry-id     | CDATA<br><br>The entry ID of the source object that generated the event in the namespace of the sender.   | #IMPLIED      |
| timestamp        | CDATA<br><br>Reserved. Should be ignored by the driver.   | #IMPLIED      |

## Content Rule

( association ? , operation-data ? )

## Parent Elements

| Element      | Description               |
|--------------|---------------------------|
| <b>input</b> | Input events or commands. |

# template

Deprecated as of Identity Manager 2.0. Use DirXMLScript <do-set-op-template-dn> instead. Used to specify a template that is used for object creation as part of the criteria specified by the enclosing <create-rule>.

## Example

See <create-rules>.

## Allowed Content

EMPTY

## Attributes

| Attribute   | Possible Values  |
|-------------|--|
| template-dn | CDATA<br><br>The DN of the template that is used in the destination namespace. |

## Content Rule

Empty

## Parent Elements

| Element     | Description  |
|-------------|--|
| create-rule | Object creation rule. Deprecated as of Identity Manager 2.0. |

## user

Used to specify a user name to authenticate to the application server for a driver in an `<authentication-info>`. It comes from the DirXML-ShimAuthID attribute on the DirXML-Driver object.

## Example

See `<init-params>`.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

#PCDATA

## Parent Elements

| Element                          | Description   |
|----------------------------------|---|
| <code>authentication-info</code> | Information for connecting and authenticating to the application. |

# value

Used specify an individual attribute value of the attribute specified by the enclosing element.

## Remarks

If the type is structured, the <value> contains at least one <component>. If the type is octet, the content of the <value> is base64 encoded binary data. If the type is anything else, the content is text.

The following table shows the types used to represent the various eDirectory™ syntaxes.

| Syntax            | Type       | Components (Notes)  |
|-------------------|------------|---|
| SYN_UNKNOWN       | octet      | (Base64-encoded data)   |
| SYN_DIST_NAME     | dn         | (referential)   |
| SYN_CE_STRING     | string     |   |
| SYN_CI_STRING     | string     |   |
| SYN_PR_STRING     | string     |   |
| SYN_NU_STRING     | string     |   |
| SYN_CI_LIST       | structured | string (1 or more)  |
| SYN_BOOLEAN       | state      | true or false   |
| SYN_INTEGER       | int        |   |
| SYN_OCTET_STRING  | octet      | (Base64-encoded data)   |
| SYN_TEL_NUMBER    | teleNumber |   |
| SYN_FAX_NUMBER    | structured | faxNumber<br>faxBitCount<br>faxParameters (Base64-encoded data)                       |
| SYN_NET_ADDRESS   | structured | netAddrType<br>netAddr (Base64-encoded data)  |
| SYN_OCTET_LIST    | structured | octet (Base64-encoded data) (1 or more)   |
| SYN_EMAIL_ADDRESS | structured | eMailType<br>(1=SMF70,2=SMF71,3=SMTP,4=x400,5=snads,6=profs,7=Groupwise)<br>eMailAddr |
| SYN_PATH          | structured | nameSpace<br>volume (referential)<br>path   |

| Syntax              | Type       | Components (Notes)  |
|---------------------|------------|---|
| SYN_REPLICA_POINTER | structured | server (referential)<br>replicaType<br>replicaNumber<br>repeated 0 or more times {<br>netAddrType<br>netAddr (Base64-encoded data)<br>} |
| SYN_OBJECT_ACL      | structured | protectedName<br>trustee (referential)<br>privileges  |
| SYN_PO_ADDRESS      | structured | string (exactly 6)  |
| SYN_TIMESTAMP       | structured | seconds<br>replicaNumber<br>eventId   |
| SYN_CLASS_NAME      | classname  |   |
| SYN_STREAM          | octet      | (Base64-encoded data)   |
| SYN_COUNTER         | counter    |   |
| SYN_BACK_LINK       | structured | serverDn (referential)<br>remoteId  |
| SYN_TIME            | time       |   |
| SYN_TYPED_NAME      | structured | dn (referential)<br>level<br>interval   |
| SYN_HOLD            | structured | holdEntryDn (referential)<br>holdAmount   |
| SYN_INTERVAL        | interval   |   |
| SYNTAX_COUNT        | count      |   |

## Example

```

<value type="string">Gulia</value>
<value type="structured">
  <component name="eMailType">3</component>
  <component name="eMailAddr">me@myself.com</component>
</value>

```

## Allowed Content

#PCDATA

| Element   | Description                          |
|-----------|--------------------------------------|
| component | Component of a structured attribute. |

## Attributes

| Attribute       | Possible Values  | Default Value |
|-----------------|--|---------------|
| association-ref | CDATA<br><br>The association value (application object unique key) of the object being referenced by this value. This is required on all components that refer to other objects when the value is part of a notification event from the driver. This exists on all values that refer to other objects when the value is part of a command from Identity Manager if the referenced object has an established association in eDirectory. If a <component> is referential, the association-ref is on the <component> rather than the <value>. | #IMPLIED      |
| naming          | true   false<br><br>Reserved. Should be ignored by the driver.   | false         |
| timestamp       | CDATA<br><br>Reserved. Should be ignored by the driver.  | #IMPLIED      |
| type            | string   teleNumber   int   state   counter   dn   interval   octet   time   structured<br><br>The data type of the value.   | #IMPLIED      |

## Content Rule

( #PCDATA | component ) \*

## Parent Elements

| Element                    | Description  |
|----------------------------|--|
| <code>add-attr</code>      | Adds an attribute.   |
| <code>add-value</code>     | Adds values.   |
| <code>attr</code>          | Matches an attribute. Deprecated as of Identity Manager 2.0. |
| <code>match-attr</code>    | Inputs events or commands.                                   |
| <code>remove-value</code>  | Removes specified attribute values.                          |
| <code>required-attr</code> | Required attribute. Deprecated as of Identity Manager 2.0.   |
| <code>search-attr</code>   | Query search attribute value filter.                         |





# Map DTD

An Identity Manager mapping table is used by a DirXML Script policy to map a set of values to another set of corresponding values.

An Identity Manager mapping table consists of a top level `<mapping-table>` that contains a set of `<col-def>` elements and a set of `<row>` elements. A `<col-def>` defines the name of each column and the type that it contains. A `<row>` consists of a set of `<col>` elements. DirXML Script uses `<token-map>` to map a value using a specified key column to a different value or values in a specified value column. A given key column map map to multiple rows and therefore multiple values from the value column can be specified.

See “Map DTD Elements” on page 161 for a list of all of the elements in the Map DTD.

## 4.1 Map DTD Elements

| Element                    | Description                        |
|----------------------------|------------------------------------|
| <code>col</code>           | Mapping table column within a row. |
| <code>col-def</code>       | Column definition.                 |
| <code>mapping-table</code> | Mapping table.                     |
| <code>row</code>           | Mapping table row.                 |

# col

Defines the value of a column within a row in the mapping table.

## Example

See <mapping-table>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description        |
|---------|--------------------|
| row     | Mapping table row. |

## col-def

Defines a column in the mapping table. The name of the column is specified by name. The type of the column is specified by type. The type of the column defaults to nocase and is used; to determine the comparison rules used when the column is used as the key column for a mapping operation.

### Remarks

The legal values for type are:

| Value   | Description  |
|---------|--|
| case    | Character-by-character case sensitive comparison.  |
| nocase  | Character-by-character case insensitive comparison |
| numeric | Numeric comparison.                                |

### Example

See `<mapping-table>`.

### Allowed Content

EMPTY

### Attributes

| Attribute | Values                  | Default Value |
|-----------|-------------------------|---------------|
| name      | CDATA                   | #REQUIRED     |
|           | Name of the column      |               |
| type      | case   nocase   numeric | nocase        |
|           | type of the column      |               |

### Content Declaration

Empty

## Parent Elements

| Element       | Description    |
|---------------|----------------|
| mapping-table | Mapping table. |

# mapping-table

A mapping table consists of a top level <mapping-table> that contains a set of <col-def> elements and a set of <row> elements. A <col-def> defines the name of each column and the type that it contains. A <row> consists of a set of <col> elements. DirXML Script uses <token-map> to map a value using a specified key column to a different value or values in a specified value column. A given key column map to multiple rows and therefore multiple values from the value column can be specified.

## Example

```
<mapping-table>
  <col-def name="dept" type="nocase"/>
  <col-def name="code" type="nocase"/>
  <col-def name="location" type="nocase"/>
  <row>
    <col>Engineering</col>
    <col>00001</col>
    <col>New York</col>
  </row>
  <row>
    <col>Sales</col>
    <col>00002</col>
    <col>London</col>
  </row>
  <row>
    <col>Accounting</col>
    <col>00003</col>
    <col>Paris</col>
  </row>
  <row>
    <col>Marketing</col>
    <col>00004</col>
    <col>Rome</col>
  </row>
</mapping-table>
```

## Allowed Content

| Element | Description        |
|---------|--------------------|
| col-def | Column definition. |
| row     | Mapping table row. |

## Attributes

None

## Content Rule

( col-def \* , row \* )

## Parent Elements

None

## row

A `<row>` defines a row in the mapping table. The values for the columns within the row are defined by the enclosing `<col>` elements and correspond to the columns defined for the mapping table and must occur in the same order as the `<col-def>` elements. If there are fewer columns than there are columns defined for the table, then the missing columns will be assumed to be blank. If there are more columns in the row than are defined in the table, the additional columns are ignored.

## Example

See `<mapping-table>`.

## Allowed Content

| Element          | Description                        |
|------------------|------------------------------------|
| <code>col</code> | Mapping table column within a row. |

## Attributes

None

## Content Rule

( `col` \* )

## Parent Elements

| Element                    | Description    |
|----------------------------|----------------|
| <code>mapping-table</code> | Mapping table. |





# DirXML Script DTD

# 5

DirXML Script is the primary method of implementing policies in the Novell Identity Manager Metadirectory engine. DirXML Script describes a `<policy>` that is implemented by an ordered set of `<rule>` elements. A `<rule>` consists of a set of `<conditions>` to be tested and an ordered set of `<actions>` to be performed when the `<conditions>` are met.

See “DirXML Script DTD Elements” on page 169 for a list of all of the elements in the DirXML Script DTD.

## 5.1 DirXML Script DTD Elements

| Element                             | Description   |
|-------------------------------------|---|
| <code>actions</code>                | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>and</code>                    | Logical conjunction.  |
| <code>arg-actions</code>            | Actions argument.   |
| <code>arg-association</code>        | Association argument.                                       |
| <code>arg-component</code>          | Component argument.   |
| <code>arg-conditions</code>         | Conditions argument.  |
| <code>arg-dn</code>                 | DN argument.  |
| <code>arg-match-attr</code>         | Match attribute argument.                                   |
| <code>arg-node-set</code>           | Node set argument.  |
| <code>arg-object</code>             | Java* Object argument                                       |
| <code>arg-password</code>           | Password argument.  |
| <code>arg-string</code>             | String argument   |
| <code>arg-value</code>              | Value argument.   |
| <code>comment</code>                | Long description of a rule.                                 |
| <code>component</code>              | Value component.  |
| <code>conditions</code>             | Conditions under which the actions of a rule are performed. |
| <code>description</code>            | Description of a policy or a rule.                          |
| <code>do-add-association</code>     | Associates the current object.                              |
| <code>do-add-dest-attr-value</code> | Adds a value to an attribute in the destination data store. |
| <code>do-add-dest-object</code>     | Adds an object in the destination data store.               |
| <code>do-add-role</code>            | Adds a role assignment to a specified object.               |

| Element                   | Description   |
|---------------------------|---|
| do-add-src-attr-value     | Adds a value to an attribute in the source data store.                                    |
| do-add-src-object         | Adds an object in the source data store.  |
| do-append-xml-element     | Appends a custom XML element to existing elements.  |
| do-append-xml-text        | Appends custom XML text to existing elements.   |
| do-break                  | Stops processing the current operation with this policy.                                  |
| do-clear-dest-attr-value  | Clears all values of an attribute in the destination data store.                          |
| do-clear-op-property      | Clears an operation property.   |
| do-clear-src-attr-value   | Clears all values of an attribute in the source data store.                               |
| do-clear-sso-credential   | Clears a credential in an SSO credential store.   |
| do-clone-op-attr          | Applies all operations on an attribute in the current operation to a different attribute. |
| do-clone-xpath            | Clones and appends a set of nodes to existing elements.                                   |
| do-delete-dest-object     | Deletes an object in the destination data store.  |
| do-delete-src-object      | Deletes an object in the source data store.   |
| do-find-matching-object   | Automatically associates the current object.  |
| do-for-each               | Repeats actions for each node in a node set.  |
| do-generate-event         | Generates a user-defined event.   |
| do-if                     | Conditionally perform actions.  |
| do-implement-entitlement  | Implements an entitlement.  |
| do-move-dest-object       | Moves an object in the destination data store.  |
| do-move-src-object        | Moves an object in the source data store.   |
| do-reformat-op-attr       | Changes the format of all values of a particular attribute in the current operation.      |
| do-remove-association     | Disassociates an application object.  |
| do-remove-dest-attr-value | Removes a value from an attribute in the destination data store.                          |
| do-remove-role            | Removes a role assignment from a specified object.  |
| do-remove-src-attr-value  | Removes a value from an attribute in the source data store.                               |
| do-rename-dest-object     | Renames an object in the destination data store.  |

| Element                          | Description   |
|----------------------------------|---|
| do-rename-op-attr                | Changes an attribute name for all operations on that attribute in the current operation.  |
| do-rename-src-object             | Renames an object in the source data store.   |
| do-send-email                    | Generates an e-mail notification.   |
| do-send-email-from-template      | Generates an e-mail notification using SMTP configuration and e-mail template objects.    |
| do-set-default-attr-value        | Sets the default value for an attribute created in the destination data store             |
| do-set-dest-attr-value           | Sets the value of an attribute in the destination data store.                             |
| do-set-dest-password             | Sets the password for the current object in the destination data store.                   |
| do-set-local-variable            | Sets the value of a local variable.   |
| do-set-op-association            | Sets that association value for the current operation.                                    |
| do-set-op-class-name             | Sets the object class name for the current operation.                                     |
| do-set-op-dest-dn                | Sets the destination DN for the current operation.  |
| do-set-op-property               | Sets an operation property.   |
| do-set-op-src-dn                 | Sets the source DN for the current operation.   |
| do-set-op-template-dn            | Sets the template DN for the current add operation.                                       |
| do-set-src-attr-value            | Sets the value of an attribute in the source data store.                                  |
| do-set-src-password              | Sets the password for the current object in the source data store.                        |
| do-set-sso-credential            | Sets a credential in an SSO credential store.   |
| do-set-sso-passphrase            | Sets a passphrase in an SSO credential store.   |
| do-set-xml-attr                  | Sets custom XML attributes on existing elements.  |
| do-start-workflow                | Starts a workflow.  |
| do-status                        | Reports status.   |
| do-strip-op-attr                 | Strips an attribute from the current operation.   |
| do-strip-xpath                   | Strips arbitrary data from the current operation  |
| do-trace-message                 | Sends a trace message.  |
| do-veto                          | Vetoes the current operation.   |
| do-veto-if-op-attr-not-available | Vetoes the current operation if a particular attribute is not available in the operation. |

| Element                 | Description   |
|-------------------------|---|
| do-while                | Repeat actions while a condition is true.   |
| if-association          | Tests an association.   |
| if-attr                 | Tests an attribute in the current operation or the current object in the source data store.     |
| if-class-name           | Tests the object class of the current operation.  |
| if-dest-attr            | Tests an attribute of the current object in the destination data store.                         |
| if-dest-dn              | Tests the destination DN of the current operation.  |
| if-entitlement          | Tests an entitlement of the current object.   |
| if-global-variable      | Tests a global variable.  |
| if-local-variable       | Tests a local variable.   |
| if-named-password       | Tests a named password.   |
| if-op-attr              | Tests an attribute in the current operation.  |
| if-op-property          | Tests an operation property.  |
| if-operation            | Tests the name of the current operation.  |
| if-password             | Tests the password of the current operation.  |
| if-src-attr             | Tests an attribute of current object in the source data store.                                  |
| if-src-dn               | Tests the source DN of the current operation.   |
| if-xml-attr             | Tests an XML attribute of the current operation.  |
| if-xpath                | Tests an XPath expression.  |
| include                 | Includes rules from another policy.   |
| or                      | Logical disjunction.  |
| policy                  | A policy.   |
| rule                    | Rules within a policy.  |
| token-added-entitlement | The values of an entitlement granted in the current operation.                                  |
| token-association       | The association value from the current operation.   |
| token-attr              | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode     | Decodes base64 data into a string.  |
| token-base64-encode     | Encodes a string into base64 data.  |
| token-char              | A Unicode character.  |
| token-class-name        | The object class name from the current operation  |
| token-convert-time      | Converts a date/time from one format to another.  |

| Element                   | Description   |
|---------------------------|---|
| token-dest-attr           | The values of an attribute of current object in the destination data store.     |
| token-dest-dn             | A value derived from the destination DN from the current operation.             |
| token-dest-name           | The unqualified RDN derived from the destination DN from the current operation. |
| token-document            | Reads an XML document.  |
| token-entitlement         | The values of a granted entitlement of the current object.                      |
| token-escape-for-dest-dn  | Converts a string for use in a destination DN.                                  |
| token-escape-for-src-dn   | Converts a string for use in a source DN.                                       |
| token-generate-password   | Generates a random password.  |
| token-global-variable     | The value of a global variable.   |
| token-join                | Joins a node-set into a string.   |
| token-local-variable      | The value of a local variable.  |
| token-lower-case          | Converts a string to lowercase.   |
| token-map                 | Maps a string through a mapping table.  |
| token-named-password      | The value of the named password.  |
| token-op-attr             | The values of an attribute in the current operation.                            |
| token-op-property         | The value of an operation property.   |
| token-operation           | The name of the current operation.  |
| token-parse-dn            | Parses or converts a DN.  |
| token-password            | The value of the password in the current operation.                             |
| token-query               | Queries the source or destination data store.                                   |
| token-removed-attr        | The values of an attribute removed in the current operation.                    |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.                  |
| token-replace-all         | Replaces all instances of a substring within a string.                          |
| token-replace-first       | Replaces a single instance of a substring within a string.                      |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.              |
| token-split               | Splits a string into a node set.  |
| token-src-attr            | The values of an attribute of the current object in the source data store.      |

| Element                | Description  |
|------------------------|--|
| token-src-dn           | A value derived from the source DN from the current operation.         |
| token-src-name         | The unqualified RDN derived from source DN from the current operation. |
| token-substring        | Substring of a string.   |
| token-text             | Constant text.   |
| token-time             | The current date/time.   |
| token-unique-name      | Generates a unique name.   |
| token-unmatched-src-dn | A DN relative to the one matched by <code>if-src-dn</code> .           |
| token-upper-case       | Converts a string to uppercase.  |
| token-xml-parse        | Parses XML.  |
| token-xml-serialize    | Serializes XML.  |
| token-xpath            | The result of an XPath expression.                                     |

# actions

The <actions> that are performed when <conditions> of the enclosing <rule> are met. All individual <actions> are represented by an element of the form <do-\*>.

## Remarks

Most actions take arguments that further describe the action to be taken. Arguments that take a fixed string that never changes at runtime are represented by attributes on the action element. Arguments that can be re-evaluated at runtime are represented by child elements of the form <arg-\*>. The content of most of these arguments consists of a set of tokens represented by elements of the form <token-\*> (exceptions are noted on the documentation for the individual arguments). The individual tokens are expanded at runtime based on the rule evaluation context and the results of the expansion and are concatenated together to form the actual argument.

## Example

See <policy>.

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| do-add-association       | Associates the current object.  |
| do-add-dest-attr-value   | Adds a value to an attribute in the destination data store.                               |
| do-add-dest-object       | Adds an object in the destination data store.   |
| do-add-src-attr-value    | Adds a value to an attribute in the source data store.                                    |
| do-add-src-object        | Adds an object in the source data store.  |
| do-append-xml-element    | Appends a custom XML element to existing elements.  |
| do-append-xml-text       | Appends custom XML text to existing elements.   |
| do-break                 | Stops processing the current operation with this policy.                                  |
| do-clear-dest-attr-value | Clears all values of an attribute in the destination data store.                          |
| do-clear-op-property     | Clears an operation property.   |
| do-clear-src-attr-value  | Clears all values of an attribute in the source data store.                               |
| do-clear-sso-credential  | Clears a credential in an SSO credential store.   |
| do-clone-op-attr         | Applies all operations on an attribute in the current operation to a different attribute. |

| Element                     | Description  |
|-----------------------------|--|
| do-clone-xpath              | Clones and appends a set of nodes to existing elements.                                  |
| do-delete-dest-object       | Deletes an object in the destination data store.   |
| do-delete-src-object        | Deletes an object in the source data store.  |
| do-find-matching-object     | Automatically associates the current object.   |
| do-for-each                 | Repeats actions for each node in a node set.   |
| do-generate-event           | Generates a user-defined event.  |
| do-if                       | Conditionally perform actions.   |
| do-implement-entitlement    | Implements an entitlement.   |
| do-move-dest-object         | Moves an object in the destination data store.   |
| do-move-src-object          | Moves an object in the source data store.  |
| do-reformat-op-attr         | Changes the format of all values of a particular attribute in the current operation.     |
| do-remove-association       | Disassociates an application object.   |
| do-remove-dest-attr-value   | Removes a value from an attribute in the destination data store.                         |
| do-remove-src-attr-value    | Removes a value from an attribute in the source data store.                              |
| do-rename-dest-object       | Renames an object in the destination data store.   |
| do-rename-op-attr           | Changes an attribute name for all operations on that attribute in the current operation. |
| do-rename-src-object        | Renames an object in the source data store.  |
| do-send-email               | Generates an e-mail notification.  |
| do-send-email-from-template | Generates an e-mail notification using SMTP configuration and e-mail template objects.   |
| do-set-default-attr-value   | Sets the default value for an attribute created in the destination data store            |
| do-set-dest-attr-value      | Sets the value of an attribute in the destination data store.                            |
| do-set-dest-password        | Sets the password for the current object in the destination data store.                  |
| do-set-local-variable       | Sets the value of a local variable.  |
| do-set-op-association       | Sets that association value for the current operation.                                   |
| do-set-op-class-name        | Sets the object class name for the current operation.                                    |
| do-set-op-dest-dn           | Sets the destination DN for the current operation.                                       |



| Element                                       | Description   |
|---|---|
| <code>do-set-op-property</code>               | Sets an operation property.   |
| <code>do-set-op-src-dn</code>                 | Sets the source DN for the current operation.   |
| <code>do-set-op-template-dn</code>            | Sets the template DN for the current add operation.                                       |
| <code>do-set-src-attr-value</code>            | Sets the value of an attribute in the source data store.                                  |
| <code>do-set-src-password</code>              | Sets the password for the current object in the source data store.                        |
| <code>do-set-sso-credential</code>            | Sets a credential in an SSO credential store.   |
| <code>do-set-sso-passphrase</code>            | Sets a passphrase in an SSO credential store.   |
| <code>do-set-xml-attr</code>                  | Sets custom XML attributes on existing elements.  |
| <code>do-start-workflow</code>                | Starts a workflow.  |
| <code>do-status</code>                        | Reports status.   |
| <code>do-strip-op-attr</code>                 | Strips an attribute from the current operation.   |
| <code>do-strip-xpath</code>                   | Strips arbitrary data from the current operation  |
| <code>do-trace-message</code>                 | Sends a trace message.  |
| <code>do-veto</code>                          | Vetoes the current operation.   |
| <code>do-veto-if-op-attr-not-available</code> | Vetoes the current operation if a particular attribute is not available in the operation. |
| <code>do-while</code>                         | Repeat actions while a condition is true.   |

## Attributes

None

## Content Rule

( `do-add-association` | `do-add-dest-attr-value` | `do-add-dest-object` | `do-add-src-attr-value` | `do-add-src-object` | `do-append-xml-element` | `do-append-xml-text` | `do-break` | `do-clear-dest-attr-value` | `do-clear-op-property` | `do-clear-src-attr-value` | `do-clear-sso-credential` | `do-clone-op-attr` | `do-clone-xpath` | `do-delete-dest-object` | `do-delete-src-object` | `do-find-matching-object` | `do-for-each` | `do-generate-event` | `do-if` | `do-implement-entitlement` | `do-move-dest-object` | `do-move-src-object` | `do-reformat-op-attr` | `do-remove-association` | `do-remove-dest-attr-value` | `do-remove-src-attr-value` | `do-rename-dest-object` | `do-rename-op-attr` | `do-rename-src-object` | `do-send-email` | `do-send-email-from-template` | `do-set-default-attr-value` | `do-set-dest-attr-value` | `do-set-dest-password` | `do-set-local-variable` | `do-set-op-association` | `do-set-op-class-name` | `do-set-op-dest-dn` | `do-set-op-property` | `do-set-op-src-dn` | `do-set-op-template-dn` | `do-set-src-attr-value` | `do-set-src-password` | `do-set-sso-credential` | `do-set-sso-passphrase` | `do-set-xml-attr` | `do-start-workflow` | `do-status` | `do-strip-op-attr` | `do-strip-xpath` | `do-trace-message` | `do-veto` | `do-veto-if-op-attr-not-available` | `do-while` ) \*

## Parent Elements

| Element           | Description           |
|-------------------|-----------------------|
| <code>rule</code> | Rule within a policy. |

# and

Specifies a set of tests that are performed and whose results are logically ANDed together. A set of <and> elements enclosed by a <conditions> are ORed together.

## Example

See <policy>.

## Allowed Content

| Element            | Description   |
|--------------------|---|
| if-association     | Tests an association.   |
| if-attr            | Tests an attribute in the current operation or the current object in the source data store. |
| if-class-name      | Tests the object class of the current operation.  |
| if-dest-attr       | Tests an attribute of the current object in the destination data store.                     |
| if-dest-dn         | Tests the destination DN of the current operation.  |
| if-entitlement     | Tests an entitlement of the current object.   |
| if-global-variable | Tests a global variable.  |
| if-local-variable  | Tests a local variable.   |
| if-named-password  | Tests a named password.   |
| if-op-attr         | Tests an attribute in the current operation.  |
| if-op-property     | Tests an operation property.  |
| if-operation       | Tests the name of the current operation.  |
| if-password        | Tests the password of the current operation.  |
| if-src-attr        | Tests an attribute of current object in the source data store.                              |
| if-src-dn          | Tests the source DN of the current operation.   |
| if-xml-attr        | Tests an XML attribute of the current operation.  |
| if-xpath           | Tests an XPath expression.  |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.                                     | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of policy. | false         |

## Content Rule

( if-association | if-attr | if-class-name | if-dest-attr | if-dest-dn | if-entitlement | if-global-variable | if-local-variable | if-named-password | if-op-attr | if-op-property | if-operation | if-password | if-src-attr | if-src-dn | if-xml-attr | if-xpath ) \*

## Parent Elements

| Element               | Description  |
|-----------------------|--|
| <b>arg-conditions</b> | Conditions argument.   |
| <b>conditions</b>     | Conditions under which the actions of a <b>&lt;rule&gt;</b> are performed. |

# arg-actions

Specifies the actions that are performed for each iteration of the enclosing `<do-for-each>`. It is different from other argument types because it contains actions instead of tokens.

## Example

See `<do-for-each>`, `<do-if>`, `<do-while>`, `<do-implement-entitlement>`.

## Allowed Content

| Element                               | Description   |
|---------------------------------------|---|
| <code>do-add-association</code>       | Associates the current object.  |
| <code>do-add-dest-attr-value</code>   | Adds a value to an attribute in the destination data store.                               |
| <code>do-add-dest-object</code>       | Adds an object in the destination data store.   |
| <code>do-add-src-attr-value</code>    | Adds a value to an attribute in the source data store.                                    |
| <code>do-add-src-object</code>        | Adds an object in the source data store.  |
| <code>do-append-xml-element</code>    | Appends a custom XML element to existing elements.  |
| <code>do-append-xml-text</code>       | Appends custom XML text to existing elements.   |
| <code>do-break</code>                 | Stops processing the current operation with this policy.                                  |
| <code>do-clear-dest-attr-value</code> | Clears all values of an attribute in the destination data store.                          |
| <code>do-clear-op-property</code>     | Clears an operation property.   |
| <code>do-clear-src-attr-value</code>  | Clears all values of an attribute in the source data store.                               |
| <code>do-clear-sso-credential</code>  | Clears a credential in an SSO credential store.   |
| <code>do-clone-op-attr</code>         | Applies all operations on an attribute in the current operation to a different attribute. |
| <code>do-clone-xpath</code>           | Clones and appends a set of nodes to existing elements.                                   |
| <code>do-delete-dest-object</code>    | Deletes an object in the destination data store.  |
| <code>do-delete-src-object</code>     | Deletes an object in the source data store.   |
| <code>do-find-matching-object</code>  | Automatically associates the current object.  |
| <code>do-for-each</code>              | Repeats actions for each node in a node set.  |
| <code>do-generate-event</code>        | Generates a user-defined event.   |

| Element                     | Description  |
|-----------------------------|--|
| do-if                       | Conditionally perform actions.   |
| do-implement-entitlement    | Implements an entitlement.   |
| do-move-dest-object         | Moves an object in the destination data store.   |
| do-move-src-object          | Moves an object in the source data store.  |
| do-reformat-op-attr         | Changes the format of all values of a particular attribute in the current operation.     |
| do-remove-association       | Disassociates an application object.   |
| do-remove-dest-attr-value   | Removes a value from an attribute in the destination data store.                         |
| do-remove-src-attr-value    | Removes a value from an attribute in the source data store.                              |
| do-rename-dest-object       | Renames an object in the destination data store.   |
| do-rename-op-attr           | Changes an attribute name for all operations on that attribute in the current operation. |
| do-rename-src-object        | Renames an object in the source data store.  |
| do-send-email               | Generates an e-mail notification.  |
| do-send-email-from-template | Generates an e-mail notification using SMTP configuration and e-mail template objects.   |
| do-set-dest-attr-value      | Sets the default value for an attribute created in the destination data store            |
| do-set-dest-attr-value      | Sets the value of an attribute in the destination data store.                            |
| do-set-dest-password        | Sets the password for the current object in the destination data store.                  |
| do-set-local-variable       | Sets the value of a local variable.  |
| do-set-op-association       | Sets that association value for the current operation.                                   |
| do-set-op-class-name        | Sets the object class name for the current operation.                                    |
| do-set-op-dest-dn           | Sets the destination DN for the current operation.                                       |
| do-set-op-property          | Sets an operation property.  |
| do-set-op-src-dn            | Sets the source DN for the current operation.  |
| do-set-op-template-dn       | Sets the template DN for the current add operation.                                      |
| do-set-src-attr-value       | Sets the value of an attribute in the source data store.                                 |
| do-set-src-password         | Sets the password for the current object in the source data store.                       |

| Element                                       | Description   |
|---|---|
| <code>do-set-sso-credential</code>            | Sets a credential in an SSO credential store.   |
| <code>do-set-sso-passphrase</code>            | Sets a passphrase in an SSO credential store.   |
| <code>do-set-xml-attr</code>                  | Sets custom XML attributes on existing elements.  |
| <code>do-start-workflow</code>                | Starts a workflow.  |
| <code>do-status</code>                        | Reports status.   |
| <code>do-strip-op-attr</code>                 | Strips an attribute from the current operation.   |
| <code>do-strip-xpath</code>                   | Strips arbitrary data from the current operation  |
| <code>do-trace-message</code>                 | Sends a trace message.  |
| <code>do-veto</code>                          | Vetoes the current operation.   |
| <code>do-veto-if-op-attr-not-available</code> | Vetoes the current operation if a particular attribute is not available in the operation. |
| <code>do-while</code>                         | Repeat actions while a condition is true.   |

## Attributes

None

## Content Rule

( `do-add-association` | `do-add-dest-attr-value` | `do-add-dest-object` | `do-add-src-attr-value` | `do-add-src-object` | `do-append-xml-element` | `do-append-xml-text` | `do-break` | `do-clear-dest-attr-value` | `do-clear-op-property` | `do-clear-src-attr-value` | `do-clear-sso-credential` | `do-clone-op-attr` | `do-clone-xpath` | `do-delete-dest-object` | `do-delete-src-object` | `do-find-matching-object` | `do-for-each` | `do-generate-event` | `do-if` | `do-implement-entitlement` | `do-move-dest-object` | `do-move-src-object` | `do-reformat-op-attr` | `do-remove-association` | `do-remove-dest-attr-value` | `do-remove-src-attr-value` | `do-rename-dest-object` | `do-rename-op-attr` | `do-rename-src-object` | `do-send-email` | `do-send-email-from-template` | `do-set-default-attr-value` | `do-set-dest-attr-value` | `do-set-dest-password` | `do-set-local-variable` | `do-set-op-association` | `do-set-op-class-name` | `do-set-op-dest-dn` | `do-set-op-property` | `do-set-op-src-dn` | `do-set-op-template-dn` | `do-set-src-attr-value` | `do-set-src-password` | `do-set-sso-credential` | `do-set-sso-passphrase` | `do-set-xml-attr` | `do-start-workflow` | `do-status` | `do-strip-op-attr` | `do-strip-xpath` | `do-trace-message` | `do-veto` | `do-veto-if-op-attr-not-available` | `do-while` ) \*

## Parent Elements

| Element                               | Description                                  |
|---------------------------------------|--|
| <code>do-for-each</code>              | Repeats actions for each node in a node set. |
| <code>do-if</code>                    | Conditionally perform actions.               |
| <code>do-implement-entitlement</code> | Implements an entitlement.                   |
| <code>do-while</code>                 | Repeats actions while a condition is True.   |

# arg-association

Specifies an association value for the enclosing action. Each of the enclosed tokens is evaluated and the resulting string values are concatenated to form an association value.

## Example

See `<do-add-association>`.

## Allowed Content

| Element                               | Description   |
|---------------------------------------|---|
| <code>token-added-entitlement</code>  | The values of an entitlement granted in the current operation.                                  |
| <code>token-association</code>        | The association value from the current operation.   |
| <code>token-attr</code>               | The values of an attribute in the current operation or current object in the source data store. |
| <code>token-base64-decode</code>      | Decodes base64 data into a string.  |
| <code>token-base64-encode</code>      | Encodes a string into base64 data.  |
| <code>token-char</code>               | A Unicode character.  |
| <code>token-class-name</code>         | The object class name from the current operation  |
| <code>token-convert-time</code>       | Converts a date/time from one format to another.  |
| <code>token-dest-attr</code>          | The values of an attribute of current object in the destination data store.                     |
| <code>token-dest-dn</code>            | A value derived from the destination DN from the current operation.                             |
| <code>token-dest-name</code>          | The unqualified RDN derived from the destination DN from the current operation.                 |
| <code>token-document</code>           | Reads an XML document.  |
| <code>token-entitlement</code>        | The values of a granted entitlement of the current object.                                      |
| <code>token-escape-for-dest-dn</code> | Converts a string for use in a destination DN.  |
| <code>token-escape-for-src-dn</code>  | Converts a string for use in a source DN.   |
| <code>token-generate-password</code>  | Generates a random password.  |
| <code>token-global-variable</code>    | The value of a global variable.   |
| <code>token-join</code>               | Joins a node-set into a string.   |
| <code>token-local-variable</code>     | The value of a local variable.  |
| <code>token-lower-case</code>         | Converts a string to lowercase.   |



| Element                   | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

None

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) \*

## Parent Elements

| Element                   | Description  |
|---------------------------|--|
| do-add-association        | Associates the current object.                                   |
| do-add-dest-attr-value    | Adds a value to an attribute in the destination data store.      |
| do-add-src-attr-value     | Adds a value to an attribute in the source data store.           |
| do-clear-dest-attr-value  | Clears all values of an attribute in the destination data store. |
| do-clear-src-attr-value   | Clears all values of an attribute in the source data store.      |
| do-delete-dest-object     | Deletes an object in the destination data store.                 |
| do-delete-src-object      | Deletes an object in the source data store.                      |
| do-move-dest-object       | Moves an object in the destination data store.                   |
| do-move-src-object        | Moves an object in the source data store.                        |
| do-remove-association     | Disassociates an application object.                             |
| do-remove-dest-attr-value | Removes a value from an attribute in the destination data store. |
| do-remove-src-attr-value  | Removes a value from an attribute in the source data store.      |
| do-rename-dest-object     | Renames an object in the destination data store.                 |
| do-rename-src-object      | Renames an object in the source data store.                      |
| do-set-dest-attr-value    | Sets the value of an attribute in the destination data store.    |

| Element               | Description   |
|-----------------------|---|
| do-set-dest-password  | Sets the password for the current object in the destination data store.         |
| do-set-op-association | Sets that association value for the current operation.                          |
| do-set-src-attr-value | Sets the value of an attribute in the source data store.                        |
| do-set-src-password   | Sets the password for the current object in the source data store.              |
| token-dest-attr       | The values of an attribute of the current object in the destination data store. |
| token-query           | Queries the source or destination data store.                                   |
| token-resolve         | Resolves a DN to an association key or an association key to a DN.              |
| token-src-attr        | The values of an attribute of the current object in the source data store.      |
| token-unique-name     | Generates a unique name.  |

# arg-component

Provides values for components of the enclosing **<arg-value>** if the type attribute of **<arg-value>** is structured. Each of the enclosed tokens is evaluated and the resulting string values are concatenated to form the value of the component. The name of the component is specified by the name attribute.

## Example

See **<arg-value>**.

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |
| token-lower-case         | Converts a string to lowercase.   |

| Element                   | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the component.<br>Supports variable expansion. | #REQUIRED     |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) \*

## Parent Elements

| Element          | Description     |
|------------------|-----------------|
| <b>arg-value</b> | Value argument. |

# arg-conditions

Specifies the conditions associated with the enclosing action. It is different from other argument types in that it contains conditions instead of tokens.

## Example

See `<do-if>`, `<do-while>`.

## Allowed Content

| Element          | Description            |
|------------------|------------------------|
| <code>and</code> | A logical conjunction. |
| <code>or</code>  | A logical disjunction. |

## Attributes

None

## Content Rule

( `and` \* | `or` \* )

## Parent Elements

| Element               | Description                                |
|-----------------------|--|
| <code>do-if</code>    | Conditionally perform actions.             |
| <code>do-while</code> | Repeats actions while a condition is True. |

# arg-dn

Specifies a DN value for the enclosing action. Each of the enclosed tokens is evaluated and the resulting string values are concatenated to form a DN value.

## Example

See `<do-add-association>`.

## Allowed Content

| Elements                              | Description   |
|---------------------------------------|---|
| <code>token-added-entitlement</code>  | The values of an entitlement granted in the current operation.                                      |
| <code>token-association</code>        | The association value from the current operation.   |
| <code>token-attr</code>               | The values of an attribute in the current operation or the current object in the source data store. |
| <code>token-base64-decode</code>      | Decodes base64 data into a string.  |
| <code>token-base64-encode</code>      | Encodes a string into base64 data.  |
| <code>token-char</code>               | A Unicode character.  |
| <code>token-class-name</code>         | The object class name from the current operation.   |
| <code>token-convert-time</code>       | Converts a date/time from one format to another.  |
| <code>token-dest-attr</code>          | The values of an attribute of the current object in the destination data store.                     |
| <code>token-dest-dn</code>            | A value derived from the destination DN from the current object.                                    |
| <code>token-dest-name</code>          | The unqualified RDN derived from destination DN from the current operation.                         |
| <code>token-document</code>           | Reads an XML document.  |
| <code>token-entitlement</code>        | The values of a granted entitlement of the current object.  |
| <code>token-escape-for-dest-dn</code> | Converts a string for use in a destination DN.  |
| <code>token-escape-for-src-dn</code>  | Converts a string for use in a source DN.   |
| <code>token-generate-password</code>  | Generates a random password.  |
| <code>token-global-variable</code>    | The value of a global variable.   |
| <code>token-join</code>               | Joins a node set into a string.   |
| <code>token-local-variable</code>     | The value of a local variable.  |
| <code>token-lower-case</code>         | Converts a string to lowercase.   |



| Elements                  | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source of destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from the source DN from the current operation. |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | A generated unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

None

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) \*

## Parent Elements

| Element                   | Description   |
|---------------------------|---|
| do-add-association        | Associates the current object.  |
| do-add-dest-attr-value    | Adds a value to an attribute in the destination data store.             |
| do-add-src-attr-value     | Adds a value to an attribute in the source data store.                  |
| do-clear-dest-attr-value  | Clears all values of an attribute in the destination data store.        |
| do-clear-src-attr-value   | Clears all values of an attribute in the source data store.             |
| do-clear-sso-credential   | Clears a credential in an SSO credential store.                         |
| do-delete-dest-object     | Deletes an object in the destination data store.                        |
| do-delete-src-object      | Deletes an object in the source data store.                             |
| do-find-matching-object   | Automatically associates the current object.                            |
| do-move-dest-object       | Moves an object in the destination data store.                          |
| do-move-src-object        | Moves an object in the source data store.                               |
| do-remove-association     | Disassociates an application object.                                    |
| do-remove-dest-attr-value | Removes a value from an attribute in the destination data store.        |
| do-remove-src-attr-value  | Removes a value from an attribute in the source data store.             |
| do-rename-dest-object     | Renames an object in the destination data store.                        |
| do-rename-src-object      | Renames an object in the source data store.                             |
| do-set-dest-attr-value    | Sets the value of an attribute in the destination data store.           |
| do-set-dest-password      | Sets the password for the current object in the destination data store. |

| Element               | Description   |
|-----------------------|---|
| do-set-op-dest-dn     | Sets the destination DN for the current operation.                              |
| do-set-op-src-dn      | Sets the source DN for the current operation                                    |
| do-set-op-template-dn | Sets the template DN for the current add operation.                             |
| do-set-src-attr-value | Sets the value of an attribute in the source data store.                        |
| do-set-src-password   | Sets the password for the current object in the source data store.              |
| do-set-sso-credential | Sets a credential in an SSO credential store.                                   |
| do-set-sso-passphrase | Sets a passphrase in an SSO credential store.                                   |
| do-start-workflow     | Starts a workflow.  |
| token-dest-attr       | The values of an attribute of the current object in the destination data store. |
| token-query           | Queries the source or destination data store.                                   |
| token-resolve         | Resolves a DN to an association key or an association key to a DN.              |
| token-src-attr        | The values of an attribute of the current object in the source data store.      |
| token-unique-name     | Generates a unique name.  |

## arg-match-attr

Specifies the attributes to be used to find a match for the enclosing `<do-find-matching-object>`. The name attribute provides the name of the attribute to use for matching. If there is an enclosed `<arg-value>`, then it provides the attribute value to use for matching, otherwise the values are from the values available in the current operation.

### Example

See `<do-find-matching-object>`.

### Allowed Content

| Element                | Description        |
|------------------------|--------------------|
| <code>arg-value</code> | An argument value. |

### Attributes

| Attribute | Possible Values                 | Default Value |
|-----------|---------------------------------|---------------|
| name      | CDATA<br>Name of the attribute. | #REQUIRED     |

### Content Rule

( arg-value ? )

### Parent Elements

| Element                              | Description                                   |
|--------------------------------------|---|
| <code>do-find-matching-object</code> | Automatically associates the current object.  |
| <code>token-query</code>             | Queries the source or destination data store. |

# arg-node-set

Specifies an XPath 1.0 node set for the enclosing action. Each of the enclosed tokens are evaluated and if the token returns a node set then the nodes in that set are added to the result set otherwise, a text node is created and added to the node set.

## Example

See <do-for-each>.

## Allowed Content

| Elements                 | Description  |
|--------------------------|--|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                       |
| token-association        | The association value from the current operation.  |
| token-attr               | The values of an attribute in the current operation or the current object in the source data source. |
| token-base64-decode      | Decodes base64 data into a string.   |
| token-base64-encode      | Encodes a string into base64 data.   |
| token-char               | A Unicode character.   |
| token-class-name         | The object class name from the current operation.  |
| token-convert-time       | Converts a date/time from one format to another.   |
| token-dest-attr          | The values of an attribute of the current object in the destination data store.                      |
| token-dest-dn            | A value derived from the destination DN from the current operation.                                  |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                      |
| token-document           | Reads an XML document.   |
| token-entitlement        | The values of a granted entitlement of the current object.   |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.   |
| token-escape-for-src-dn  | Converts a string for use in a source DN.  |
| token-generate-password  | Generates a random password.   |
| token-global-variable    | The value of a global variable.  |
| token-join               | Joins a node set into a string.  |
| token-local-variable     | The value of a local variable.   |
| token-lower-case         | Converts a string to lowercase.  |

| Elements                  | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses and converts a DN.  |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an entitlement revoked in the current operation.             |
| token-removed-entitlement | The values of an attribute removed in the current operation.               |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from the source DN from the current operation. |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | A generated unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

None

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath | token-query | token-split ) \*

## Parent Elements

| Element                               | Description                                  |
|---------------------------------------|--|
| <code>do-for-each</code>              | Repeats actions for each node in a node set. |
| <code>do-implement-entitlement</code> | Implements an entitlement.                   |
| <code>do-set-local-variable</code>    | Sets the value of a local variable.          |

# arg-object

Specifies a Java object for storing in the local variable specified by the enclosing `<do-set-local-variable>` action. The enclosed token must a `<token-xpath>` that specifies an expression that returns a Java object or a `<token-local-variable>` for a variable that already contains a Java object.

## Example

See `<do-set-local-variable>`.

## Allowed Content

| Element                           | Description                        |
|-----------------------------------|------------------------------------|
| <code>token-local-variable</code> | The value of a local variable.     |
| <code>token-xpath</code>          | The result of an XPath expression. |

## Attributes

None

## Content Rule

( `token-local-variable` | `token-xpath` )

## Parent Elements

| Element                            | Description                         |
|------------------------------------|-------------------------------------|
| <code>do-set-local-variable</code> | Sets the value of a local variable. |



# arg-password

Specifies a password to be used by the enclosing action. Each of the enclosed tokens is evaluated and the resulting string values are concatenated to form a string value.

## Example

See [do-start-workflow](#).

## Allowed Content

| Element                                  | Description  |
|--|--|
| <a href="#">token-added-entitlement</a>  | The values of an entitlement granted in the current operation.                                       |
| <a href="#">token-association</a>        | The association value from the current operation.  |
| <a href="#">token-attr</a>               | The values of an attribute in the current operation or the current object in the source data source. |
| <a href="#">token-base64-decode</a>      | Decodes base64 data into string.   |
| <a href="#">token-base64-encode</a>      | Encodes a string into base64 data.   |
| <a href="#">token-char</a>               | A Unicode character.   |
| <a href="#">token-class-name</a>         | The object class name from the current operation.  |
| <a href="#">token-convert-time</a>       | Converts date/time from one format to another.   |
| <a href="#">token-dest-attr</a>          | The values of an attribute of the current object in the destination data store.                      |
| <a href="#">token-dest-dn</a>            | A value derived from the destination DN from the current operation.                                  |
| <a href="#">token-dest-name</a>          | The unqualified RDN derived from the destination DN from the current operation.                      |
| <a href="#">token-document</a>           | Reads an XML document.   |
| <a href="#">token-entitlement</a>        | The values of a granted entitlement of the current object.   |
| <a href="#">token-escape-for-dest-dn</a> | Converts a string for use in a destination DN.   |
| <a href="#">token-escape-for-src-dn</a>  | Converts a string for use in a source DN.  |
| <a href="#">token-generate-password</a>  | Generates a random password.   |
| <a href="#">token-global-variable</a>    | The value of a global variable.  |
| <a href="#">token-join</a>               | Joins a node set into a string.  |
| <a href="#">token-local-variable</a>     | The value of a local variable.   |
| <a href="#">token-lower-case</a>         | Converts a string to lower case.   |

| Element                   | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from the source DN from the current operation. |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | A generated unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to upper case.   |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serialize XML.   |
| token-xpath               | The result of an XPath expression.   |

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |
| token-lower-case         | Converts a string to lowercase.   |
| token-map                | Maps a string through a mapping table.  |
| token-named-password     | The value of the named password.  |
| token-op-attr            | The values of an attribute in the current operation.  |
| token-op-property        | The value of an operation property.   |
| token-operation          | The name of the current operation.  |
| token-parse-dn           | Parses or converts a DN.  |
| token-password           | The value of the password in the current operation.   |
| token-query              | Queries the source or destination data store.   |

| Element                                | Description  |
|--|--|
| <code>token-removed-attr</code>        | The values of an attribute removed in the current operation.               |
| <code>token-removed-entitlement</code> | The values of an entitlement revoked in the current operation.             |
| <code>token-replace-all</code>         | Replaces all instances of a substring within a string.                     |
| <code>token-replace-first</code>       | Replaces a single instance of a substring within a string.                 |
| <code>token-resolve</code>             | Resolves a DN to an association key or an association key to a DN.         |
| <code>token-split</code>               | Splits a string into a node set.   |
| <code>token-src-attr</code>            | The values of an attribute of the current object in the source data store. |
| <code>token-src-dn</code>              | A value derived from the source DN from the current operation.             |
| <code>token-src-name</code>            | The unqualified RDN derived from source DN from the current operation.     |
| <code>token-substring</code>           | Substring of a string.   |
| <code>token-text</code>                | Constant text.   |
| <code>token-time</code>                | The current date/time.   |
| <code>token-unique-name</code>         | Generates a unique name.   |
| <code>token-unmatched-src-dn</code>    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| <code>token-upper-case</code>          | Converts a string to uppercase.  |
| <code>token-xml-parse</code>           | Parses XML.  |
| <code>token-xml-serialize</code>       | Serializes XML.  |
| <code>token-xpath</code>               | The result of an XPath expression.   |

## Attributes

None

## Content Rule

( `token-added-entitlement` | `token-association` | `token-attr` | `token-base64-decode` | `token-base64-encode` | `token-char` | `token-class-name` | `token-convert-time` | `token-dest-attr` | `token-dest-dn` | `token-dest-name` | `token-document` | `token-entitlement` | `token-escape-for-dest-dn` | `token-escape-for-src-dn` | `token-global-variable` | `token-join` | `token-local-variable` | `token-lower-case` | `token-named-password` | `token-map` | `token-op-attr` | `token-op-property` | `token-operation` | `token-parse-dn` | `token-password` | `token-removed-attr` | `token-removed-entitlement` | `token-replace-all` | `token-replace-first` | `token-`

resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) \*

## Parent Elements

| Element                     | Description  |
|-----------------------------|--|
| do-send-email               | Generates an e-mail notification.  |
| do-send-email-from-template | Generates an e-mail notification using SMTP configuration and e-mail template objects. |
| do-start-workflow           | Starts a workflow.   |

# arg-string

Specifies string value for the enclosing action. Each of the enclosed tokens is evaluated and the resulting string values are concatenated to form a string value.

## Example

See `<do-set-op-class-name>`.

## Allowed Content

| Element                               | Description   |
|---------------------------------------|---|
| <code>token-added-entitlement</code>  | The values of an entitlement granted in the current operation.                                  |
| <code>token-association</code>        | The association value from the current operation.   |
| <code>token-attr</code>               | The values of an attribute in the current operation or current object in the source data store. |
| <code>token-base64-decode</code>      | Decodes base64 data into a string.  |
| <code>token-base64-encode</code>      | Encodes a string into base64 data.  |
| <code>token-char</code>               | A Unicode character.  |
| <code>token-class-name</code>         | The object class name from the current operation  |
| <code>token-convert-time</code>       | Converts a date/time from one format to another.  |
| <code>token-dest-attr</code>          | The values of an attribute of current object in the destination data store.                     |
| <code>token-dest-dn</code>            | A value derived from the destination DN from the current operation.                             |
| <code>token-dest-name</code>          | The unqualified RDN derived from the destination DN from the current operation.                 |
| <code>token-document</code>           | Reads an XML document.  |
| <code>token-entitlement</code>        | The values of a granted entitlement of the current object.                                      |
| <code>token-escape-for-dest-dn</code> | Converts a string for use in a destination DN.  |
| <code>token-escape-for-src-dn</code>  | Converts a string for use in a source DN.   |
| <code>token-generate-password</code>  | Generates a random password.  |
| <code>token-global-variable</code>    | The value of a global variable.   |
| <code>token-join</code>               | Joins a node-set into a string.   |
| <code>token-local-variable</code>     | The value of a local variable.  |
| <code>token-lower-case</code>         | Converts a string to lowercase.   |

| Element                   | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the argument. Supports variable expansion. | #IMPLIED      |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) \*

## Parent Elements

| Element                     | Description  |
|-----------------------------|--|
| do-append-xml-text          | Appends custom XML text to existing elements.  |
| do-clear-sso-credential     | Clears a credential in an SSO credential store.  |
| do-generate-event           | Generates a user-defined event.  |
| do-rename-dest-object       | Renames an object in the destination data store.                                       |
| do-rename-src-object        | Renames an object in the source data store.  |
| do-send-email               | Generates an e-mail notification.  |
| do-send-email-from-template | Generates an e-mail notification using SMTP configuration and e-mail template objects. |
| do-set-dest-password        | Sets the password for the current object in the destination data store.                |
| do-set-local-variable       | Sets the value of a local variable.  |
| do-set-op-class-name        | Sets the object class name for the current operation.                                  |
| do-set-op-property          | Sets an operation property.  |
| do-set-src-password         | Sets the password for the current object in the source data store.                     |
| do-set-sso-credential       | Sets a credential in an SSO credential store.  |
| do-set-sso-passphrase       | Sets a passphrase in an SSO credential store.  |



| Element           | Description                                      |
|-------------------|--|
| do-set-xml-attr   | Sets custom XML attributes on existing elements. |
| do-start-workflow | Starts a workflow.                               |
| do-status         | Reports status.                                  |
| do-trace-message  | Sends a trace message.                           |
| token-document    | Reads an XML document.                           |
| token-query       | Queries the source or destination data store.    |
| token-unique-name | Generates a unique name.                         |

# arg-value

Specifies an attribute value for the enclosing action. If the type attribute is structured, then the content of <arg-value> must be a set of <arg-component> elements. If the type attribute is other than structured, then each of the enclosed tokens is evaluated and the resulting string values are concatenated to form a value.

## Example

```
<arg-value>
  <token-attr name="Surname"/>
  <token-text>, </token-text>
  <token-attr name="Given Name"/>
</arg-value>
<arg-value type="structured">
  <arg-component name="string">
    <token-text>EN</token-text>
  </arg-component>
  <arg-component name="string">
    <token-text>JP</token-text>
  </arg-component>
</arg-value>
```

## Allowed Content

| Element                 | Description   |
|-------------------------|---|
| arg-component           | Component argument.   |
| token-added-entitlement | The values of an entitlement granted in the current operation.                                  |
| token-association       | The association value from the current operation.   |
| token-attr              | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode     | Decodes base64 data into a string.  |
| token-base64-encode     | Encodes a string into base64 data.  |
| token-char              | A Unicode character.  |
| token-class-name        | The object class name from the current operation  |
| token-convert-time      | Converts a date/time from one format to another.  |
| token-dest-attr         | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn           | A value derived from the destination DN from the current operation.                             |
| token-dest-name         | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document          | Reads an XML document.  |

| Element                   | Description  |
|---------------------------|--|
| token-entitlement         | The values of a granted entitlement of the current object.                 |
| token-escape-for-dest-dn  | Converts a string for use in a destination DN.                             |
| token-escape-for-src-dn   | Converts a string for use in a source DN.                                  |
| token-generate-password   | Generates a random password.   |
| token-global-variable     | The value of a global variable.  |
| token-join                | Joins a node-set into a string.  |
| token-local-variable      | The value of a local variable.   |
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |

| Element                             | Description  |
|-------------------------------------|--|
| <code>token-time</code>             | The current date/time.                                       |
| <code>token-unique-name</code>      | Generates a unique name.                                     |
| <code>token-unmatched-src-dn</code> | A DN relative to the one matched by <code>if-src-dn</code> . |
| <code>token-upper-case</code>       | Converts a string to uppercase.                              |
| <code>token-xml-parse</code>        | Parses XML.  |
| <code>token-xml-serialize</code>    | Serializes XML.  |
| <code>token-xpath</code>            | The result of an XPath expression.                           |

## Attributes

| Attribute         | Possible Values  | Default Value |
|-------------------|--|---------------|
| <code>type</code> | CDATA<br>Type of the value. Supports variable expansion. | string        |

## Content Rule

( arg-component + | ( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) \*

## Parent Elements

| Element                                | Description  |
|--|--|
| <code>arg-match-attr</code>            | Matches an attribute argument.   |
| <code>do-add-dest-attr-value</code>    | Adds a value to an attribute in the destination data store.                          |
| <code>do-add-src-attr-value</code>     | Adds a value to an attribute in the source data store.                               |
| <code>do-reformat-op-attr</code>       | Changes the format of all values of a particular attribute in the current operation. |
| <code>do-remove-dest-attr-value</code> | Removes a value from an attribute in the destination data store.                     |

| Element                   | Description  |
|---------------------------|--|
| do-remove-src-attr-value  | Removes a value from an attribute in the source data store.                          |
| do-set-default-attr-value | Sets the default value for an attribute to be created in the destination data store. |
| do-set-dest-attr-value    | Sets the value of an attribute in the destination data store.                        |
| do-set-src-attr-value     | Sets the value of an attribute in the source data store.                             |

# comment

A long description or other textual information relating to the containing `<rule>`. It does not affect the execution of the `<rule>`.

## Remarks

A comment has a name that can have special meaning to a user interface agent that displays or edits the rule. Policy Builder currently supports one instance per rule of an unnamed comment, and one instance each of comments with the names `author`, `version`, and `lastChanged`. Additional named and unnamed comments are allowed but are ignored by Policy Builder.

## Example

See `<policy>`.

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values               | Default Value |
|-----------|-------------------------------|---------------|
| name      | CDATA<br>Name of the comment. | #IMPLIED      |

## Content Rule

( #PCDATA )

## Parent Elements

| Element           | Description           |
|-------------------|-----------------------|
| <code>rule</code> | Rule within a policy. |

# component

Provides values for components of the enclosing if-condition if the mode attribute of that conditions is structured.

## Example

See `<if-attr>`.

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the component.<br>Supports variable expansion. | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element                   | Description   |
|---------------------------|---|
| <code>if-attr</code>      | Tests an attribute in the current operation or the current object in the source data store. |
| <code>if-dest-attr</code> | Tests an attribute of the current object in the destination data store.                     |
| <code>if-op-attr</code>   | Tests an attribute in the current operation.  |
| <code>if-src-attr</code>  | Tests an attribute of the current object in the source data store.                          |

## conditions

The conditions under which the **<actions>** of the enclosing **<rule>** are performed. The **<conditions>** are always specified in Conjunctive Normal Form (CNF) or Disjunctive Normal Form (DNF). As such, the content of **<conditions>** is either a disjunction of conjunctions specified by a (possibly empty) set of **<and>** elements or a conjunction of disjunctions specified by a (possibly empty) set of **<or>** elements. The **<actions>** of the enclosing **<rule>** are only performed when the logical expression represented in CNF or DNF evaluates to true or when no conditions are specified.

## Remarks

The evaluation of the conditions uses short-circuit logic so that no additional tests are performed when it is possible to determine the resultant Boolean value of the **<conditions>**.

All individual condition tests are represented by an element of the form **<if-\* op="some operator">**.

Some condition tests have a mode parameter that indicates the algorithm to use for comparisons. The following table details the modes that are available.

| Element    | Description   |
|------------|---|
| case       | Character-by-character case-sensitive comparison.   |
| nocase     | Character-by-character case-insensitive comparison.   |
| regex      | Regular expression match of the entire string. Case-insensitive by default, but can be changed by an escape in the expression. See <a href="http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html">http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html</a> and <a href="http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#matches()">http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#matches()</a> .<br><br>Pattern options CASE_INSENSITIVE, DOTALL, and UNICODE_CASE are used but can be reversed using the appropriate embedded escapes. |
| src-dn     | Compares using semantics appropriate to the DN format for the source data store.  |
| dest-dn    | Compares using semantics appropriate to the DN format for the destination data store.   |
| numeric    | Compares numerically.   |
| octet      | Compares octet (Base64-encoded) values.   |
| structured | Compares structured attributes according to the comparison rules for the structured syntax of the attribute.  |

## Example

See **<policy>**.



## Allowed Content

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

## Attributes

None

## Content Rule

( and \* | or \* )

## Parent Elements

| Element | Description           |
|---------|-----------------------|
| rule    | Rule within a policy. |

## description

A description of the containing `<rule>` or `<policy>`. It does not affect the execution of the `<rule>` or `<policy>`.

## Example

See `<policy>`.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element             | Description           |
|---------------------|-----------------------|
| <code>policy</code> | A policy.             |
| <code>rule</code>   | Rule within a policy. |

# do-add-association

Sends an <add-association> command to eDirectory™. The dest-dn for the command comes from the value <arg-dn> if it is specified, or from the current object if not specified. The association value sent is provided by <arg-association>.

## Example

```
<do-add-association>
  <arg-dn>
    <token-src-dn/>
  </arg-dn>
  <arg-association>
    <token-src-name/>
  </arg-association>
</do-add-association>
```

## Allowed Content

| Element         | Description           |
|-----------------|-----------------------|
| arg-dn          | DN argument.          |
| arg-association | Association argument. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| direct    | true   false<br><br>Use destCommandProcessor to carry out this action.<br><br>Deprecated. Use when="direct" instead. | false         |
| disabled  | true   false<br><br>True if this element is disabled.  | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

( arg-dn ? , arg-association )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-add-dest-attr-value

Adds the value specified by `<arg-value>` to the named attribute on an object in the destination data store. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified, or by the current object if not specified.

## Example

```
<do-add-dest-attr-value name="Member">
  <arg-dn>
    <token-text>Users/ManagerGroup</token-text>
  </arg-dn>
  <arg-value>
    <token-dest-dn/>
  </arg-value>
</do-add-dest-attr-value>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-value</code>       | Value argument.       |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of object to modify.<br><br>Can be required (for schema mapping purposes) if the object is other than the current object.<br>Supports variable expansion. | #IMPLIED      |
| direct     | true   false<br><br>Use destCommandProcessor to carry out this action.<br><br>Deprecated. Use when="direct" instead.  | false         |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the attribute. Supports variable expansion.  | #REQUIRED     |
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

(( arg-dn | arg-association ) ? , arg-value )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Association argument.                   |

# do-add-dest-object

Creates an object of type class-name that in the destination data store with a name and location provided by <arg-dn>. Any attribute values added as part of the object creation must be done in subsequent <do-add-dest-attr-value> actions using the same <arg-dn>.

## Example

```
<do-add-dest-object class-name="User">
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
</do-add-dest-object>
<do-add-dest-attr-value name="Surname">
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
  <arg-value>
    <token-text>Flintstone</token-text>
  </arg-value>
</do-add-dest-attr-value>
```

## Allowed Content

| Element | Description  |
|---------|--------------|
| arg-dn  | DN argument. |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| class-name | CDATA<br><br>Class name of the object to create. Supports variable expansion.  | #REQUIRED     |
| direct     | true   false<br><br>Use destCommandProcessor to carry out this action.<br><br>Deprecated. Use when="direct" instead. | false         |
| disabled   | true   false<br><br>True if this element is disabled.  | false         |

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| when      | <p>auto   before   after   direct</p> <p>When this action should be performed:</p> <p>auto - Automatically determined (either in or after the current operation).</p> <p>before - before the current operation.</p> <p>after - After the current operation.</p> <p>direct - Written directly to the destination data store instead of being added to the current document.</p> | auto          |

## Content Rule

( arg-dn )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |



# do-add-role

Initiates a request to the Roles Based Provisioning Module (RBPM) to assign the Role specified by role-id to an Identity.

## Remarks

The target Identity is specified by either `<arg-dn>` or `<arg-association>` if specified or by the current object otherwise. If specified by `<arg-dn>`, the DN must in LDAP format. The request is made to the RBPM enabled User Application server specified by url using credentials specified by id and `<arg-password>`. Additional optional arguments to the Role assignment request may be specified by the following named `<arg-string>`s.

| Name              | Description  |
|-------------------|--|
| description       | A description of the reason for the request used for auditing and (if necessary) approval purposes.<br><br>Default: Request generated by policy.   |
| effective-time    | The time (in CTIME format) the role assignment should become effective.<br><br>Default: now  |
| expiration-time   | The time (in CTIME format) the role assignment automatically expires.<br><br>Default: never  |
| sod-justification | A justification for requesting an exception for any Separation of Duty violations this assignment will trigger.<br><br>Default: No exception will be requested and the request will fail if it causes a violation. |

If any type of error occurs while requesting the role assignment, the error string is available to the enclosing policy in the local variable named `error.do-add-role`. Otherwise that local variable is not available.

## Example

```
<do-add-role id="cn=RoleAdmin,o=People"
  url="http://localhost:8080/IDMProv"
  role-id="cn=Contractor,cn=Level30,cn=RoleDefs,cn=RoleConfig,
  cn=AppConfig,cn=UserApplication,cn=DriverSet,o=novell">
  <arg-password>
    <token-named-password name="role-admin"/>
  </arg-password>
  <arg-string name="description">
    <token-text>Requested by policy because isContractor attribute set
    to true</token-text>
  </arg-string>
  <arg-string name="effective-time">
    <token-src-attr name="Hire Date"/>
  </arg-string>
  <arg-string name="expiration-time">
    <token-convert-time dest-format="!CTIME"
```

```

        dest-tz="UTC" offset="6"
        offset-unit="month" src-format="!CTIME" src-tz="UTC">
        <token-src-attr name="Hire Date"/>
    </token-convert-time>
</arg-string>
</do-add-role>

```

## Allowed Content

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-password</b>    | Password argument.    |
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-association</b> | Association argument. |
| <b>arg-string</b>      | String argument.      |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| id        | CDATA<br><br>The LDAP format DN of a user authorized to make the request. Supports variable expansion.                        | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                                 | false         |
| role-id   | CDATA<br><br>The LDAP format DN of the Role to assign. Supports variable expansion.   | #REQUIRED     |
| url       | CDATA<br><br>The URL of the User Application server hosting the Roles Based Provisioning Module. Supports variable expansion. | #REQUIRED     |

## Content Rule

( arg-password, ( arg-dn | arg-association ) ? , arg-string \* )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Association argument.                                       |

# do-add-src-attr-value

Adds the value specified by `<arg-value>` to the named attribute on an object in the source data store. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified, or by the current object if not specified.

## Example

```
<do-add-src-attr-value name="Member">
  <arg-dn>
    <token-text>Users/ManagerGroup</token-text>
  </arg-dn>
  <arg-value>
    <token-dest-dn/>
  </arg-value>
</do-add-src-attr-value>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-value</code>       | Value argument.       |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of the object to modify.<br><br>an be required (for schema mapping purposes) if object is other than the current object. Supports variable expansion. | #IMPLIED      |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |
| name       | CDATA<br><br>Name of the attribute. Supports variable expansion.  | #REQUIRED     |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

(( arg-dn | arg-association ) ? , arg-value )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Association argument.                   |

# do-add-src-object

Creates an object of type class-name in the source data store with a name and location provided by `<arg-dn>`. Any attribute values to be added as part of the object creation must be done in subsequent `<do-add-src-attr-value>` actions using the same `<arg-dn>`.

## Example

```
<do-add-src-object class-name="User">
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
</do-add-src-object>
<do-add-src-attr-value name="Surname">
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
  <arg-value>
    <token-text>Flintstone</token-text>
  </arg-value>
</do-add-src-attr-value>
```

## Allowed Content

| Element             | Description  |
|---------------------|--------------|
| <code>arg-dn</code> | DN argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br>Class name of object to create   | #REQUIRED     |
| disabled   | true   false<br>True if this element is disabled.                                     | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of policy. | false         |

## Content Rule

( arg-dn )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-append-xml-element

Appends a custom element named by the name attribute to the set of elements selected by an expression.

## Example

```
<do-append-xml-element name="jdbc:statement" expression=".."/>
<do-append-xml-element name="jdbc:sql"
  expression="../jdbc:statement[last()]" />
<do-append-xml-text expression="../jdbc:statement[last()]/jdbc:sql">
  <arg-string>
    <token-text> UPDATE dirxml.emp SET fname = '</token-text>
    <token-op-attr name="Given Name"/>
    <token-text>' </token-text>
  </arg-string>
</do-append-xml-text>
```

## Allowed Content

EMPTY

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| before     | CDATA<br><br>XPath 1.0 expression evaluated relative to each of the nodes select by expression that returns a node-set containing the child nodes which the new elements should be inserted before. | #IMPLIED      |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |
| expression | CDATA<br><br>XPath 1.0 expression that returns a node-set containing the elements to which the new elements should be appended.   | #REQUIRED     |
| name       | NMTOKEN<br><br>Tag name of the element<br><br>Can contain a namespace prefix if that prefix has been defined on the <code>&lt;policy&gt;</code> .   | #REQUIRED     |



| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-append-xml-text

Appends the text provided by `<arg-string>` to the set of elements selected by expression.

## Example

See `<do-append-xml-element>`.

## Allowed Content

| Element                 | Description      |
|-------------------------|------------------|
| <code>arg-string</code> | String argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| before     | CDATA<br><br>XPath 1.0 expression evaluated relative to each of the nodes select by expression that returns a node-set containing the child nodes which the text should be inserted before. | #REQUIRED     |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |
| expression | CDATA<br><br>XPath 1.0 expression that returns a node-set containing the elements to which the new elements should be appended.   | #REQUIRED     |
| notrace    | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

( arg-string )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-break

Stops the current operation from being processed by any more actions or rules within the current policy.

## Example

```
<do-break/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-clear-dest-attr-value

Removes all the values for the named attribute from an object in the destination data store. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified, or by the current object if not specified.

## Example

```
<do-clear-dest-attr-value name="Member">
  <arg-dn>
    <token-text>Users/ManagerGroup</token-text>
  </arg-dn>
</do-clear-dest-attr-value>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of object to modify.<br><br>Can be required (for schema mapping purposes) if object is other than the current object.<br>Supports variable expansion. | #IMPLIED      |
| direct     | true   false<br><br>Use destCommandProcessor to carry out this action.<br><br>Deprecated. Use when="direct" instead.  | false         |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |
| name       | CDATA<br><br>Name of the attribute. Supports variable expansion.  | #REQUIRED     |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

( arg-dn | arg-association ) ?

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-clear-op-property

Clears any operation property with the given name from the current operation.

## Example

```
<do-clear-op-property name="myProperty"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| name      | NMTOKEN<br>Name of the operation property.  | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-clear-src-attr-value

Removes all values for the named attribute from an object in the source data store. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified, or by the current object if not specified.

## Example

```
<do-clear-src-attr-value name="Member">
  <arg-dn>
    <token-text>Users/ManagerGroup</token-text>
  </arg-dn>
</do-clear-src-attr-value>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of the object to modify.<br><br>Can be required (for schema mapping purposes) if object is other than the current object. | #IMPLIED      |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |
| name       | CDATA<br><br>Name of the attribute.   | #REQUIRED     |
| notrace    | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

( arg-dn | arg-association ) ?



## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-clear-sso-credential

Clears a credential from the object specified by the `<arg-dn>` element in the Single Sign On credential store specified by the `<store-def-dn>` element for the application specified by the `<app-id>` element. Additional information about the credential to be cleared can be specified by additional named `<arg-string>` elements. The number of the strings and the names used are dependent on the credential store and application for which the credential is targeted.

## Example

```
<do-clear-sso-credential store-def-dn="../../Library/SSO1" app-id="AD7">
  <arg-dn>
    <token-parse-dn src-dn-format="src-dn" dest-dn-format="ldap" start="0" length="-1">
      <token-src-dn/>
    </token-parse-dn>
  </arg-dn>
</do-clear-sso-credential>
```

## Allowed Content

| Element                 | Description      |
|-------------------------|------------------|
| <code>arg-dn</code>     | DN argument.     |
| <code>arg-string</code> | String argument. |

## Attributes

| Attribute               | Possible Values  | Default Value |
|-------------------------|--|---------------|
| <code>app-def-dn</code> | CDATA<br><br>DN of the application credential definition object.<br><br>Only used by the UI so the various UIs should agree on the DN format used. | #IMPLIED      |
| <code>app-id</code>     | CDATA<br><br>Application ID for the credential. Supports variable expansion.   | #REQUIRED     |
| <code>notrace</code>    | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |

| Attribute    | Possible Values  | Default Value |
|--------------|--|---------------|
| notrace      | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |
| store-def-dn | CDATA<br><br>Slash form DN of the credential store definition object.<br><br>Can be relative to the including policy. Supports variable expansion. | #REQUIRED     |

## Content Rule

( arg-dn , arg-string \* )

## Parent Elements

| Element     | Description                                     |
|-------------|---|
| actions     | Actions that are performed by a <rule> element. |
| arg-actions | Actions argument.                               |

## do-clone-op-attr

Duplicates all elements that are children of the current operation with the attr-name attribute equal to the name specified by src-name within the operation with attr-name set to dest-name.

### Example

```
<do-clone-op-attr src-name="Member" dest-name="Equivalent to Me"/>
```

### Allowed Content

EMPTY

### Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| dest-name | CDATA<br>The attribute name to give to the clone.  | #REQUIRED     |
| disabled  | true   false<br>True if this element is disabled.  | false         |
| notrace t | rue   false<br>True if this element should not be traced during execution of the policy. | false         |
| src-name  | CDATA<br>The attribute name to clone.  | #REQUIRED     |

### Content Rule

Empty

### Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-clone-xpath

Appends deep copies of the nodes selected by <src-expression> to the set of elements selected by <dest-expression>.

## Example

```
<do-append-xml-element name="delete" expression=".." />
<do-clone-xpath src-expression="@*" dest-expression="../modify[last()]" />
```

## Allowed Content

EMPTY

## Attributes

| Attribute         | Possible Values  | Default Value |
|-------------------|--|---------------|
| before            | CDATA<br><br>XPath 1.0 expression evaluated relative to each of the nodes select by dest-expression that returns a node-set containing the child nodes which the non-attribute cloned nodes should be inserted before. | #REQUIRED     |
| dest-expression . | CDATA<br><br>XPath 1.0 expression that returns a node-set containing the elements to which the cloned nodes should be appended   | #REQUIRED     |
| disabled          | true   false<br><br>True if this element is disabled.  | false         |
| notrace           | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |
| src-expression    | CDATA<br><br>XPath 1.0 expression that returns a node-set containing the nodes that are cloned   | #REQUIRED     |

## Content Declaration

Empty

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-delete-dest-object

Deletes an object in the destination data store. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified or by the current object otherwise.

## Example

```
<do-delete-dest-object>
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
</do-delete-dest-object>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| class-name | CDATA<br>Class name of target object.<br>Support variable expansion.   | #IMPLIED      |
| direct     | true   false<br>Use destCommandProcessor to carry out this action.<br>Deprecated. Use when="direct" instead. | false         |
| disabled   | true   false<br>True if this element is disabled.  | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy.                    | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

(( arg-dn | arg-association ) ? )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |



# do-delete-src-object

The <do-delete-src-object> action deletes the object in the source data store. The target object is specified by either <arg-dn> or <arg-association> if specified, or by the current object if not specified.

## Example

```
<do-delete-src-object>
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
</do-delete-src-object>
```

## Allowed Content

| Element         | Description           |
|-----------------|-----------------------|
| arg-dn          | DN argument.          |
| arg-association | Association argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br>Class name of target object.<br>Support variable expansion.                      | #IMPLIED      |
| disabled   | true   false<br>True if this element is disabled.   | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

(( arg-dn | arg-association ) ? )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-find-matching-object

Performs a query in the destination data store and in the dest-dn or the dest-dn <association> to be added to the current operation. It is only valid when the current operation is <add>.

## Remarks

<arg-dn> is required when scope="entry" and optional otherwise.

At least one <arg-match-attr> is required when scope="subtree" or scope="subordinates". Because it is undefined what <query> does with <search-attr> when scope="entry", it is also undefined what <do-find-matching-object> does.

The <query> generates a scope attribute based on the scope attribute of the <do-find-matching-object>. It is a dest-dn attribute set to the content of <arg-dn>, if any. It is a class-name attribute and <search-class> based on the class-name attribute from the current object. For each <arg-match-attr> there is a <search-attr> for the same attribute, populated with either the <arg-value> content of <arg-match-attr> (if it exists) or the values available in the current operation. If no value is available, then no query is performed and the action does not find a match.

Any <instance> elements returned from the <query> are considered matches.

If the destination data store is the application, then an association is added to the current operation for each <instance> that is returned. No query is performed if the current operation already has a non-empty association, thus allowing multiple <do-find-matching-object> actions to be strung together in the same rule. If more than one <instance> is returned, then the local variable *error.do-find-matching-object* will be set to a node-set containing the list of src-dn's from the instances if they are available, or the list of associations if the src-dn's are not available.

If the destination data store is eDirectory, then the dest-dn attribute for the current operation is set. No query is performed if the current operation already has a non-empty dest-dn attribute, thus allowing multiple <do-find-matching-object> actions to be strung together in the same rule. If only a single <instance> is returned and that <instance> is not already associated, then the dest-dn of the current operation is set to the src-dn of the <instance> and the local variable *error.do-find-matching-object* is set to the src-dn from that <instance>. If only a single <instance> is returned and that <instance> is already associated, then the dest-dn of the current operation is set to the single character &#xFFFC; and the local variable *error.do-find-matching-object* is set to the src-dn from that <instance>. If multiple <instance> elements are returned then the dest-dn of the current operation is set to the single character &#xFFFD; and the local variable *error.do-find-matching-object* is set to a node-set containing the src-dn's from those <instance>'s..

## Example

```
<do-find-matching-object scope="subordinates">
  <arg-dn>
    <token-text>Users/</token-text>
    <token-attr name="OU"/>
  </arg-dn>
  <arg-match-attr name="CN"/>
</do-find-matching-object>
```

```

    <arg-match-attr name="L"/>
    <arg-value>
      <token-text>Provo</token-text>
    </arg-value>
  </do-find-matching-object>

```

## Allowed Content

| Element               | Description               |
|-----------------------|---------------------------|
| <b>arg-dn</b>         | DN argument.              |
| <b>arg-match-attr</b> | Match attribute argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |
| scope     | entry   subordinates   subtree<br>The scope to be searched.                               | subtree       |

## Content Rule

(( arg-dn ? , arg-match-attr + ) | ( arg-dn , arg-match-attr \* ) )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-for-each

Repeats the actions specified by `<arg-actions>` once for each node in `<arg-node-set>` with the local variable `current-node` set to a node-set containing only that node. If the `current-node` is `<entitlement-impl>`, then the actions are also marked as if they were also enclosed in `<do-implement-entitlement>`.

## Example

```
<do-for-each>
  <arg-node-set>
    <token-added-entitlement name="Group">
  </arg-node-set>
  <arg-actions>
    <do-add-dest-attr-value name="Member" class-name="Group">
      <arg-dn>
        <token-local-variable name="current-node"/>
      </arg-dn>
      <arg-value type="dn">
        <token-dest-dn/>
      </arg-value>
    </do-add-dest-attr-value>
  </arg-actions>
</do-for-each>
```

## Allowed Content

| Element                   | Description        |
|---------------------------|--------------------|
| <code>arg-node-set</code> | Node set argument. |
| <code>arg-actions</code>  | Actions argument.  |

## Attributes

| Attribute             | Possible Values   | Default Value |
|-----------------------|---|---------------|
| <code>disabled</code> | true   false<br><br>True if this element is disabled.   | false         |
| <code>notrace</code>  | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( `arg-node-set` , `arg-actions` )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-generate-event

Sends an Identity Manager user-defined event to the Novell® Auditing service. Identity Manager user defined event IDs must be between the range of 1000 to 1999. Valid event levels are defined in the table below. The remaining event data fields are provided by four `<arg-string>` elements with name attributes. The Novell Audit event structure contains two strings (text1, text2) along with one integer (value) and generic field (data). The two text fields are limited to 256 bytes and the data field can contain up to 3 KB of information.

## Remarks

| Level         | Description   |
|---------------|---|
| log-emergency | Events that cause the Metadirectory engine or Identity Manager driver to shut down.                                     |
| log-alert     | Events that require immediate attention.  |
| log-critical  | Events that can cause parts of the Metadirectory engine or Identity Manager driver to malfunction.                      |
| log-error     | Events describing errors that can be handled by the Metadirectory engine or Identity Manager driver.                    |
| log-warning   | Negative events not representing a problem.   |
| log-notice    | Events (positive or negative) an administrator can use to understand or improve use and operation.                      |
| log-info      | Positive events of any importance.  |
| log-debug     | Events of relevance for support or engineers to debug operation of the Metadirectory engine or Identity Manager driver. |

| Tag   | Description  |
|-------|--|
| text1 | Text entered here is stored in the text1 event field.        |
| text2 | Text entered here is stored in the text2 event field.        |
| value | Any number entered here is stored in the value1 event field. |
| data  | Data entered here is stored in the blob event field.         |

## Example

```
<do-generate-event id="1000" level="log-info">
  <arg-string name="text1">
    <token-text>User defined data for text1 field</token-text>
  </arg-string>
  <arg-string name="text2">
```

```

    <token-text>User defined data for text2 field</token-text>
  </arg-string>
  <arg-string name="value">
    <token-text>-602</token-text>
  </arg-string>
  <arg-string name="data">
    <token-text>User defined blob data</token-text>
  </arg-string>
</do-generate-event >

```

## Allowed Content

| Element           | Description      |
|-------------------|------------------|
| <b>arg-string</b> | String argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| id        | CDATA<br><br>Identity Manager user-defined event ID (1000-2000). Supports variable expansion.   | #REQUIRED     |
| level     | log-emergency   log-alert   log-critical   log-error   log-warning   log-notice   log-info   log-debug<br><br>Novell Audit log level. | log-info      |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

( arg-string \* )

## Parent Elements

| Element        | Description   |
|----------------|---|
| <b>actions</b> | Actions that are performed by a <b>&lt;rule&gt;</b> . |



| Element                  | Description       |
|--------------------------|-------------------|
| <code>arg-actions</code> | Actions argument. |

## do-if

Causes the actions specified by the first `<arg-actions>` to be performed if the conditions specified by `<arg-conditions>` evaluate to true or the actions specified by the second `<arg-actions>` (if it exists) to be performed if the conditions specified by `<arg-conditions>` evaluate to false.

### Example

```
<do-if>
  <arg-conditions>
    <and>
      <if-op-attr name="Given Name" op="equal" mode="nocase">fred</if-op-attr>
    </and>
  </arg-conditions>
  <arg-actions>
    <do-set-dest-attr-value name="Surname">
      <arg-value type="string">
        <token-text>Flintstone</token-text>
      </arg-value>
    </do-add-dest-attr-value>
  </arg-actions>
  <arg-actions>
    <do-set-dest-attr-value name="Surname">
      <arg-value type="string">
        <token-text>Rubble</token-text>
      </arg-value>
    </do-add-dest-attr-value>
  </arg-actions>
</do-if>
```

### Allowed Content

| Element                     | Description          |
|-----------------------------|----------------------|
| <code>arg-conditions</code> | Conditions argument. |
| <code>arg-actions</code>    | Actions argument.    |

### Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-conditions , arg-actions , arg-actions ? )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-implement-entitlement

Marks the actions specified by `<arg-actions>` with the `<entitlement-impl>` elements specified in `<arg-node-set>` so that the Metadirectory engine knows to report the results of those actions to the DirXML-EntitlementResult attribute of the current object.

## Example

```
<do-implement-entitlement>
  <arg-node-set>
    <token-removed-entitlement name="Account"/>
  </arg-node-set>
  <arg-actions>
    <do-set-dest-attr-value name="Login Disabled">
      <arg-value type="state">
        <token-text >true</token-text>
      </arg-value>
    </do-set-dest-attr-value>
  </arg-actions>
</do-implement-entitlement>
```

## Allowed Content

| Element                   | Description        |
|---------------------------|--------------------|
| <code>arg-node-set</code> | Node set argument. |
| <code>arg-actions</code>  | Actions argument.  |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-node-set , arg-actions )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-move-dest-object

Moves an object in the destination data store. If two arguments are provided, the object identified by the first argument is moved to the container identified by the second argument. If only a single argument is provided, the current object is moved to the container identified by the single argument.

## Example

```
<do-move-dest-object>
  <arg-dn>
    <token-text>Users/Active/FredFlintstone</token-text>
  </arg-dn>
  <arg-dn>
    <token-text>Users/Inactive</token-text>
  </arg-dn>
</do-move-dest-object>
```

## Allowed Content

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-association</b> | Association argument. |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| class-name | CDATA<br>Class name of target object.<br>Supports variable expansion.  | #IMPLIED      |
| direct     | true   false<br>Use destCommandProcessor to carry out this action.<br>Deprecated. Use when="direct" instead. | false         |
| disabled   | true   false<br>True if this element is disabled.  | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy.                    | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

(( arg-dn | arg-association ) ? , ( arg-dn | arg-association ) )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-move-src-object

Moves an object in the source data store. If two arguments are provided then the object identified by the first argument is moved to the container identified by the second argument. If only a single argument is provided, then the current object is moved to the container identified by the single argument.

## Example

```
<do-move-src-object>
  <arg-dn>
    <token-text>Users/Active/FredFlintstone</token-text>
  </arg-dn>
  <arg-dn>
    <token-text>Users/Inactive</token-text>
  </arg-dn>
</do-move-src-object>
```

## Allowed Content

| Element                         | Description           |
|---------------------------------|-----------------------|
| <a href="#">arg-dn</a>          | DN argument.          |
| <a href="#">arg-association</a> | Association argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br>Class name of target object.<br>Supports variable expansion.                     | #IMPLIED      |
| disabled   | true   false<br>True if this element is disabled.   | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

(( [arg-dn](#) | [arg-association](#) ) ? , ( [arg-dn](#) | [arg-association](#) ) )



## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-reformat-op-attr

Replaces all values for the named attribute within the current operation with the **<arg-value>**. The value of **<arg-value>** is evaluated once for each value being replaced with the local variable current-value set to the original value.

## Example

```
<do-reformat-op-attr name="CN">
  <arg-value>
    <token-upper-case>
      <token-local-variable name="current-value"/>
    </token-upper-case>
  </arg-value>
</do-reformat-op-attr>
<do-reformat-op-attr name="EMail Address">
  <arg-value>
    <token-xpath expression="$current-value/component[@name='eMailAddr']"/>
  </arg-value>
</do-reformat-op-attr>
```

## Allowed Content

| Element          | Description     |
|------------------|-----------------|
| <b>arg-value</b> | Value argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| name      | CDATA<br>Name of the attribute.   | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-value )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-remove-association

Sends a `<remove-association>` command to eDirectory. The association value sent is provided by `<arg-association>`.

## Example

```
<do-remove-association>
  <arg-association>
    <token-src-name/>
  </arg-association>
</do-remove-association>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-association</code> | Association argument. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| direct    | true   false<br><br>Use destCommandProcessor to carry out this action.<br><br>Deprecated. Use when="direct" instead. | false         |
| disabled  | true   false<br><br>True if this element is disabled.  | false         |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                        | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

( arg-association )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-remove-dest-attr-value

Removes the value specified by **<arg-value>** from the named attribute on an object in the destination data store. The target object is specified by either **<arg-dn>** or **<arg-association>** if specified or by the current object otherwise.

## Example

```
<do-remove-dest-attr-value name="Member">
  <arg-dn>
    <token-text>Users/ManagerGroup</token-text>
  </arg-dn>
  <arg-value>
    <token-dest-dn/>
  </arg-value>
</do-remove-dest-attr-value>
```

## Allowed Content

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-association</b> | Association argument. |
| <b>arg-value</b>       | Value argument.       |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of the object to modify.<br><br>Can be required (for schema mapping purposes) if the object is other than the current object. | #IMPLIED      |
| direct     | true   false<br><br>Use destCommandProcessor to carry out this action.<br><br>Deprecated. Use when="direct" instead.                                  | false         |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br>Name of the attribute.   | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy.   | false         |
| when      | auto   before   after   direct<br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

(( arg-dn | arg-association ) ? , arg-value )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-remove-role

Initiates a request to the Roles Based Provisioning Module (RBPM) to revoke the Role specified by role-id from an Identity.

## Remarks

The target Identity is specified by either `<arg-dn>` or `<arg-association>` if specified or by the current object otherwise. If specified by `<arg-dn>`, the DN must in LDAP format. The request is made to the RBPM enabled User Application server specified by url using credentials specified by id and `<arg-password>`. Additional optional arguments to the Role assignment request may be specified by the following named `<arg-string>`s.

| Name           | Description  |
|----------------|--|
| description    | A description of the reason for the request used for auditing and (if necessary) approval purposes.<br><br>Default: Request generated by policy. |
| effective-time | The time (in CTIME format) the role assignment should become effective.<br><br>Default: now  |

If any type of error occurs while requesting the role assignment, the error string is available to the enclosing policy in the local variable named `error.do-remove-role`. Otherwise that local variable is not available.

## Example

```
<do-remove-role id="cn=RoleAdmin,o=People" url="http://localhost:8080/IDMProv"
  role-id="cn=Contractor,cn=Level30,cn=RoleDefs,cn=RoleConfig,
  cn=AppConfig,cn=UserApplication,cn=DriverSet,o=novell">
  <arg-password>
    <token-named-password name="role-admin"/>
  </arg-password>
  <arg-string name="description">
    <token-text>Requested by policy because isContractor attribute set
    to false</token-text>
  </arg-string>
</do-remove-role>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-password</code>    | Password argument.    |
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-string</code>      | String argument.      |



## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| id        | CDATA<br><br>The LDAP format DN of a user authorized to make the request. Supports variable expansion.                        | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                                 | false         |
| role-id   | CDATA<br><br>The LDAP format DN of the Role to assign. Supports variable expansion.   | #REQUIRED     |
| url       | CDATA<br><br>The URL of the User Application server hosting the Roles Based Provisioning Module. Supports variable expansion. | #REQUIRED     |

## Content Rule

( arg-password, (arg-dn | arg-association ) ? , arg-string \* )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Association argument.                   |

# do-remove-src-attr-value

Removes the value specified by `<arg-value>` from the named attribute on an object in the source data store. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified, or by the current object if not specified.

## Example

```
<do-remove-src-attr-value name="Member">
  <arg-dn>
    <token-text>Users/ManagerGroup</token-text>
  </arg-dn>
  <arg-value>
    <token-src-dn/>
  </arg-value>
</do-remove-src-attr-value>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-value</code>       | Value argument.       |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of the object to modify.<br><br>Can be required (for schema mapping purposes) if the object is other than the current object. | #IMPLIED      |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |
| name       | CDATA<br><br>Name of the attribute.   | #REQUIRED     |
| notrace    | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

(( arg-dn | arg-association ) ? , arg-value )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-rename-dest-object

Renames an object in the destination data store to the name specified by `<arg-string>`. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified or by the current object otherwise.

## Example

```
<do-rename-dest-object>
  <arg-dn>
    <token-text>Users/Active/Fred Flintstone</token-text>
  </arg-dn>
  <arg-string>
    <token-text>Fat Freddy</token-text>
  </arg-string>
</do-rename-dest-object>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-string</code>      | String argument.      |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| class-name | CDATA<br>Class name of target object.<br>Supports variable expansion.  | #IMPLIED      |
| direct     | true   false<br>Use destCommandProcessor to carry out this action.<br>Deprecated. Use when="direct" instead. | false         |
| disabled   | true   false<br>True if this element is disabled.  | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy.                    | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

(( arg-dn | arg-association ) ? , arg-string )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-rename-op-attr

Causes all elements that are children of the current operation with the attr-name attribute equal to the name specified by src-name to have attr-name set to dest-name.

## Example

```
<do-rename-op-attr src-name="Surname" dest-name="sn"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| dest-name | CDATA<br>The new attribute name.  | #REQUIRED     |
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |
| src-name  | CDATA<br>The original attribute name.   | #REQUIRED     |

## Content Rule

Empty

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-rename-src-object

Renames an object in the source data store to the name specified by `<arg-string>`. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified, or by the current object if not specified.

## Example

```
<do-rename-src-object>
  <arg-dn>
    <token-text>Users/Active/Fred Flintstone</token-text>
  </arg-dn>
  <arg-string>
    <token-text>Fat Freddy</token-text>
  </arg-string>
</do-rename-src-object>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-value</code>       | Value argument.       |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br>Class name of target object.<br>Support variable expansion.                      | #IMPLIED      |
| disabled   | true   false<br>True if this element is disabled.   | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

(( arg-dn | arg-association ) ? , arg-string )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |



# do-send-email

Sends an e-mail notification to the specified server. Optional credentials for authentication to the SMTP server are provided in the ID and password attributes. The type attribute identifies if the e-mail message contains plain text or HTML data. The various e-mail addresses, subject, and message are provided within **<arg-string>** elements and corresponding tag name attributes.

## Remarks

| Tag Name           | Description  |
|--------------------|--|
| to                 | Adds the address to the list of e-mail recipients. Multiple instances are allowed.     |
| cc                 | Adds the address to the list of CC e-mail recipients. Multiple instances are allowed.  |
| bcc                | Adds the address to the list of BCC e-mail recipients. Multiple instances are allowed. |
| from               | Specifies the address to be used as the originating e-mail address.                    |
| reply-to           | Specifies the address to be used as the e-mail message reply address.                  |
| subject            | Specifies the e-mail subject.  |
| message            | Specifies the content of the e-mail message.   |
| encoding           | Specifies the character encoding to use for the e-mail message.                        |
| custom-smtp-header | Specifies a custom SMTP header to add to the email message.                            |

## Example

```
<do-send-email server="smtp.company.com" id="user" password="emailpwd"
type="text">
  <arg-string name="to">
    <token-text>to_user1@company.com</token-text>
  </arg-string>
  <arg-string name="to">
    <token-text>to_user2@company.com</token-text>
  </arg-string>
  <arg-string name="cc">
    <token-text>cc_user@company.com</token-text>
  </arg-string>
  <arg-string name="bcc">
    <token-text>bcc_user@company.com</token-text>
  </arg-string>
  <arg-string name="from">
    <token-text>from_user@company.com</token-text>
  </arg-string>
  <arg-string name="subject">
```

```

    <token-text>This is the email subject</token-text>
  </arg-string>
  <arg-string name="message">
    <token-text>This is the email body</token-text>
  </arg-string>
</do-send-email>

```

## Allowed Content

| Element             | Description        |
|---------------------|--------------------|
| <b>arg-string</b>   | String argument.   |
| <b>arg-password</b> | Password argument. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| disabled  | true   false<br>True if this element is disabled.  | false         |
| id        | CDATA<br>User account on the SMTP server. Support variable expansion.  | #IMPLIED      |
| password  | CDATA<br>Password for the user on the SMTP server. Deprecated; use <b>&lt;arg-password&gt;</b> with <b>&lt;token-named-password&gt;</b> instead. | #IMPLIED      |
| server    | CDATA<br>DNS name or IP address of the SMTP server. Support variable expansion.  | #REQUIRED     |
| type      | text   html<br>Identifies if e-mail message contains plain text or HTML data.  | text          |

## Content Rule

( arg-string \* )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-send-email-from-template

Generates an e-mail notification using an SMTP notification configuration object, e-mail template object, and replacement tokens. The target SMTP server along with credentials for authentication and the originating address are read from the SMTP notification configuration object. The subject and e-mail message are created using the template object and template replacement tokens. Replacement tokens are declared within a **<arg-string>** element and tag name attribute. The value of **<arg-string>** tag attribute is interpreted as html, if it is enclosed within **<use-html></use-html>** tags. Reserved replacement tokens specify the various recipient addresses.

## Remarks

| Reserved Token | Description  |
|----------------|--|
| to             | Adds the address to the list of e-mail recipients. Multiple instances are allowed.     |
| cc             | Adds the address to the list of CC e-mail recipients. Multiple instances are allowed.  |
| bcc            | Adds the address to the list of BCC e-mail recipients. Multiple instances are allowed. |
| reply-to       | Specifies the address to be used as the e-mail message reply address.                  |
| encoding       | Specifies the character encoding to use for the e-mail message.                        |

## Example

```
<do-send-email-from-template
  notification-dn="/cn=security/cn=DefaultNotification Collection"
  template-dn="/cn=security/cn=DefaultNotification Collection/cn=PS
  Sync Fail">
  <arg-password>
    <token-named-password name="email-server"/>
  </arg-password>
  <arg-string name="manager">
    <token-text>Bill Jones</token-text>
  </arg-string>
  <arg-string name="surname">
    <token-text>Smith</token-text>
  </arg-string>
  <arg-string name="given-name">
    <token-text>Joe</token-text>
  </arg-string>
  <arg-string name="to">
    <token-text>to_user@company.com</token-text>
  </arg-string>
  <arg-string name="cc">
    <token-text>cc_user@company.com</token-text>
  </arg-string>
  <arg-string name="custom-smtp-header">
```

```

    <token-text>X-Priority: 1(Highest)</token-text>
  </arg-string>
  <arg-string name="FailureReason">
    <token-text>
      <use-html><p>sample reason 1</p><p>sample reason 2</p></use-html>
    </token-text>
  </arg-string>
</do-send-email-from-template>

```

## Allowed Content

| Element             | Description        |
|---------------------|--------------------|
| <b>arg-password</b> | Password argument. |
| <b>arg-string</b>   | String argument.   |

## Attributes

| Attribute       | Possible Values  | Default Value |
|-----------------|--|---------------|
| disabled        | true   false<br>True if this element is disabled.  | false         |
| notification-dn | CDATA<br>Slash form DN of the SMTP notification configuration object.  | #REQUIRED     |
| disabled        | true   false<br>True if this element is disabled.  | false         |
| password        | CDATA<br>Password for user on the SMTP server. Deprecated; use <b>arg-password</b> with <b>token-named-password</b> instead. | #IMPLIED      |
| template-dn     | CDATA<br>Slash form DN of the e-mail template object. Supports variable expansion.   | #REQUIRED     |

## Content Rule

( arg-string \* )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-set-default-attr-value

Adds the values specified by <arg-value> to the current operation for named attribute if no values for that attribute already exist. It is only valid when the current operation is <add>. If write-back=true default values are also written back to the source object.

## Example

```
<do-set-default-attr-value name="L">
  <arg-value>
    <token-text>Unknown</token-text>
  </arg-value>
</do-set-default-attr-value>
```

## Allowed Content

| Element   | Description     |
|-----------|-----------------|
| arg-value | Value argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| disabled   | true   false<br>True if this element is disabled.   | false         |
| name       | CDATA<br>Name of the attribute. Supports variable expansion.                                | #REQUIRED     |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy.   | false         |
| write-back | true   false<br>True if the default value should also be written back to the source object. | false         |

## Content Rule

( arg-value + )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |



# do-set-dest-attr-value

Adds the value specified by **<arg-value>** to the named attribute on an object in the destination data store, and removes all other values for that attribute. The target object is specified by either **<arg-dn>** or **<arg-association>** if specified, or by the current object if not specified.

## Example

```
<do-set-dest-attr-value name="OU">
  <arg-value>
    <token-text>Sales</token-text>
  </arg-value>
</do-set-dest-attr-value>
```

## Allowed Content

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-association</b> | Association argument. |
| <b>arg-value</b>       | Value argument.       |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br>Class name of object to modify.<br>Can be required (for schema mapping purposes) if the object is other than the current object. | #IMPLIED      |
| direct     | true   false<br>Use destCommandProcessor to carry out this action.<br>Deprecated. Use when="direct" instead.                              | false         |
| disabled   | true   false<br>True if this element is disabled  | false         |
| name       | CDATA<br>Name of the attribute.   | #REQUIRED     |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

(( arg-dn | arg-association ) ? , arg-value )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-set-dest-password

Sets the value specified by `<arg-string>`'s as the old password (optional) and new password for the current object in the destination data store. The target object is specified by `<arg-dn>` or `<arg-association>` if specified or by the current object otherwise.

## Example

```
<do-set-dest-password>
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
  <arg-string>
    <token-text>oldpassword</token-text>
  </arg-string>
  <arg-string>
    <token-text>newpassword</token-text>
  </arg-string>
</do-set-dest-password>
```

---

**IMPORTANT:** When specifying both the old password and the new password, the old password must be specified in the first arg-string.

---

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-string</code>      | String argument.      |

## Attributes

| Attribute  | Possible Values  | Default Value |
|------------|--|---------------|
| class-name | CDATA<br>Class name of target object.<br>Supports variable expansion.  | #IMPLIED      |
| direct     | true   false<br>Use destCommandProcessor to carry out this action.<br>Deprecated. Use when="direct" instead. | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| when      | auto   before   after   direct<br><br>When this action should be performed:<br><br>auto - Automatically determined (either in or after the current operation).<br><br>before - Before the current operation.<br><br>after - After the current operation.<br><br>direct - Written directly to the destination data store instead of being added to the current document. | auto          |

## Content Rule

(( arg-dn | arg-association ) ? , arg-string, arg-string ? )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-set-local-variable

Sets a local variable with the given name to the string value specified by `<arg-string>`, the XPath 1.0 node set specified by `<arg-node-set>`, or the Java\* object specified by `<arg-object>`.

## Example

```
<!-- Sets variable to the string value of the first value of Surname -->
<do-set-local-variable name="lastName">
  <arg-string>
    <token-attr name="Surname"/>
  </arg-string>
</do-set-local-variable>

<!-- sets variable equal to all the value elements of Surname -->
<do-set-local-variable name="lastName">
  <arg-node-set>
    <token-attr name="Surname"/>
  </arg-node-set>
</do-set-local-variable>

<!-- sets variable equal to an instance of java.util.Random -->
<!-- note that the prefix jrandom needs to have been mapped to -->
<!-- the URI http://www.novell.com/nxsl/java/java.util.Random -->
<!-- on the <policy> -->
<do-set-local-variable name="lastName">
  <arg-object>
    <token-xpath expression="jrandom:new()" />
  </arg-object>
</do-set-local-variable>
```

## Allowed Content

| Element                   | Description           |
|---------------------------|-----------------------|
| <code>arg-string</code>   | String argument.      |
| <code>arg-node-set</code> | Node set argument.    |
| <code>arg-object</code>   | Java object argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.             | false         |
| name      | NMTOKEN<br>Name of the variable. Supports variable expansion. | #REQUIRED     |

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |
| scope     | policy   driver<br><br>Scope of the variable.<br><br>Policy: Variable is visible only within the current policy during the current invocation of the policy.<br><br>Driver: Variable is visible to all policies within the current driver until the driver is stopped.<br><br>Supports variable expansion. | policy        |

## Content Rule

( arg-string | arg-node-set | arg-object )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-set-op-association

Sets the association value for the current operation to the value provided by **<arg-association>**.

## Example

```
<do-set-op-association>  
  <arg-association>  
    <token-src-name/>  
  </arg-association>  
</do-set-op-association>
```

## Allowed Content

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-association</b> | Association argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-association )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-set-op-class-name

Causes the object class name for the current operation to be set to the value provided by **<arg-string>**.

## Example

```
<do-set-op-class-name>
  <arg-string>
    <token-text>User</token-text>
    <token-src-name/>
  </arg-string>
</do-set-op-class-name>
```

## Allowed Content

| Element           | Description      |
|-------------------|------------------|
| <b>arg-string</b> | String argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-string )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |



# do-set-op-dest-dn

Sets the destination DN for the current operation to the value provided by **<arg-dn>**.

## Example

```
<do-set-op-dest-dn>
  <arg-dn>
    <token-text>Novell\Users\</token-text>
  </arg-dn>
</do-set-op-dest-dn>
```

## Allowed Content

| Element       | Description  |
|---------------|--------------|
| <b>arg-dn</b> | DN argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-dn )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-set-op-property

Sets an operation property with the given name to the value specified by `<arg-string>` on the current operation. An operation property is a named value that is stored as an attribute on an `<operation-data>` element within an operation and is typically used to supply additional context that might be needed by the policy that handles the results of an operation.

## Example

```
<do-set-op-property name="myProperty">
  <arg-string>
    <token-text>Fred</token-text>
  </arg-string>
</do-set-op-property>
```

## Allowed Content

| Element                 | Description      |
|-------------------------|------------------|
| <code>arg-string</code> | String argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| name      | NMTOKEN<br>Name of the operation property.  | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-string )

## Parent Elements

| Element              | Description   |
|----------------------|---|
| <code>actions</code> | Actions that are performed by a <code>&lt;rule&gt;</code> . |

| Element                  | Description       |
|--------------------------|-------------------|
| <code>arg-actions</code> | Actions argument. |

# do-set-op-src-dn

Sets the source DN for the current operation to the value provided by `<arg-dn>`.

## Example

```
<do-set-op-src-dn>
  <arg-dn>
    <token-text>Novell\Users\</token-text>
    <token-attr name="CN"/>
  </arg-dn>
</do-set-op-src-dn>
```

## Allowed Content

| Element             | Description  |
|---------------------|--------------|
| <code>arg-dn</code> | DN argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( `arg-dn` )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-set-op-template-dn

Sets the template DN for the current operation to the value provided by <arg-dn>. It is only valid when the current operation is <add>.

## Example

```
<do-set-op-template-dn>
  <arg-dn>
    <token-text>Novell\Users\UserTemplate</token-text>
  </arg-dn>
</do-set-op-template-dn>
```

## Allowed Content

| Element | Description  |
|---------|--------------|
| arg-dn  | DN argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-dn )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-set-src-attr-value

Adds the value specified by `<arg-value>` to the named attribute on an object in the source data store and all other values for that attribute are removed. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified or by the current object otherwise.

## Example

```
<do-set-src-attr-value name="OU">
  <arg-value>
    <token-text>Sales</token-text>
  </arg-value>
</do-set-src-attr-value>
```

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-value</code>       | Value argument.       |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br>Class name of object to modify.<br>Can be required (for schema mapping purposes) if object is other than the current object. | #IMPLIED      |
| disabled   | true   false<br>True if this element is disabled.   | false         |
| name       | CDATA<br>Name of the attribute.   | #REQUIRED     |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

(( arg-dn | arg-association ) ? , arg-value )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-set-src-password

Sets the value specified by `<arg-string>`s as the old password (optional) and new password for the current object in the destination data store. The target object is specified by either `<arg-dn>` or `<arg-association>` if specified or by the current object otherwise.

## Example

```
<do-set-src-password>
  <arg-dn>
    <token-text>Users/Fred Flintstone</token-text>
  </arg-dn>
  <arg-string>
    <token-text>oldpassword</token-text>
  </arg-string>
  <arg-string>
    <token-text>newpassword</token-text>
  </arg-string>
</do-set-src-password>
```

---

**IMPORTANT:** When specifying both the old password and the new password, the old password must be specified in the first arg-string.

---

## Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |
| <code>arg-string</code>      | String argument.      |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br>Class name of target object.<br>Supports variable expansion.                     | #IMPLIED      |
| disabled   | true   false<br>True if this element is disabled.   | false         |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy. | false         |



## Content Rule

(( arg-dn | arg-association ) ? , arg-string, arg-string ? )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-set-sso-credential

Sets a credential on the object specified by the `<arg-dn>` element in the Single Sign On credential store specified by the `<store-def-dn>` element for the application specified by the `<app-id>` element. The credential information is specified by additional named `<arg-string>` elements. The number of the strings and the names used are dependent on the credential store and application for which the credential is targeted.

## Example

```
<do-set-sso-credential store-def-dn="../../Library/SSO1" app-id="AD7">
  <arg-dn>
    <token-parse-dn src-dn-format="src-dn" dest-dn-format="ldap" start="0"
      length="-1">
      <token-src-dn/>
    </token-parse-dn>
  </arg-dn>
  <arg-string name="username">
    <token-src-name/>
  </arg-string>
  <arg-string name="password">
    <token-local-variable name="generatedPassword"/>
  </arg-string>
</do-set-sso-credential>
```

## Allowed Content

| Element                 | Description      |
|-------------------------|------------------|
| <code>arg-dn</code>     | DN argument.     |
| <code>arg-string</code> | String argument. |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| app-def-dn | CDATA<br><br>DN of the application credential definition object<br><br>Only used by the UI so the various UIs should agree on the DN format used. | #IMPLIED      |
| app-id     | CDATA<br><br>Application ID for the credential.   | #REQUIRED     |
| disabled   | true   false<br><br>True if this element is disabled.   | false         |

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| notrace      | true   false<br><br>True if this element should not be traced during execution of the policy.                         | false         |
| store-def-dn | CDATA<br><br>Slash form DN of the credential store definition object.<br><br>Can be relative to the including policy. | #REQUIRED     |

## Content Rule

( arg-dn , arg-string \* )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-set-sso-passphrase

Sets the passphrase question and answer specified by **<arg-string>** elements on the object specified by the **<arg-dn>** element in the Single Sign On credential store specified by the **<store-def-dn>** element.

## Example

```
<do-set-sso-passphrase store-def-dn="../../Library/SSO1">
  <arg-dn>
    <token-parse-dn src-dn-format="src-dn" dest-dn-format="ldap" start="0"
      length="-1">
      <token-src-dn/>
    </token-parse-dn>
  </arg-dn>
  <arg-string>
    <token-text/>What favorite color?<token-text/>
  </arg-string>
  <arg-string>
    <token-text/>blue<token-text/>
  </arg-string>
</do-set-sso-passphrase>
```

## Allowed Content

| Element           | Description      |
|-------------------|------------------|
| <b>arg-dn</b>     | DN argument.     |
| <b>arg-string</b> | String argument. |

## Attributes

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| disabled     | true   false<br><br>True if this element is disabled.   | false         |
| notrace      | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |
| store-def-dn | CDATA<br><br>{description of store-def-dn}  | #REQUIRED     |

## Content Rule

( arg-dn , arg-string , arg-string )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-set-xml-attr

Sets a custom XML attribute named by the name attribute on the set of elements selected by expression.

## Example

```
<do-set-xml-attr name="cert-id" expression=".">
  <arg-string>
    <token-text>c:\lotus\domino\data\eng.id</token-text>
  </arg-string>
</do-set-xml-attr>
<do-set-xml-attr name="cert-pwd" expression=".">
  <arg-string>
    <token-text>certify2eng</token-text>
  </arg-string>
</do-set-xml-attr>
```

## Allowed Content

| Element    | Description      |
|------------|------------------|
| arg-string | String argument. |

## Attributes

| Attribute    | Possible Values  | Default Value |
|--------------|--|---------------|
| disabled     | true   false<br><br>True if this element is disabled.  | false         |
| expression   | CDATA<br><br>XPath 1.0 expression that returns a node-set containing the elements on which the XML attribute should be set.                          | #REQUIRED     |
| name NMTOKEN | Tag name of the XML attribute.<br><br>Might contain a namespace prefix if that prefix has been defined on the <policy>. Supports variable expansion. | #REQUIRED     |
| notrace      | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |

## Content Rule

( arg-string )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

## do-start-workflow

Starts the workflow specified by workflow-id for the recipient specified by `<arg-dn>` on the User Application server specified by the URL using credentials specified by ID and `<arg-password>`. The recipient must be an LDAP format DN of an object in the directory served by the User Application server.

### Remark

The additional arguments to the workflow may be specified by named `<arg-string>` elements. The number of the strings and the names used are dependent on the workflow to be started. There are some names that have special meaning and are available regardless of the workflow being started.

- ♦ **:InitiatorOverrideDN:** The LDAP format DN of the initiator of the workflow, if other than the User used to authenticate.
- ♦ **:CorrelationID:** An identifier used to correlate related workflows.

If any type of error occurs while starting the workflow, the error string is available to the enclosing policy in the local variable named `error.do-start-workflow`. Otherwise that local variable is unavailable.

### Example

```
<do-start-workflow
workflow-
id="CN=ApproveCellPhone,CN=RequestDefs,CN=AppConfig,CN=UserApplication,CN=DriverSe
t,O=novell" url="http://localhost:8080/IDMProv" id="cn=WorkflowAdmin,o=People">
  <arg-password>
    <token-named-password name="workflow-admin"/>
  </arg-password>
  <arg-dn>
    <token-parse-dn src-dn-format="qualified-slash" dest-dn-format="ldap">
      <token-xpath expression="@qualified-src-dn"/>
    </token-parse-dn>
  </arg-dn>
  <arg-string name="provider">
    <token-text>ACMEWireless</token-text>
  </arg-string>
  <arg-string name="reason">
    <token-text>new hire</token-text>
  </arg-string>
</do-start-workflow>
```

### Allowed Content

| Element                   | Description        |
|---------------------------|--------------------|
| <code>arg-password</code> | Password argument. |
| <code>arg-dn</code>       | DN argument.       |
| <code>arg-string</code>   | String argument.   |



## Attributes

| Attribute   | Possible Values   | Default Value |
|-------------|---|---------------|
| disabled    | true   false<br><br>True if this element is disabled.   | false         |
| id          | CDATA<br><br>The LDAP format DN of a user authorized to start workflows on the User Application server.<br><br>Supports variable expansion. | #REQUIRED     |
| notrace     | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| url         | CDATA<br><br>The URL of the User Application server where the workflow runs.<br><br>Supports variable expansion.                            | #REQUIRED     |
| workflow-id | CDATA<br><br>The LDAP format DN of the workflow to start.<br><br>Supports variable expansion.   | #REQUIRED     |

## Content Rule

( arg-password , arg-dn , arg-string \* )

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-status

Generates a status notification with the specified level and with a message provided by `<arg-string>`.

## Remarks

If the level is retry, then the policy immediately halts processing of the input document and schedule a retry of the event currently being processed.

If the level is fatal, then the policy immediately halts processing of the input document and initiates a shutdown of the driver.

If a the current operation is an event-id, then that event-id is used for the status notification; otherwise, there is no event-id reported.

## Example

```
<do-status level="warning">
  <arg-string>
    <token-src-dn/>
    <token-text>: operation vetoed on out-of-scope object</token-text>
  </arg-string>
</do-status >
```

## Allowed Content

| Element                 | Description      |
|-------------------------|------------------|
| <code>arg-string</code> | String argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| level     | CDATA<br><br>Status level.  | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-string )

## Parent Elements

| Element                  | Description   |
|--------------------------|---|
| <code>actions</code>     | Actions that are performed by a <code>&lt;rule&gt;</code> . |
| <code>arg-actions</code> | Actions argument.   |

# do-strip-op-attr

Strips all elements that are children of the current operation with the attr-name attribute equal to the name specified by name from the current operation.

## Example

```
<do-strip-op-attr name="Member"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| name      | CDATA<br>Name of the attribute.   | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

Empty

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-strip-xpath

Removes nodes selected by the XPath 1.0 expression from the current operation. The expression must evaluate to a node set.

## Example

```
<do-strip-xpath expression="*[@attr-name='OU']"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| disabled   | true   false<br><br>True if this element is disabled.   | false         |
| expression | CDATA<br><br>XPath expression.  | #REQUIRED     |
| notrace    | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-trace-message

Causes the trace message provided by `<arg-string>` to DSTRACE if the specified level is less than or equal to the currently configured trace level.

## Example

```
<do-trace-level level="0" color="blue">
  <arg-string>
    <token-text>placing new object at </token-text>
    <token-dest-dn/>
  </arg-string>
</do-status >
```

## Allowed Content

| Element                 | Description      |
|-------------------------|------------------|
| <code>arg-string</code> | String argument. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| color     | black   blue   green   cyan   red   purple   brown   grey   drgrey   brblue   brgreen   brcyan   brred   brpurple   yellow   white<br>Color of the text to send. | brpurple      |
| disabled  | true   false<br>True if this element is disabled.  | false         |
| level     | CDATA<br>Minimum trace level at which to send the message.   | 0             |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy.  | false         |

## Content Rule

( arg-string )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

# do-veto

Cancels the current operation.

## Example

```
<do-veto/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

Empty

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |



# do-veto-if-op-attr-not-available

Cancels the current operation if the named attribute is not available in the current operation.

## Example

```
<do-veto-if-op-attr-not-available name="CN"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| name      | CDATA<br>Name of the attribute. Supports variable expansion.                              | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

Empty

## Parent Elements

| Element            | Description   |
|--------------------|---|
| <b>actions</b>     | Actions that are performed by a <b>&lt;rule&gt;</b> . |
| <b>arg-actions</b> | Actions argument.                                     |

# do-while

Causes the actions specified by **<arg-actions>** to be repeated while the conditions specified by **<arg-conditions>** evaluate to true.

## Example

```
<do-set-local-variable name="counter">
  <arg-string>
    <token-text>1</token-text>
  </arg-string>
</do-set-local-variable>
<do-while>
  <arg-conditions>
    <and>
      <if-local-variable name="counter" op="not-gt" mode="numeric">10</if-local-
variable>
    </and>
  </arg-conditions>
  <arg-actions>
    <do-trace-message level="0" color="yellow">
      <arg-string>
        <token-text>Counter = </token-text>
        <token-local-variable name="counter"/>
      </arg-string>
    </do-trace-message>
    <do-set-local-variable name="counter">
      <arg-string>
        <token-xpath expression="$counter + 1"/>
      </arg-string>
    </do-set-local-variable>
  </arg-actions>
</do-while>
```

## Allowed Content

| Element               | Description          |
|-----------------------|----------------------|
| <b>arg-conditions</b> | Conditions argument. |
| <b>arg-actions</b>    | Actions argument.    |

## Attributes

| Attribute | Possible Values                                   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled. | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-conditions , arg-actions )

## Parent Elements

| Element     | Description                             |
|-------------|---|
| actions     | Actions that are performed by a <rule>. |
| arg-actions | Actions argument.                       |

## if-association

Performs a test on the association value of the current operation or the current object. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

### Remarks

| Operator       | Returns true when...  |
|----------------|---|
| associated     | There is an established association for the current object.   |
| available      | There is a non-empty association value specified by the current operation.  |
| equal          | The association value specified by the current operation is exactly equal to the content of <if-association>. Supports variable expansion.  |
| lt             | The association value specified by the current operation is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt             | The association value specified by the current operation is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-associated | Associated returns false.   |
| not-available  | Available returns false.  |
| not-equal      | Equal returns false.  |
| not-lt         | Less than returns false.  |
| not-gt         | Greater than returns false.   |

### Example

```
<if-association op="associated" />
<if-association op="available" />
<if-association
op="equal">{07414faa-1b38-40ec-8b7c-c20aa21ddafb}</if-association>
```

### Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| mode      | case   nocase   regex   src-dn  <br>dest-dn   numeric   octet<br><br>Comparison mode if op implies a<br>comparison. | nocase        |
| notrace   | true   false<br><br>True if this element should not be<br>traced during execution of the<br>policy.                 | false         |
| op        | available   equal   lt   gt   not-<br>available   not-equal not-lt   not-gt<br><br>Test operator.                   | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-attr

Performs a test on attribute values of the current object in either the current operation or the source data store.

## Remarks

It can logically be thought of as equivalent to:

```
<or>
  <if-op-attr/>
  <if-src-attr/>
</or>
```

| Operator      | Returns true when...   |
|---------------|--|
| available     | There is a value available in either the current operation or the source data store for the specified attribute.   |
| equal         | There is a value available in either the current operation or the source data store for the specified attribute that equals the content of <if-attr> when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements otherwise, it must be text. Supports variable expansion. |
| lt            | There is a value available in either the current operation or the source data store for the specified attribute that is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.   |
| gt            | There is a value available in either the current operation or the source data store for the specified attribute that is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion.  |
| not-available | Available returns false.   |
| not-equal     | Equal returns false.   |
| not-lt        | Less than returns false.   |
| not-gt        | Greater than returns false.  |

## Example

```
<if-attr op="available" name="OU"/>
<if-attr op="equal" mode="nocase" name="OU">Sales</if-attr>
<if-attr op="equal" mode="structured" name="Language">
  <component name="string">EN</component>
  <component name="string">JP</component>
</if-attr >
```

## Allowed Content

#PCDATA

| Element          | Description      |
|------------------|------------------|
| <b>component</b> | Value component. |

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| disabled  | true   false<br>True if this element is disabled.  | false         |
| mode      | case   nocase   regex   src-dn   dest-dn   numeric   octet   structured<br>Comparison mode if op implies a comparison. | nocase        |
| name      | CDATA<br>Name of the attribute.  | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy.                              | false         |
| op        | available   equal   lt   gt   not-available   not-equal   not-lt   not-gt<br>Test operator.                            | #REQUIRED     |

## Content Rule

( #PCDATA | component ) \*

## Parent Elements

| Element    | Description          |
|------------|----------------------|
| <b>and</b> | Logical conjunction. |
| <b>or</b>  | Logical disjunction. |

# if-class-name

Performs a test on the object class name in the current operation.

## Remarks

| Operator      | Returns true when...   |
|---------------|--|
| available     | There is an object class name available in the current operation.  |
| equal         | There is an object class name available in the current operation and it equals the content of <b>&lt;if-class-name&gt;</b> when compared using the specified comparison mode.                        |
| lt            | There is an object class name available in the current operation and it is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt            | There is an object class name available in the current operation and it is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-available | Available returns false.   |
| not-equal     | Equal returns false.   |
| not-lt        | Less than returns false.   |
| not-gt        | Greater than returns false.  |

## Example

```
<if-class-name op="available"/>  
<if-class-name op="equal" mode="nocase">User</if-class-name >
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values                                   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled. | false         |



| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| mode      | case   nocase   regex   src-dn   dest-dn   numeric   octet<br><br>Comparison mode if op implies a comparison. | nocase        |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                 | false         |
| op        | available   equal   lt   gt   not-available   not-equal not-lt   not-gt<br><br>Test operator.                 | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

## if-dest-attr

Performs a test on attribute values of the current object in the destination data store. The type of test performed depends on the operator specified by the op attribute. The table below shows the type of test performed by each operator.

### Remarks

| Operator       | Returns true when...   |
|----------------|--|
| available      | There is a value available in the destination data store for the specified attribute.  |
| equal          | There is a value available for the specified attribute in the destination data store that equals the content of <if-dest-attr> when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements otherwise, it must be text. Supports variable expansion.         |
| lt             | There is a value available for the specified attribute in the destination data store that is less than the content of the condition when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements, otherwise it must be text. Supports variable expansion.    |
| gt             | There is a value available for the specified attribute in the destination data store that is greater than the content of the condition when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements, otherwise it must be text. Supports variable expansion. |
| not-associated | Associated returns false.  |
| not-available  | Available returns false.   |
| not-equal      | Equal returns false.   |
| not-lt         | Less than returns false.   |
| not-gt         | Greater than returns false.  |

### Example

```
<if-dest-attr op="available" name="OU"/>
<if-dest-attr op="equal" mode="nocase" name="OU">Sales</if-dest-attr>
<if-dest-attr op="equal" mode="structured" name="Language">
  <component name="string">EN</component>
  <component name="string">JP</component>
</if-dest-attr >
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| mode      | case   nocase   regex   src-dn  <br>dest-dn   numeric   octet  <br>structured<br><br>Comparison mode if op="equal"<br>or op="not-equal" | nocase        |
| name      | CDATA<br><br>Name of the attribute. Supports<br>variable expansion.   | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be<br>traced during execution of the<br>policy.                                     | false         |
| op        | available   equal   lt   gt   not-<br>available   not-equal   not-lt   not-<br>gt<br><br>Test operator.                                 | #REQUIRED     |

## Content Rule

( #PCDATA | component ) \*

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-dest-dn

Performs a test on the destination DN in the current operation.

## Remarks

| Operator      | Returns true when...   |
|---------------|--|
| available     | There is a destination DN available.   |
| equal         | There is a destination DN available and it equals the content of <if-dest-dn> when compared using semantics appropriate to the DN format of the destination data store. Supports variable expansion.   |
| in-container  | There is a destination DN available and it represents an object in the container specified by the content of <if-dest-dn> when compared using semantics appropriate to the DN format of the destination data store. Supports variable expansion. |
| in-subtree    | There is a destination DN available and it represents an object in the subtree specified by the content of <if-dest-dn> when compared using semantics appropriate to the DN format of the destination data store. Supports variable expansion.   |
| not-available | Available returns false.   |
| not-equal     | Equal returns false.   |
| not-lt        | Less than returns false.   |
| not-gt        | Greater than returns false.  |

## Example

```
<if-dest-dn op="available"/>
<if-dest-dn op="equal">Novell\Users\Fred</if-dest-dn>
<if-dest-dn op="in-container">Novell\Users</if-dest-dn>
<if-dest-dn op="in-subtree">Novell</if-dest-dn >
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| Attribute | disabled true   false<br>True if this element is disabled.  | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy.                                       | false         |
| op        | available   equal   in-container   in-subtree   not-available   not-equal   not-in-container   not-in-subtree<br>Test operator. | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-entitlement

Performs a test on entitlements of the current object in either the current operation or the Identity Vault data store.

## Remarks

| Operator          | Returns true when...  |
|-------------------|---|
| available         | The named entitlement is available and granted in either the current operation or the Identity Vault data store.  |
| changing          | The current operation contains a change (grant or revoke) of the named entitlement.   |
| changing-from     | The current operation contains a change that revokes a value of the named entitlement that has a value that equals the content of <if-entitlement> when compared using the specified comparison mode. Supports variable expansion.                                |
| changing-to       | The current operation contains a change that grants a value of the named entitlement that has a value that equals the content of <if-entitlement> when compared using the specified comparison mode. Supports variable expansion.                                 |
| equal             | The named entitlement is available and granted in either the current operation or the Identity Vault data store and has a value that equals the content of <if-entitlement> when compared using the specified comparison mode. Supports variable expansion.       |
| lt                | The named entitlement is available and granted in either the current operation or the Identity Vault data store and has a value that is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt                | The named entitlement is available and granted in either the current operation or the Identity Vault data store and has a value that is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-available     | Available returns false.  |
| not-changing      | Changing returns false  |
| not-changing-from | Changing-from returns false.  |
| not-changing-to   | Changing-to returns false.  |
| not-equal         | Equal returns false.  |

| Operator | Returns true when...        |
|----------|-----------------------------|
| not-lt   | Less than returns false.    |
| not-gt   | Greater than returns false. |

## Example

```
<if-entitlement op="available" name="notes-group"/>
<if-entitlement op="changing" name="notes-group"/>
<if-entitlement op="changing-from" name="notes-group"/>Sales</if-entitlement>
<if-entitlement op="changing-to" name="notes-group"/>Sales</if-entitlement>
<if-entitlement op="equal" mode="nocase" name="notes-group">Sales</if-entitlement>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| mode      | case   nocase   regex   src-dn   dest-dn   numeric   octet<br><br>Comparison mode if op="equal" or op="not-equal" or op="changing-from" or op="changing-to".                                  | nocase        |
| name      | CDATA<br><br>Name of the entitlement. Supports variable expansion.  | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| op        | available   changing   changing-from   changing-to   equal   lt   gt   not-available   not-changing   not-changing-from   not-changing-to   not-equal   not-lt   not-gt<br><br>Test operator. | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |



# if-global-variable

Performs a test on a global configuration variable. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

## Remarks

| Operator      | Returns true when...  |
|---------------|---|
| available     | There is a global configuration variable with the specified name.   |
| equal         | There is a global configuration variable with the specified name and its value equals the content of <if-global-variable> when compared using the specified comparison mode. Supports variable expansion.   |
| lt            | There is a global configuration variable with the specified name and its value is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt            | There is a global configuration variable with the specified name and its value is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-available | Available returns false.  |
| not-equal     | Equal returns false.  |
| not-lt        | Less than returns false.  |
| not-gt        | Greater than returns false.   |

## Example

```
<if-global-variable op="available" name="myGlobalVariable"/>
<if-global-variable op="equal" mode="nocase" name="myGlobalVariable">enabled</if-
global-variable>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| mode      | case   nocase   regex   src-dn   dest-dn   numeric   octet<br><br>comparison mode if op implies a comparison. | nocase        |
| name      | CDATA<br><br>Name of the variable. Supports variable expansion.   | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                 | false         |
| op        | available   equal   lt   gt   not-available   not-equal   not-lt   not-gt<br><br>Test operator.               | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-local-variable

Performs a test on a local variable. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator. If local variable holds a node set, the string value of each node in the node set is used for comparison purposes. If the same local variable exists in both the policy scope and the driver scope, the variable in the policy scope takes precedence.

## Remarks

| Operator      | Returns true when...   |
|---------------|--|
| available     | There is a local variable with the specified name that has been defined by an action of an earlier <b>&lt;rule&gt;</b> within the <b>&lt;policy&gt;</b> .  |
| equal         | There is a local variable with the specified name and its value equals the content of <b>&lt;if-local-variable&gt;</b> when compared using the specified comparison mode. Supports variable expansion. |
| lt            | There is a local variable with the specified name and its value is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.              |
| gt            | There is a local variable with the specified name and its value is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion.           |
| not-available | Available returns false.   |
| not-equal     | Equal returns false.   |
| not-lt        | Less than returns false.   |
| not-gt        | Greater than returns false.  |

## Example

```
<if-local-variable op="available" name="myLocalVariable"/>
<if-local-variable op="equal" mode="nocase" name="myLocalVariable">enabled</if-
local-variable>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| disabled  | true   false<br><br>True if this element is disabled.  | false         |
| mode      | case   nocase   regex   src-dn   dest-dn   numeric   octet<br><br>Comparison mode if op="equal" or op="not-equal". | nocase        |
| name      | CDATA<br><br>Name of the variable. Supports variable expansion.  | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                      | false         |
| op        | available   equal   lt   gt   not-available   not-equal   not-lt   not-gt<br><br>Test operator.                    | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-named-password

Performs a test on a named password from the driver. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

## Remarks

| Operator      | Returns true when...                                 |
|---------------|--|
| available     | There is password with the specified name available. |
| not-available | Available returns false.                             |

## Example

```
<if-named-password op="available" name="extraPassword"/>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| name      | CDATA<br>Name of the password.  | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |
| op        | available   not-available<br>Test operator.   | #REQUIRED     |

## Content Declaration

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-op-attr

Performs a test on attribute values in the current operation.

## Remarks

| Operator      | Returns true when...  |
|---------------|---|
| available     | There is a value available in the current operation (<add-attr>, <add-value> or <attr>) for the specified attribute.  |
| changing      | The current operation contains a change (<modify-attr> or <add-attr>) of the specified attribute.   |
| changing-from | The current operation contains a change that removes a value (<remove-value>) of the specified attribute that equals the content of <if-op-attr> when compared using the specified comparison mode. If mode="structured", then the content must be a set of <component> elements; otherwise, it must be text.   |
| changing-to   | The current operation contains a change that adds a value (<add-value> or <add-attr>) to the specified attribute that equals the content of <if-op-attr> when compared using the specified comparison mode. If mode="structured", then the content must be text; otherwise, it must be a set of <component> elements.                                   |
| equal         | There is a value available in the current operation (other than a <remove-value>) for the specified attribute that equals the content of <if-op-attr> when compared using the specified comparison mode. If mode="structured", then the content must be a set of <component> elements; otherwise, it must be text. Supports variable expansion.         |
| lt            | There is a value available in the current operation (other than a <remove-value>) for the specified attribute that is less than the content of the condition when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements, otherwise it must be text. Supports variable expansion.    |
| gt            | There is a value available in the current operation (other than a <remove-value>) for the specified attribute that is greater than the content of the condition when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements, otherwise it must be text. Supports variable expansion. |

| Operator          | Returns true when...         |
|-------------------|------------------------------|
| not-available     | Available returns false.     |
| not-changing      | Changing returns false       |
| not-changing-from | Changing-from returns false. |
| not-changing-to   | Changing-to returns false.   |
| not-equal         | Equal returns false.         |
| not-lt            | Less than returns false.     |
| not-gt            | Greater than returns false.  |

## Example

```

<if-op-attr op="available" name="OU"/>
<if-op-attr op="changing" name="OU"/>
<if-op-attr op="changing-from" name="OU"/>Sales</if-op-attr>
<if-op-attr op="changing-to" name="OU"/>Sales</if-op-attr>
<if-op-attr op="equal" mode="nocase" name="OU">Sales</if-op-attr>
<if-op-attr op="equal" mode="structured" name="Language">
  <component name="string">EN</component>
  <component name="string">JP</component>
</if-op-attr>

```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| disabled  | true   false<br><br>True if this element is disabled.  | false         |
| mode      | case   nocase   regex   src-dn  <br>dest-dn   numeric   octet  <br>structured<br><br>Comparison mode if op="equal"<br>or op="not-equal" or<br>op="changing-from" or<br>op="changing-to". | nocase        |
| name      | CDATA<br><br>Name of the attribute. Supports<br>variable expansion.  | #REQUIRED     |



| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| op        | available   changing   changing-from   changing-to   equal   lt   gt   not-available   not-changing   not-changing-from   not-changing-to   not-equal   not-lt   not-gt<br><br>Test operator. | #REQUIRED     |

## Content Rule

( #PCDATA | component ) \*

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-op-property

Performs a test on an operation property on the current operation. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

## Remarks

| Operator      | Returns true when...   |
|---------------|--|
| available     | There is an operation property with the specified name on the current operation.   |
| equal         | There is a an operation property with the specified name on the current operation and its value equals the content of <if-op-property> when compared using the specified comparison mode. Supports variable expansion.       |
| lt            | There is a an operation property with the specified name on the current operation and its value is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt            | There is a an operation property with the specified name on the current operation and its value is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-available | Available returns false.   |
| not-equal     | Equal returns false.   |
| not-lt        | Less than returns false.   |
| not-gt        | Greater than returns false.  |

## Example

```
<if-op-property op="available" name="myLocalVariable"/>
<if-op-property op="equal" mode="nocase" name="myProperty">true</if-local-
variable>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| disabled  | true   false<br><br>True if this element is disabled.  | false         |
| mode      | case   nocase   regex   src-dn   dest-dn   numeric   octet<br><br>Comparison mode if op="equal" or op="not-equal". | nocase        |
| name      | CDATA<br><br>Name of the operation property.<br>Supports variable expansion.                                       | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                      | false         |
| op        | available   equal   lt   gt   not-available   not-equal   not-lt   not-gt<br><br>Test operator.                    | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-operation

Performs a test on the name of the current operation. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

## Remarks

| Operator  | Returns true when...   |
|-----------|--|
| equal     | The name of the current operation is exactly equal to content of <if-operation>. Supports variable expansion.  |
| lt        | The name of the current operation is less than content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt        | The name of the current operation is greater than content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-equal | Equal returns false.   |
| not-lt    | Less than returns false.   |
| not-gt    | Greater than returns false.  |

## Example

```
<if-operation op="equal">add</if-operation>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| mode      | case  nocase   regex   scr-dn  <br>dest-dn   numeric   octet<br>Comparison mode if op implies a comparison. | case          |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |
| op        | equal   lt   gt   not-equal   not-lt   not-gt<br><br>Test operator.                           | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# if-password

Performs a test on a password in the current operation. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

## Remarks

| Operator      | Returns true when...  |
|---------------|---|
| available     | There is password available in the current operation.   |
| equal         | There is password available in the current operation and its value equals the content of the condition when compared using the specified comparison mode. Supports variable expansion.          |
| lt            | There is password available in the current operation and its value is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt            | There is password available in the current operation and its value is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-available | Available returns false.  |
| not-equal     | Equal returns false.  |
| not-lt        | Less than returns false.  |
| not-gt        | Greater than returns false.   |

## Example

```
<if-password op="available"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values                                   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled. | false         |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| mode      | case  nocase   regex   scr-dn  <br>dest-dn   numeric   octet<br><br>Comparison mode if op implies a comparison. | case          |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                   | false         |
| op        | available   equal   lt   gt   not-<br>available   not-equal   not-lt   not-<br>gt<br><br>Test operator.         | #REQUIRED     |

## Content Rule

Empty

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

## if-src-attr

Performs a test on attribute values of the current object in the source data store. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

### Remarks

| Operator      | Returns true when...  |
|---------------|---|
| available     | There is a value available in the source data store for the specified attribute.  |
| equal         | There is a value available in the source data store for the specified attribute that equals the content of <if-src-attr> when compared using the specified comparison mode. If mode="structured", then the content must be a set of <component> elements; otherwise, it must be text. Supports variable expansion.        |
| lt            | There is a value available in the source data store for the specified attribute that is less than the content of the condition when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements, otherwise it must be text. Supports variable expansion.    |
| gt            | There is a value available in the source data store for the specified attribute that is greater than the content of the condition when compared using the specified comparison mode. If mode="structured" then the content must be a set of <component> elements, otherwise it must be text. Supports variable expansion. |
| not-available | Available returns false.  |
| not-equal     | Equal returns false.  |
| not-lt        | Less than returns false.  |
| not-gt        | Greater than returns false.   |

### Example

```
<if-src-attr op="available" name="OU"/>
<if-src-attr op="equal" mode="nocase" name="OU">Sales</if-src-attr>
<if-src-attr op="equal" mode="structured" name="Language">
  <component name="string">EN</component>
  <component name="string">JP</component>
</if-src-attr>
```



## Allowed Content

#PCDATA

| Element          | Description      |
|------------------|------------------|
| <b>component</b> | Value component. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| mode      | case   nocase   regex   src-dn  <br>dest-dn   numeric   octet  <br>structured<br><br>Comparison mode if op implies a<br>comparison. | nocase        |
| name      | CDATA<br><br>Name of the attribute. Supports<br>variable expansion.   | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be<br>traced during execution of the<br>policy.                                 | false         |
| op        | available   equal   lt   gt   not-<br>available   not-equal   not-lt   not-<br>gt<br><br>Test operator.                             | #REQUIRED     |

## Content Rule

( #PCDATA | component ) \*

## Parent Elements

| Element    | Description          |
|------------|----------------------|
| <b>and</b> | Logical conjunction. |
| <b>or</b>  | Logical disjunction. |

# if-src-dn

Performs a test on the source DN in the current operation.

## Remarks

| Operator      | Returns true when...   |
|---------------|--|
| available     | There is a source DN available.  |
| equal         | There is a source DN available and it equals the content of <if-src-dn> when compared using semantics appropriate to the DN format of the source data store. Supports variable expansion.                |
| in-container  | There is a source DN available and it represents an object in the container specified by the content of <if-src-dn> when compared using semantics appropriate to the DN format of the source data store. |
| in-subtree    | There is a source DN available and it represents an object in the subtree specified by the content of <if-src-dn> when compared using semantics appropriate to the DN format of the source data store.   |
| not-available | Available returns false.   |
| not-equal     | Equal returns false.   |
| not-lt        | Less than returns false.   |
| not-gt        | Greater than returns false.  |

## Example

```
<if-src-dn op="available"/>  
<if-src-dn op="equal">Novell\Users\Fred</if-src-dn>  
<if-src-dn op="in-container">Novell\Users</if-src-dn>  
<if-src-dn op="in-subtree">Novell</if-src-dn>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values                                       | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled. | false         |

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                                      | false         |
| op        | available   equal   in-container   in-subtree   not-available   not-equal   not-in-container   not-in-subtree<br><br>est operator. | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

## if-xml-attr

Performs a test on an XML attribute of the current operation. The type of test performed depends on the operator specified by the op attribute. The following table shows the type of test performed by each operator.

### Remarks

| Operator      | Returns true when...  |
|---------------|---|
| available     | There is an XML attribute with the specified name on the current operation.   |
| equal         | There is a an XML attribute with the specified name on the current operation and its value equals the content of the condition when compared using the specified comparison mode. Supports variable expansion.          |
| lt            | There is a an XML attribute with the specified name on the current operation and its value is less than the content of the condition when compared using the specified comparison mode. Supports variable expansion.    |
| gt            | There is a an XML attribute with the specified name on the current operation and its value is greater than the content of the condition when compared using the specified comparison mode. Supports variable expansion. |
| not-available | Available returns false.  |
| not-equal     | Equal returns false.  |
| not-lt        | Less than returns false.  |
| not-gt        | Greater than returns false.   |

### Example

```
<if-xml-attr op="available" name="from-merge"/>
<if-xml-attr op="equal" mode="nocase" name="level">error</if-xml-attr>
```

### Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| mode      | case   nocase   regex   src-dn  <br>dest-dn   numeric   octet<br><br>Comparison mode if op implies a<br>comparison.   | nocase        |
| name      | CDATA<br><br>Tag name of the XML attribute.<br>Supports variable expansion.<br><br>After expansion, must be a legal<br>XML QName. It can contain a<br>namespace prefix if and only if<br>that prefix has been defined on<br>the <code>&lt;policy&gt;</code> . | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be<br>traced during execution of the<br>policy.   | false         |
| op        | available   equal   lt   gt   not-<br>available   not-equal   not-lt   not-<br>gt<br><br>Test operator.   | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element          | Description          |
|------------------|----------------------|
| <code>and</code> | Logical conjunction. |
| <code>or</code>  | Logical disjunction. |

# if-xpath

Performs a test on the results of evaluating an XPath 1.0 expression. The type of test performed depends on the operator specified by the `op` attribute. The following table shows the type of test performed by each operator.

## Remarks

| Operator | Returns true when...                    |
|----------|---|
| true     | The XPath expression evaluates to true. |
| not-true | True returns false.                     |

## Example

```
<if-xpath op="true">add-attr[@attr-name='OU']/value[string(.) =  
"Sales"]</if-xpath>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |
| op        | true   not-true<br>Test operator.   | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description          |
|---------|----------------------|
| and     | Logical conjunction. |
| or      | Logical disjunction. |

# include

Includes the rules from the policy referenced by the name attribute at runtime into the including policy as if they are part of the including policy at the point of inclusion.

## Remarks

The name attribute should be the slash form DN of the object containing the policy to be included. The DN might be relative to the including policy.

The inclusion is recursive because a policy might include other policies. It is an error for a policy to directly or indirectly include itself.

## Example

See `<policy>`.

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values                                   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled. | false         |
| name      | CDATA<br>The name of the policy to include.       | #REQUIRED     |

## Content Declaration

Empty

## Parent Elements

| Element             | Description |
|---------------------|-------------|
| <code>policy</code> | A policy.   |



## or

Specifies a set of tests that are to be performed and whose results are to be logically ORed together. A set of <or> elements enclosed by a <conditions> are ANDed together.

## Example

See <policy>.

## Allowed Content

| Element            | Description   |
|--------------------|---|
| if-association     | Tests an association.   |
| if-attr            | Tests an attribute in the current operation or the current object in the source data store. |
| if-class-name      | Tests the object class of the current operation.  |
| if-dest-attr       | Tests an attribute of the current object in the destination data store.                     |
| if-dest-dn         | Tests the destination DN of the current operation.  |
| if-entitlement     | Tests an entitlement of the current object.   |
| if-global-variable | Tests a global variable.  |
| if-local-variable  | Tests a local variable.   |
| if-named-password  | Tests a named password.   |
| if-op-attr         | Tests an attribute in the current operation.  |
| if-op-property     | Tests an operation property.  |
| if-operation       | Tests the name of the current operation.  |
| if-password        | Tests the password of the current operation.  |
| if-src-attr        | Tests an attribute of current object in the source data store.                              |
| if-src-dn          | Tests the source DN of the current operation.   |
| if-xml-attr        | Tests an XML attribute of the current operation.  |
| if-xpath           | Tests an XPath expression.  |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br><br>True if this element is disabled.   | false         |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( if-association | if-attr | if-class-name | if-dest-attr | if-dest-dn | if-entitlement | if-global-variable | if-local-variable | if-named-password | if-op-attr | if-op-property | if-operation | if-password | if-src-attr | if-src-dn | if-xml-attr | if-xpath ) \*

## Parent Elements

| Element               | Description  |
|-----------------------|--|
| <b>arg-conditions</b> | Conditions argument.   |
| <b>conditions</b>     | Conditions under which the actions of a <b>&lt;rule&gt;</b> are performed. |

# policy

A policy consists of an ordered set of **<rule>**s. A **<rule>** consists of a set of **<conditions>** to be tested and an ordered set of **<actions>** to be performed when the conditions are met.

## Remarks

A **<policy>** operates on an XDS document and its primary purpose is to examine and modify that document. A **<policy>** can also get additional context from outside of the document and cause side effects that are not reflected in the result document.

The following outline describes the basic operation of a **<policy>**:

- ♦ The XDS document is divided into its constituent operations. An operation is any element that is a child of **<input>** or **<output>**. An operation usually represents an event, a command, or a status.
- ♦ The **<policy>** is applied separately to each operation. As the **<policy>** is applied to each operation in turn, that operation becomes the current operation. The object that is described by the current operation **src-dn**, **src-entry-id**, **dest-dn**, **dest-entry-id**, and/or association from the becomes the current object.
- ♦ Each **<rule>** is applied in order to the current operation. All of the **<rule>**s are applied to the current operation unless an action is performed by a prior **<rule>** that causes subsequent **<rule>**s to no longer be applied.
- ♦ The **<conditions>** for the **<rule>** are tested and if the **<conditions>** for the **<rule>** are met then the **<actions>** are applied.

## Variables

DirXML Script supports two kinds of variables: global and local. A global variable is a variable that gets there values from a Global Configuration Value that is defined for the driver or the driver set. Global variables are by definition read-only. A local variable is a variable that is set by a policy. A local variable can exist in one of two different scopes: policy or driver. A policy scoped variable is only visible during the processing of the current operation by the policy that sets the variable. A driver scoped variable is visible from all DirXML Script policies running within the same driver until the driver is stopped. A variable name must be a legal XML Name.

There are a number of global and local variables that are automatically defined:

| Name                   | Type          | Description                                 |
|------------------------|---------------|---|
| dirxml.auto.driverdn   | global/string | Slash format DN of the current driver       |
| dirxml.auto.driverguid | global/string | GUID of the current driver.                 |
| dirxml.auto.treename   | global/string | Tree name of the local eDirectory instance. |

| Name                 | Type                     | Description  |
|----------------------|--------------------------|--|
| fromNDS              | policy local/boolean     | True if the source data store is eDirectory.<br><br>False if the source data store is the connected application.   |
| destQueryProcessor   | policy local/java object | Instance of XdsQueryProcessor used to query the destination data store.  |
| srcQueryProcessor    | policy local/java object | Instance of XdsQueryProcessor used to query the destination data store.  |
| destCommandProcessor | policy local/java object | Instance of XdsCommandProcessor used to query the destination data store.  |
| srcCommandProcessor  | policy local/java object | Instance of XdsCommandProcessor used to query the destination data store.  |
| dnConverter          | policy local/java object | Instance of DNConverter  |
| current-node         | policy local/node-set    | The loop variable for each iteration of <b>&lt;do-for-each&gt;</b> .   |
| current-value        | policy local/node-set    | The loop variable for each iteration of <b>&lt;do-reformat-op-attr&gt;</b> .   |
| current-op           | policy local/node-set    | The current operation.<br><br>Setting this variable using <b>&lt;do-set-local-variable&gt;</b> causes the first operation specified by <b>&lt;arg-node-set&gt;</b> to become the current operation for the remainder of the current policy execution or until it is set to another value. The new current operation must be an element sibling of the original current operation and must have been added by the current policy. |

## Variable Expansion

Many conditions, actions, and tokens support dynamic variable expansion in their attributes or content. Where supported, an embedded reference of the form `$<variable-name>$` is replaced with the value of the local or global variable with the given name. `$<variable-name>$` must be a legal variable name. If the given variable does not exist the reference is replaced with the empty string. Where it is desirable to use a single '\$' and not have it interpreted as a variable reference, it should be escaped with an additional '\$' (e.g. You owe me \$\$100.00). Content and attributes that support variable expansion are annotated with the phrase supports variable expansion.

## Date/Time Parameters

Tokens that deal with dates and times have arguments that deal with the format, language, and time zone of the date and time representation. Date formats arguments may be specified in one of two ways. If the format begins with a '!' character, then the format is a named format. Legal names are defined in the following table:

| Name             | Description  |
|------------------|--|
| !CTIME           | Number of seconds since Midnight, January 1, 1970. (Compatible with eDirectory time syntaxes.) |
| !JTIME           | Number of milliseconds since Midnight, January 1, 1970. (Compatible with Java time.)           |
| !FILETIME        | Number of 100-nanosecond intervals since January 1, 1601. (Compatible with Win32 FILETIME.)    |
| !FULL.TIME       | Language-specific FULL time format.  |
| !LONG.TIME       | Language-specific LONG time format.  |
| !MEDIUM.TIME     | Language-specific MEDIUM time format.  |
| !SHORT.TIME      | Language-specific SHORT time format.   |
| !FULL.DATE       | Language-specific FULL date format.  |
| !LONG.DATE       | Language-specific LONG date format.  |
| !MEDIUM.DATE     | Language-specific MEDIUM date format.  |
| !SHORT.DATE      | Language-specific SHORT date format.   |
| !FULL.DATETIME   | Language-specific FULL date/time format.   |
| !LONG.DATETIME   | Language-specific LONG date/time format.   |
| !MEDIUM.DATETIME | Language-specific MEDIUM date/time format.   |
| !SHORT.DATETIME  | Language-specific SHORT date/time format.  |

If the format does not begin with '!', then the format is interpreted as a custom date/time format conforming to the patterns recognized by `java.text.SimpleDateFormat`.

Language arguments can be specified by an identifier that conforms to IETF RFC 3066. The list of identifiers understood by the system can be obtained by calling `java.util.Locale.getAvailableLocales()` and substituting all underscores in the result with a hyphens. If a language argument is omitted or blank, then the default system language is used.

Time zone arguments can be specified in any identifier recognizable by `java.util.TimeZone.getTimeZone()`. A list of identifies understood by the system can be obtained by calling `java.util.TimeZone.getAvailableIDs()`. If a time zone argument is omitted or blank, then the default system time zone is used.

## XPath Evaluation

Arguments to some conditions and actions take an XPath 1.0 expression. This XPath is evaluated with the following context:

- ♦ The context node is the current operation unless otherwise specified in the description of the expression.
- ♦ The context position and size are 1.
- ♦ Available variables
  - ♦ Those available as parameters to style sheets within the Identity Manager Metadirectory engine (currently fromNDS, srcQueryProcessor, destQueryProcessor, srcCommandProcessor, destCommandProcessor, and dnConverter.)
  - ♦ Global configuration variables.
  - ♦ Local policy variables.
  - ♦ If there is a name conflict between the different variable sources then the order of precedence is local (policy scope), local (driver scope), global.
  - ♦ Because of the XPath syntax, any variable that has a colon character in its name is not accessible from XPath.
- ♦ Namespaces that are declared on <policy>.
- ♦ Available functions
  - ♦ All built-in XPath 1.0 functions
  - ♦ Java extension functions as provided by NXSL.
    - ♦ Namespaces declarations to associate a prefix with a Java class must be declared on <policy>.

## Example

```
<policy>
  <description>My policy</description>
  <include name="..\..\Library\My shared policy"/>
  <rule>
    <description>Rule to disallow moving a user</description>
    <comment>This rule was added because under no circumstances do we ever want to
perform a move.</comment>
    <conditions>
      <and>
        <if-class-name op="equal" mode="nocase">User</if-class-name>
        <if-operation op="equal">move</if-operation>
      </and>
    </conditions>
    <actions>
      <veto/>
    </actions>
  </rule>
  <rule>
    <description>Rule to disallow operations on a disabled user or group</
description>
    <conditions>
      <or>
        <if-class-name op="equal" mode="nocase">User</if-class-name>
```

```

    <if-class-name op="equal" mode="nocase">Group</if-class-name>
  </or>
</or>
  <if-attr op="equal" mode="nocase" name="Login Disabled">true</if-attr>
</or>
</conditions>
<actions>
  <veto/>
</actions>
</rule>
</policy>

```

## Allowed Content

| Element            | Description   |
|--------------------|---|
| <b>description</b> | Description of a <b>&lt;policy&gt;</b> or a <b>&lt;rule&gt;</b> . |
| <b>rule</b>        | Rule within a policy.   |
| <b>include</b>     | Include rules from another policy.                                |

## Attributes

None

## Content Rule

( description ? , ( rule | include ) \* )

## Parent Elements

None

# rule

Specifies a set of <actions> and a set of <conditions> under which those <actions> are performed.

## Example

See <policy>.

## Allowed Content

| Element     | Description   |
|-------------|---|
| description | Description of a <policy> or a <rule>.                        |
| comment     | Long description of a <rule>.                                 |
| conditions  | Conditions under which the actions of a <rule> are performed. |
| actions     | Actions that are performed by a <rule>.                       |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| disabled  | true   false<br>True if this element is disabled.   | false         |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( description ? , comment \* , conditions , actions )

## Parent Elements

| Element | Description |
|---------|-------------|
| policy  | A policy.   |



# token-added-entitlement

Expands to the granted values of the named entitlement in the current operation. If its parent element is `<arg-node-set>`, then all the available values are returned as `<entitlement-impl>` elements in a node set. Otherwise, the first available value is returned as a string.

## Example

```
<token-added-entitlement name="manager"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the variable. Supports variable expansion.                               | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                          | Description                        |
|----------------------------------|------------------------------------|
| <code>arg-association</code>     | Association argument.              |
| <code>arg-component</code>       | Component argument.                |
| <code>arg-dn</code>              | DN argument.                       |
| <code>arg-node-set</code>        | Node set argument.                 |
| <code>arg-password</code>        | Password argument.                 |
| <code>arg-string</code>          | String argument.                   |
| <code>arg-value</code>           | Value argument.                    |
| <code>token-base64-decode</code> | Decodes base64 data into a string. |

| Element                  | Description  |
|--------------------------|--|
| token-base64-encode      | Encodes a string into base64 data.                         |
| token-convert-time       | Converts a date/time from one format to another format.    |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring within a string.     |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node-set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-association

Expands to the association value specified in the current operation.

## Example

```
<token-association/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                  | Description                                      |
|--------------------------|--|
| arg-association          | Association argument.                            |
| arg-component            | Component argument.                              |
| arg-dn                   | DN argument.                                     |
| arg-node-set             | Node set argument.                               |
| arg-password             | Password argument.                               |
| arg-string               | String argument.                                 |
| arg-value                | Value argument.                                  |
| token-base64-decode      | Decodes base64 data into a string.               |
| token-base64-encode      | Encodes a string into base64 data.               |
| token-convert-time       | Converts a date/time from one format to another. |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.   |
| token-escape-for-src-dn  | Converts a string for use in a source DN.        |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-join</code>          | Joins a node set into a string.                            |
| <code>token-lower-case</code>    | Converts a string to lowercase.                            |
| <code>token-map</code>           | Maps a string through a mapping table.                     |
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring within a string.     |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

# token-attr

Expands to the attribute values of the current object in either the current operation or the source data store. It can logically be thought of as the union of <token-op-attr> and <token-src-attr>. If its parent element is <arg-node-set> then all the available <value> elements are returned as nodes in a node set. Otherwise the first available value is returned as a string.

## Example

```
<token-attr name="OU"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the attribute. Supports variable expansion.                              | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element         | Description           |
|-----------------|-----------------------|
| arg-association | Association argument. |
| arg-component   | Component argument.   |
| arg-dn          | DN argument.          |
| arg-node-set    | Node set argument.    |
| arg-password    | Password argument.    |
| arg-string      | String argument.      |
| arg-value       | Value argument.       |

| Element                  | Description  |
|--------------------------|--|
| token-base64-decode      | Decodes base64 data into a string.                         |
| token-base64-encode      | Encodes a string into base64 data.                         |
| token-convert-time       | Converts a date/time from one format to another.           |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of substring within a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-base64-decode

Decodes the result of the enclosed tokens from base64 encoded data to bytes and then converts the bytes into a string using the character set specified by the character set.

## Example

```
<token-base64-decode charset="UTF-8">  
  <token-op-attr name="data"/>  
</token-base64-decode>
```

## Allowed Content

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                      |
| arg-component            | Component argument.  |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decodes base64 data into a string.                         |
| token-base64-encode      | Encodes a string into base64 data.                         |
| token-convert-time       | Convert a date/time from one format to another.            |
| token-escape-for-dest-dn | Converts a string for use in a source destination DN.      |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses and converts a DN.                                  |
| token-replace-all        | Replaces all instances of substring within a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |

| Element                    | Description     |
|----------------------------|-----------------|
| <b>token-xml-serialize</b> | Serializes XML. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| charset   | CDATA<br><br>The character set used to convert the decoded bytes to a string. If not specified, the encoding specified by the system property file.encoding is used. Supports variable expansion. | #IMPLIED      |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-association</b> | Association argument. |
| <b>arg-component</b>   | Component argument.   |
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-node-set</b>    | Node set argument.    |
| <b>arg-password</b>    | Password argument.    |
| <b>arg-string</b>      | String argument       |
| <b>arg-value</b>       | Value argument.       |



| Element                  | Description  |
|--------------------------|--|
| token-base64-decode      | Decodes base64 data into a string.                         |
| token-base64-encode      | Encodes a string into base64 data.                         |
| token-convert-time       | Converts a date/time from one format to another.           |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node-set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring within a string.     |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-base64-encode

Converts the result of the enclosed tokens to bytes using the character set specified by the character set, and then base64 encodes the bytes.

## Example

```
<token-base64-encode charset="UTF-8">  
  <token-op-attr name="Surname"/>  
</token-base64-encode>
```

## Allowed Content

| Elements                 | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                      |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or the current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name for the current operation.  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of the current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                                 |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                     |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.  |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node set into a string.   |
| token-local-variable     | The value of a local variable.  |

| Elements                  | Description  |
|---------------------------|--|
| token-lower-case          | Converts a string to lower case.   |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | A generated unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <b>if-src-dn</b> .                     |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| charset   | CDATA<br><br>The character set used to convert the string to bytes. If not specified, the encoding specified by the system property file.encoding is used. Supports variable expansion. | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element             | Description                                      |
|---------------------|--|
| arg-association     | Association argument.                            |
| arg-component       | Component argument.                              |
| arg-dn              | DN argument.                                     |
| arg-node-set        | Node set argument.                               |
| arg-password        | Password argument.                               |
| arg-string          | String argument.                                 |
| arg-value           | Value argument.                                  |
| token-base64-decode | Decodes base64 data into a string.               |
| token-base64-encode | Encodes a string into base64 data.               |
| token-convert-time  | Converts a date/time from one format to another. |

| Element                  | Description  |
|--------------------------|--|
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring within a string.     |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-char

Expands to the character specified by the Unicode code point specified by the value.

## Example

```
<token-char value="10"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |
| value     | CDATA<br><br>The Unicode code point of the character. Supports variable expansion.            | #REQUIRED     |

## Content Declaration

Empty

## Parent Elements

| Element             | Description                        |
|---------------------|------------------------------------|
| arg-actions         | Association argument.              |
| arg-component       | Component argument.                |
| arg-dn              | DN argument.                       |
| arg-node-set        | Node set argument.                 |
| arg-password        | Password argument.                 |
| arg-string          | String argument.                   |
| arg-value           | Value argument.                    |
| token-base64-decode | Decodes base64 data into a string. |
| token-base64-encode | Encodes a string into base64 data. |

| Element                  | Description  |
|--------------------------|--|
| token-convert-time       | Converts a date/time from one format to another.           |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring within a string.     |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-class-name

Expands to the object class name specified in the current operation.

## Example

```
<token-class-name/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                  | Description                                      |
|--------------------------|--|
| arg-association          | Association argument.                            |
| arg-component            | Component argument.                              |
| arg-dn                   | DN argument.                                     |
| arg-node-set             | Node set argument.                               |
| arg-password             | Password argument.                               |
| arg-string               | String argument                                  |
| arg-value                | Value argument.                                  |
| token-base64-decode      | Decodes base64 data into a string.               |
| token-base64-encode      | Encodes a string into base64 data.               |
| token-convert-time       | Converts a date/time from one format to another. |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.   |
| token-escape-for-src-dn  | Converts a string for use in a source DN.        |



| Element                          | Description  |
|----------------------------------|--|
| <code>token-join</code>          | Joins a node-set into a string.                            |
| <code>token-lower-case</code>    | Converts a string to lowercase.                            |
| <code>token-map</code>           | Maps a string through a mapping table.                     |
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring within a string.     |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

# token-convert-time

Converts the date/time represented by the result of the enclosed tokens from the format, language and time zone specified by src-format, src-lang, and src-tz, to the format, language, and time zone specified by dest-format, dest-lang, and dest-tz and adds an optional offset time specified by offset and offset-unit. See [“Date/Time Parameters” on page 365](#) for information on specifying formats, languages, and time zones.

## Example

```
<token-convert-time src-format="MM/dd/YYYY" src-lang="en-US" src-tz="MST" dest-
format="dd/MM/YYYY" src-lang="en-US" src-tz="MST"/>
  <token-op-attr name="birthdate"/>
</token-convert-time>
```

## Allowed Content

| Element                                  | Description   |
|--|---|
| <a href="#">token-added-entitlement</a>  | The values of an entitlement granted in the current operation.                                  |
| <a href="#">token-association</a>        | The association value from the current operation.   |
| <a href="#">token-attr</a>               | The values of an attribute in the current operation or current object in the source data store. |
| <a href="#">token-base64-decode</a>      | Decodes base64 data into a string.  |
| <a href="#">token-base64-encode</a>      | Encodes a string into base64 data.  |
| <a href="#">token-char</a>               | A Unicode character.  |
| <a href="#">token-class-name</a>         | The object class name from the current operation  |
| <a href="#">token-convert-time</a>       | Converts a date/time from one format to another.  |
| <a href="#">token-dest-attr</a>          | The values of an attribute of current object in the destination data store.                     |
| <a href="#">token-dest-dn</a>            | A value derived from the destination DN from the current operation.                             |
| <a href="#">token-dest-name</a>          | The unqualified RDN derived from the destination DN from the current operation.                 |
| <a href="#">token-document</a>           | Reads an XML document.  |
| <a href="#">token-entitlement</a>        | The values of a granted entitlement of the current object.                                      |
| <a href="#">token-escape-for-dest-dn</a> | Converts a string for use in a destination DN.  |
| <a href="#">token-escape-for-src-dn</a>  | Converts a string for use in a source DN.   |
| <a href="#">token-generate-password</a>  | Generates a random password.  |

| Element                   | Description  |
|---------------------------|--|
| token-global-variable     | The value of a global variable.  |
| token-join                | Joins a node-set into a string.  |
| token-local-variable      | The value of a local variable.   |
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |

| Element                          | Description                        |
|----------------------------------|------------------------------------|
| <code>token-xml-serialize</code> | Serializes XML.                    |
| <code>token-xpath</code>         | The result of an XPath expression. |

## Attributes

| Attribute                | Possible Values  | Default Value |
|--------------------------|--|---------------|
| <code>dest-format</code> | CDATA<br><br>The destination date/time format.<br>Supports variable expansion.   | #REQUIRED     |
| <code>dest-lang</code>   | CDATA<br><br>The destination language<br>(defaults to the current system<br>language). Supports variable<br>expansion.     | #IMPLIED      |
| <code>dest-tz</code>     | CDATA<br><br>The destination time zone<br>(defaults to the current system<br>time zone). Supports variable<br>expansion.   | #IMPLIED      |
| <code>notrace</code>     | true   false<br><br>True if this element should not be<br>traced during execution of the<br>policy.                        | false         |
| <code>offset</code>      | CDATA<br><br>The time offset (a negative<br>number subtracts the time<br>interval). Supports variable<br>expansion.        | #IMPLIED      |
| <code>offset-unit</code> | second   minute   hour   day  <br>week   month   year<br><br>The units of the time offset.<br>Supports variable expansion. | day           |
| <code>src-format</code>  | CDATA<br><br>The source date/time format.<br>Supports variable expansion.  | #REQUIRED     |
| <code>src-lang</code>    | CDATA<br><br>The source language (defaults to<br>the current system language).<br>Supports variable expansion.             | #IMPLIED      |

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| src-tz    | CDATA<br><br>The source time zone (defaults to the current system time zone).<br>Supports variable expansion. | #IMPLIED      |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath )

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument  |
| arg-value                | Value argument.  |
| token-base64-decode      | Decodes base64 data into a string.                     |
| token-base64-encode      | Encodes a string into base64 data.                     |
| token-convert-time       | Converts a date/time from one format to another.       |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.         |
| token-escape-for-src-dn  | Converts a string for use in a source DN.              |
| token-join               | Joins a node-set into a string.                        |
| token-lower-case         | Converts a string to lowercase.                        |
| token-map                | Maps a string through a mapping table.                 |
| token-parse-dn           | Parses or converts a DN.                               |
| token-replace-all        | Replaces all instances of a substring within a string. |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

## token-dest-attr

Expands to the attribute values of the current object in the destination data store. If its parent element is `<arg-node-set>`, then all the available `<value>` elements are returned as nodes in a node set. Otherwise, the first available value is returned as a string.

### Example

```
<token-dest-attr name="OU"/>
```

### Allowed Content

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-association</code> | Association argument. |

### Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of the object to read.<br><br>Can be required (for schema mapping purposes) if the object is other than the current object. | #IMPLIED      |
| name       | CDATA<br><br>Name of the attribute.   | #REQUIRED     |
| notrace    | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

### Content Rule

( `arg-dn` | `arg-association` ) ?

### Parent Elements

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-association</code> | Association argument. |

| Element                  | Description  |
|--------------------------|--|
| arg-component            | Component argument.  |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument  |
| arg-value                | Value argument.  |
| token-base64-decode      | Decodes base64 data into a string.                         |
| token-base64-encode      | Encodes a string into base64 data.                         |
| token-convert-time       | Converts a date/time from one format to another.           |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node-set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring within a string.     |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



## token-dest-dn

Expands to the destination DN specified in the current operation or a portion thereof. If start and length are not specified or are set to the default values {0,-1}, then the entire DN is used; otherwise only the portion of the DN specified by start and length is used. The format of the DN is automatically set to the format of the source data store if convert attribute is set to true.

### Example

```
<token-dest-dn/>
```

### Allowed Content

EMPTY

### Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| convert   | true   false<br><br>Converts to the DN format of source data store.   | false         |
| length    | CDATA<br><br>The number of DN segments to include negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments, a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc. | -1            |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| start     | CDATA<br><br>The segment index to start with 0 is the rootmost segment. >0 is an offset from the rootmost segment. -1 is the leafmost segment. <-1 is an offset from the leafmost segment towards the rootmost segment.             | 0             |

### Content Declaration

Empty

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                      |
| arg-component            | Component argument.  |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument  |
| arg-value                | Value argument.  |
| token-base64-decode      | Decodes base64 data into a string.                         |
| token-base64-encode      | Encodes a string into base64 data.                         |
| token-convert-time       | Converts a date/time from one format to another.           |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node-set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring within a string.     |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-dest-name

Expands to the unqualified RDN of the destination DN specified in the current operation.

## Example

```
<token-dest-name/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( #PCDATA )

## Parent Elements

| Element                  | Description                                      |
|--------------------------|--|
| arg-association          | Association argument.                            |
| arg-component            | Component argument.                              |
| arg-dn                   | DN argument.                                     |
| arg-node-set             | Node set argument.                               |
| arg-password             | Password argument.                               |
| arg-string               | String argument                                  |
| arg-value                | Value argument.                                  |
| token-base64-decode      | Decodes base64 data into a string.               |
| token-base64-encode      | Encodes a string into base64 data.               |
| token-convert-time       | Converts a date/time from one format to another. |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.   |
| token-escape-for-src-dn  | Converts a string for use in a source DN.        |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-join</code>          | Joins a node-set into a string.                            |
| <code>token-lower-case</code>    | Converts a string to lowercase.                            |
| <code>token-map</code>           | Maps a string through a mapping table.                     |
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring within a string.     |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

# token-document

Reads the XML document pointed to by the URI specified by the **arg-string** and returns the document node in a node set. The URI can be relative to the URI of the including policy. If the URI or DN cannot be resolved to a well-formed XML document, the result is an empty node set.

## Example

```
<token-document>
  <arg-string>
    <token-text>../MyDriver#DirXML-DriverFilter</token-text>
  </arg-string>
</token-document>
```

## Allowed Content

| Element           | Description      |
|-------------------|------------------|
| <b>arg-string</b> | String argument. |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-string )

## Parent Elements

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-association</b> | Association argument. |
| <b>arg-component</b>   | Component argument.   |
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-node-set</b>    | Node set argument.    |
| <b>arg-password</b>    | Password argument.    |
| <b>arg-string</b>      | String argument       |

| Element                  | Description  |
|--------------------------|--|
| arg-value                | Value argument.  |
| token-base64-decode      | Decodes base64 data into a string.                         |
| token-base64-encode      | Encodes a string into base64 data.                         |
| token-convert-time       | Converts a date/time from one format to another.           |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.             |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                  |
| token-join               | Joins a node-set into a string.                            |
| token-lower-case         | Converts a string to lowercase.                            |
| token-map                | Maps a string through a mapping table.                     |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring within a string.     |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-entitlement

Expands to the granted values of the named entitlement for the current object. If its parent element is `<arg-node-set>`, then all the available values are returned as `<entitlement-impl>` elements in a node set. Otherwise, the first available value is returned as a string.

## Example

```
<token-entitlement name="manager"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the attribute. Supports variable expansion.                              | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                          | Description                        |
|----------------------------------|------------------------------------|
| <code>arg-association</code>     | Association argument.              |
| <code>arg-component</code>       | Component argument.                |
| <code>arg-dn</code>              | DN argument.                       |
| <code>arg-node-set</code>        | Node set argument.                 |
| <code>arg-password</code>        | Password argument.                 |
| <code>arg-string</code>          | String argument                    |
| <code>arg-value</code>           | Value argument.                    |
| <code>token-base64-decode</code> | Decodes base64 data into a string. |

| Element                               | Description  |
|---------------------------------------|--|
| <code>token-base64-encode</code>      | Encodes a string into base64 data.                         |
| <code>token-convert-time</code>       | Converts a date/time from one format to another.           |
| <code>token-escape-for-dest-dn</code> | Converts a string for use in a destination DN.             |
| <code>token-escape-for-src-dn</code>  | Converts a string for use in a source DN.                  |
| <code>token-join</code>               | Joins a node-set into a string.                            |
| <code>token-lower-case</code>         | Converts a string to lowercase.                            |
| <code>token-map</code>                | Maps a string through a mapping table.                     |
| <code>token-parse-dn</code>           | Parses or converts a DN.                                   |
| <code>token-replace-all</code>        | Replaces all instances of a substring within a string.     |
| <code>token-replace-first</code>      | Replaces a single instance of a substring within a string. |
| <code>token-split</code>              | Splits a string into a node set.                           |
| <code>token-substring</code>          | Substring of a string.                                     |
| <code>token-upper-case</code>         | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>          | Parses XML.  |
| <code>token-xml-serialize</code>      | Serializes XML.  |



# token-escape-for-dest-dn

Expands to a version of the expansion of the concatenation of the enclosed tokens, which has been escaped for use in a DN according to the rules of the destination DN format.

## Example

```
<token-escape-for-dest-dn>  
  <token-attr name="Surname"/>  
</token-escape-for-dest-dn>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |

| Element                   | Description  |
|---------------------------|--|
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                  | Description                                      |
|--------------------------|--|
| arg-association          | Association argument.                            |
| arg-component            | Component argument.                              |
| arg-dn                   | DN argument.                                     |
| arg-node-set             | Node set argument.                               |
| arg-password             | Password argument.                               |
| arg-string               | String argument                                  |
| arg-value                | Value argument.                                  |
| token-base64-decode      | Decodes base64 data into a string.               |
| token-base64-encode      | Encodes a string into base64 data.               |
| token-convert-time       | Converts a date/time from one format to another. |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.   |
| token-escape-for-src-dn  | Converts a string for use in a source DN.        |
| token-join               | Joins a node-set into a string.                  |
| token-lower-case         | Converts a string to lowercase.                  |
| token-map                | Maps a string through a mapping table.           |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring within a string.     |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

# token-escape-for-src-dn

Expands to a version of the expansion of the concatenation of the enclosed tokens that has been escaped for use in a DN according to the rules of the source DN format.

## Example

```
<token-escape-for-src-dn>  
  <token-attr name="Surname"/>  
</token-escape-for-src-dn>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |

| Element                   | Description  |
|---------------------------|--|
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                  | Description                                      |
|--------------------------|--|
| arg-association          | Association argument.                            |
| arg-component            | Component argument.                              |
| arg-dn                   | DN argument.                                     |
| arg-node-set             | Node set argument.                               |
| arg-password             | Password argument.                               |
| arg-string               | String argument                                  |
| arg-value                | Value argument.                                  |
| token-base64-decode      | Decodes base64 data into a string.               |
| token-base64-encode      | Encodes a string into base64 data.               |
| token-convert-time       | Converts a date/time from one format to another. |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.   |
| token-escape-for-src-dn  | Converts a string for use in a source DN.        |
| token-join               | Joins a node-set into a string.                  |
| token-lower-case         | Converts a string to lowercase.                  |
| token-map                | Maps a string through a mapping table.           |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring within a string.     |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |



# token-generate-password

Expands to a randomly generated password that conforms to the password policy specified by policy-dn. If policy-dn is not specified, the effective password policy of the current object in eDirectory is used. If the current object does not yet exist in eDirectory (e.g. the target of an add operation on the publisher channel), the effective password policy of the target container is used.

## Example

```
<token-generate-password policy-dn="..\my password policy"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.                                    | false         |
| policy-dn | CDATA<br><br>Slash form DN of a nspmPasswordPolicy object. Can be relative to the including policy. Supports variable expansion. | #IMPLIED      |

## Content Declaration

Empty

## Parent Elements

| Element         | Description           |
|-----------------|-----------------------|
| arg-association | Association argument. |
| arg-component   | Component argument.   |
| arg-dn          | DN argument.          |
| arg-node-set    | Node set argument.    |
| arg-password    | Password argument.    |
| arg-string      | String argument.      |

| Element                  | Description  |
|--------------------------|--|
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-global-variable

Expands to the value of the named global configuration variable.

## Example

```
<token-global-variable name="Fred"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the variable. Supports variable expansion.                               | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element             | Description                       |
|---------------------|-----------------------------------|
| arg-association     | Association argument.             |
| arg-component       | Component argument.               |
| arg-dn              | DN argument.                      |
| arg-node-set        | Node set argument.                |
| arg-password        | Password argument.                |
| arg-string          | String argument.                  |
| arg-value           | Value argument.                   |
| token-base64-decode | Decode base64 data into a string. |
| token-base64-encode | Encode a string into base64 data. |

| Element                  | Description  |
|--------------------------|--|
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-join

Joins the values of the nodes in the node-set result of the enclosed tokens, separating the values by the characters specified by the delimiter. If csv is true, then CSV quoting rules are applied to the values.

## Example

```
<!-- combine all of the members of the group into a CSV record -->
<token-join delimiter="," csv="true">
  <token-op-attr name="Member"/>
</token-join>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |

| Element                   | Description  |
|---------------------------|--|
| token-local-variable      | The value of a local variable.   |
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| csv       | true   false<br><br>Applies CSV quoting to values.  | false         |
| delimiter | CDATA<br><br>The string use to delimit the joined values. Supports variable expansion.        | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath | token-query | token-split ) +

## Parent Elements

| Element             | Description  |
|---------------------|--|
| arg-association     | Association argument.                                  |
| arg-component       | Component argument.                                    |
| arg-dn              | DN argument.   |
| arg-node-set        | Node set argument.                                     |
| arg-password        | Password argument.                                     |
| arg-string          | String argument.                                       |
| arg-value           | Value argument.  |
| token-base64-decode | Decode base64 data into a string.                      |
| token-base64-encode | Encode a string into base64 data.                      |
| token-convert-time  | Convert a data/time from one format to another format. |

| Element                  | Description  |
|--------------------------|--|
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



# token-local-variable

Expands to the value of the named local variable. If its parent element is not **<arg-node-set>** and the variable holds a node set, then the string value of the node set is returned. If the same local variable exists in both the policy scope and the driver scope, the variable in the policy scope takes precedence.

## Example

```
<token-local-variable name="myVariable"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the variable. Supports variable expansion.                               | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-association</b> | Association argument. |
| <b>arg-component</b>   | Component argument.   |
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-node-set</b>    | Node set argument.    |
| <b>arg-password</b>    | Password argument.    |
| <b>arg-string</b>      | String argument.      |
| <b>arg-value</b>       | Value argument.       |

| Element                  | Description  |
|--------------------------|--|
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-lower-case

Converts each character of the result of the enclosed tokens to lowercase.

## Example

```
<token-lower-case>  
  <token-attr name="Surname"/>  
</token-lower-case>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |
| token-lower-case         | Converts a string to lowercase.   |

| Element                   | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the attribute. Supports variable expansion.                              | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument.                                       |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                      |
| token-base64-encode      | Encode a string into base64 data.                      |
| token-convert-time       | Convert a data/time from one format to another format. |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.        |
| token-escape-for-src-dn  | Convert a string for use in a source DN.               |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-join</code>          | Join a node set into a string.                             |
| <code>token-lower-case</code>    | Convert a string to lowercase.                             |
| <code>token-map</code>           | Map a string through a mapping table.                      |
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring with a string.       |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

# token-map

Maps the result of the enclosed tokens from the values specified by the src column to the dest column in the mapping table specified by table.

## Remarks

The table attribute should be the slash form DN of the DirXML-Resource object containing the mapping table to be used. The DN may be relative to the including policy.

If this token is evaluated in a context where a node set result is expected and multiple rows are matched by the value being mapped, then a node set is returned that contains the values from the destination column of each matching row. Otherwise only the value from the first matching row is returned.

If no rows are matched by the value being mapped and a non-empty value for default-value is provided, then the token returns the value of default-value, otherwise it returns the empty string if being evaluated in a context that is expecting a string, or an empty node-set if evaluated in a context that is expecting a node-set.

## Example

```
<token-map table="./Department Table" src="dept" dest="code">
  <token-op-attr name="OU"/>
</token-map>
```

## Allowed Content

| Element                                 | Description   |
|---|---|
| <a href="#">token-added-entitlement</a> | The values of an entitlement granted in the current operation.                                  |
| <a href="#">token-association</a>       | The association value from the current operation.   |
| <a href="#">token-attr</a>              | The values of an attribute in the current operation or current object in the source data store. |
| <a href="#">token-base64-decode</a>     | Decodes base64 data into a string.  |
| <a href="#">token-base64-encode</a>     | Encodes a string into base64 data.  |
| <a href="#">token-char</a>              | A Unicode character.  |
| <a href="#">token-class-name</a>        | The object class name from the current operation  |
| <a href="#">token-convert-time</a>      | Converts a date/time from one format to another.  |
| <a href="#">token-dest-attr</a>         | The values of an attribute of current object in the destination data store.                     |
| <a href="#">token-dest-dn</a>           | A value derived from the destination DN from the current operation.                             |

| Element                   | Description   |
|---------------------------|---|
| token-dest-name           | The unqualified RDN derived from the destination DN from the current operation. |
| token-document            | Reads an XML document.  |
| token-entitlement         | The values of a granted entitlement of the current object.                      |
| token-escape-for-dest-dn  | Converts a string for use in a destination DN.                                  |
| token-escape-for-src-dn   | Converts a string for use in a source DN.                                       |
| token-generate-password   | Generates a random password.  |
| token-global-variable     | The value of a global variable.   |
| token-join                | Joins a node-set into a string.   |
| token-local-variable      | The value of a local variable.  |
| token-lower-case          | Converts a string to lowercase.   |
| token-map                 | Maps a string through a mapping table.  |
| token-named-password      | The value of the named password.  |
| token-op-attr             | The values of an attribute in the current operation.                            |
| token-op-property         | The value of an operation property.   |
| token-operation           | The name of the current operation.  |
| token-parse-dn            | Parses or converts a DN.  |
| token-password            | The value of the password in the current operation.                             |
| token-query               | Queries the source or destination data store.                                   |
| token-removed-attr        | The values of an attribute removed in the current operation.                    |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.                  |
| token-replace-all         | Replaces all instances of a substring within a string.                          |
| token-replace-first       | Replaces a single instance of a substring within a string.                      |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.              |
| token-split               | Splits a string into a node set.  |
| token-src-attr            | The values of an attribute of the current object in the source data store.      |
| token-src-dn              | A value derived from the source DN from the current operation.                  |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.          |



| Element                             | Description  |
|-------------------------------------|--|
| <code>token-substring</code>        | Substring of a string.                                       |
| <code>token-text</code>             | Constant text.   |
| <code>token-time</code>             | The current date/time.                                       |
| <code>token-unique-name</code>      | Generates a unique name.                                     |
| <code>token-unmatched-src-dn</code> | A DN relative to the one matched by <code>if-src-dn</code> . |
| <code>token-upper-case</code>       | Converts a string to uppercase.                              |
| <code>token-xml-parse</code>        | Parses XML.  |
| <code>token-xml-serialize</code>    | Serializes XML.  |
| <code>token-xpath</code>            | The result of an XPath expression.                           |

## Attributes

| Attribute                  | Possible Values  | Default Value |
|----------------------------|--|---------------|
| <code>default-value</code> | CDATA<br><br>Default value for the destination column. Supports variable expansion.  | #IMPLIED      |
| <code>dest</code>          | CDATA<br><br>Name of the destination column. Supports variable expansion.  | #REQUIRED     |
| <code>notrace</code>       | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |
| <code>src</code>           | CDATA<br><br>Name of the source column. Supports variable expansion.   | #REQUIRED     |
| <code>table</code>         | CDATA<br><br>Slash form DN of a DirXML-Resource object containing the mapping table. Can be relative to the including policy. Supports variable expansion. | #REQUIRED     |

## Content Rule

( `token-added-entitlement` | `token-association` | `token-attr` | `token-base64-decode` | `token-base64-encode` | `token-char` | `token-class-name` | `token-convert-time` | `token-dest-attr` | `token-dest-dn` | `token-dest-name` | `token-document` | `token-entitlement` | `token-escape-for-dest-dn` | `token-escape-for-src-dn`

| token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                               | Description  |
|---------------------------------------|--|
| <code>arg-association</code>          | Association argument.                                      |
| <code>arg-component</code>            | Component argument.  |
| <code>arg-dn</code>                   | DN argument.   |
| <code>arg-node-set</code>             | Node set argument.   |
| <code>arg-password</code>             | Password argument.   |
| <code>arg-string</code>               | String argument.   |
| <code>arg-value</code>                | Value argument.  |
| <code>token-base64-decode</code>      | Decode base64 data into a string.                          |
| <code>token-base64-encode</code>      | Encode a string into base64 data.                          |
| <code>token-convert-time</code>       | Convert a data/time from one format to another format.     |
| <code>token-escape-for-dest-dn</code> | Convert a string for use in the destination DN.            |
| <code>token-escape-for-src-dn</code>  | Convert a string for use in a source DN.                   |
| <code>token-join</code>               | Join a node set into a string.                             |
| <code>token-lower-case</code>         | Convert a string to lowercase.                             |
| <code>token-map</code>                | Map a string through a mapping table.                      |
| <code>token-parse-dn</code>           | Parses or converts a DN.                                   |
| <code>token-replace-all</code>        | Replaces all instances of a substring with a string.       |
| <code>token-replace-first</code>      | Replaces a single instance of a substring within a string. |
| <code>token-split</code>              | Splits a string into a node set.                           |
| <code>token-substring</code>          | Substring of a string.                                     |
| <code>token-upper-case</code>         | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>          | Parses XML.  |
| <code>token-xml-serialize</code>      | Serializes XML.  |

# token-named-password

Expands to the named password from the driver.

## Example

```
<token-named-password name="extraPassword"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the attribute. Supports variable expansion.                              | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element             | Description                       |
|---------------------|-----------------------------------|
| arg-association     | Association argument.             |
| arg-component       | Component argument.               |
| arg-dn              | DN argument.                      |
| arg-node-set        | Node set argument.                |
| arg-password        | Password argument.                |
| arg-string          | String argument.                  |
| arg-value           | Value argument.                   |
| token-base64-decode | Decode base64 data into a string. |
| token-base64-encode | Encode a string into base64 data. |

| Element                  | Description  |
|--------------------------|--|
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-op-attr

Expands to the attribute values in the current operation (<add-attr>, <add-value> or <attr>). If it's parent element is <arg-node-set>, then all the available <value> elements are returned as nodes in a node set. Otherwise, the first available value is returned as a string.

## Example

```
<token-op-attr name="OU"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the attribute. Supports variable expansion.                              | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element             | Description                       |
|---------------------|-----------------------------------|
| arg-association     | Association argument.             |
| arg-component       | Component argument.               |
| arg-dn              | DN argument.                      |
| arg-node-set        | Node set argument.                |
| arg-password        | Password argument.                |
| arg-string          | String argument.                  |
| arg-value           | Value argument.                   |
| token-base64-decode | Decode base64 data into a string. |

| Element                  | Description  |
|--------------------------|--|
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-op-property

Expands to the value of the named operation property on the current operation.

## Example

```
<token-op-property name="myProperty"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br><br>Name of the attribute. Supports variable expansion.                              | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element             | Description                       |
|---------------------|-----------------------------------|
| arg-association     | Association argument.             |
| arg-component       | Component argument.               |
| arg-dn              | DN argument.                      |
| arg-node-set        | Node set argument.                |
| arg-password        | Password argument.                |
| arg-string          | String argument.                  |
| arg-value           | Value argument.                   |
| token-base64-decode | Decode base64 data into a string. |
| token-base64-encode | Encode a string into base64 data. |

| Element                  | Description  |
|--------------------------|--|
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



# token-operation

Expands to the name of the current operation.

## Example

```
<token-operation/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument.                                       |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                      |
| token-base64-encode      | Encode a string into base64 data.                      |
| token-convert-time       | Convert a data/time from one format to another format. |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.        |

| Element                 | Description  |
|-------------------------|--|
| token-escape-for-src-dn | Convert a string for use in a source DN.                   |
| token-join              | Join a node set into a string.                             |
| token-lower-case        | Convert a string to lowercase.                             |
| token-map               | Map a string through a mapping table.                      |
| token-parse-dn          | Parses or converts a DN.                                   |
| token-replace-all       | Replaces all instances of a substring with a string.       |
| token-replace-first     | Replaces a single instance of a substring within a string. |
| token-split             | Splits a string into a node set.                           |
| token-substring         | Substring of a string.                                     |
| token-upper-case        | Converts a string to uppercase.                            |
| token-xml-parse         | Parses XML.  |
| token-xml-serialize     | Serializes XML.  |

# token-parse-dn

Expands to a version of the DN specified by expansion of the concatenation of the enclosed tokens. The DN is parsed according the format specified by <src-dn-format>. The portion of the DN specified by start and length is then converted to the format specified by <dest-dn-format>.

## Remarks

<src-dn-delims> and <dest-dn-delims> are used to specify custom DN formats. The eight characters that make up the delimiter set are defined as follows:

- ♦ Typed Name Boolean Flag: 0 means names are not typed, 1 means names are typed
- ♦ Unicode No-Map Character Boolean Flag: 0 means don't output or interpret unmappable Unicode characters as escaped hex digit strings, for example \FEFF. The Unicode characters 0xfeff, 0xfffe, 0xfffd, and 0xffff are not accepted by eDirectory.
- ♦ Relative RDN Delimiter
- ♦ RDN Delimiter
- ♦ Name Divider
- ♦ Name Value Delimiter
- ♦ Wildcard Character
- ♦ Escape Character

If RDN Delimiter and Relative RDN Delimiter are the same character, then the orientation of the name is root right, otherwise the orientation is root left.

If there are more than eight characters in the delimiter set, the extra characters are all considered to be characters that need to be escaped but have no other special meaning.

## Example

```
<token-parse-dn src-dn-format="src-dn" dest-dn-format="dest-dn" start="0"
length="-1">
  <token-op-attr name="Group Membership"/>
</token-parse-dn>
```

## Allowed Content

| Element                        | Description   |
|--------------------------------|---|
| <b>token-added-entitlement</b> | The values of an entitlement granted in the current operation.                                  |
| <b>token-association</b>       | The association value from the current operation.   |
| <b>token-attr</b>              | The values of an attribute in the current operation or current object in the source data store. |
| <b>token-base64-decode</b>     | Decodes base64 data into a string.  |
| <b>token-base64-encode</b>     | Encodes a string into base64 data.  |

| Element                   | Description   |
|---------------------------|---|
| token-char                | A Unicode character.  |
| token-class-name          | The object class name from the current operation                                |
| token-convert-time        | Converts a date/time from one format to another.                                |
| token-dest-attr           | The values of an attribute of current object in the destination data store.     |
| token-dest-dn             | A value derived from the destination DN from the current operation.             |
| token-dest-name           | The unqualified RDN derived from the destination DN from the current operation. |
| token-document            | Reads an XML document.  |
| token-entitlement         | The values of a granted entitlement of the current object.                      |
| token-escape-for-dest-dn  | Converts a string for use in a destination DN.                                  |
| token-escape-for-src-dn   | Converts a string for use in a source DN.                                       |
| token-generate-password   | Generates a random password.  |
| token-global-variable     | The value of a global variable.   |
| token-join                | Joins a node-set into a string.   |
| token-local-variable      | The value of a local variable.  |
| token-lower-case          | Converts a string to lowercase.   |
| token-map                 | Maps a string through a mapping table.  |
| token-named-password      | The value of the named password.  |
| token-op-attr             | The values of an attribute in the current operation.                            |
| token-op-property         | The value of an operation property.   |
| token-operation           | The name of the current operation.  |
| token-parse-dn            | Parses or converts a DN.  |
| token-password            | The value of the password in the current operation.                             |
| token-query               | Queries the source or destination data store.                                   |
| token-removed-attr        | The values of an attribute removed in the current operation.                    |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.                  |
| token-replace-all         | Replaces all instances of a substring within a string.                          |
| token-replace-first       | Replaces a single instance of a substring within a string.                      |

| Element                | Description  |
|------------------------|--|
| token-resolve          | Resolves a DN to an association key or an association key to a DN.         |
| token-split            | Splits a string into a node set.   |
| token-src-attr         | The values of an attribute of the current object in the source data store. |
| token-src-dn           | A value derived from the source DN from the current operation.             |
| token-src-name         | The unqualified RDN derived from source DN from the current operation.     |
| token-substring        | Substring of a string.   |
| token-text             | Constant text.   |
| token-time             | The current date/time.   |
| token-unique-name      | Generates a unique name.   |
| token-unmatched-src-dn | A DN relative to the one matched by <b>if-src-dn</b> .                     |
| token-upper-case       | Converts a string to uppercase.  |
| token-xml-parse        | Parses XML.  |
| token-xml-serialize    | Serializes XML.  |
| token-xpath            | The result of an XPath expression.   |

## Attributes

| Attribute      | Possible Values  | Default Value |
|----------------|--|---------------|
| dest-dn-delims | CDATA<br><br>Specifies the custom DN delimiter set when dest-dn-format="custom".   | #IMPLIED      |
| dest-dn-format | src-dn   dest-dn   dot   qualified-dot   slash   qualified-slash   ldap   custom<br><br>The format used to output the parsed DN. | dest-dn       |

| Attribute     | Possible Values  | Default Value |
|---------------|--|---------------|
| length        | CDATA<br><br>The number of DN segments to include negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc. | -1            |
| notrace       | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |
| src-dn-delims | CDATA<br><br>Specifies the custom DN delimiter set when src-dn-format="custom"   | #IMPLIED      |
| src-dn-format | src-dn   dest-dn   dot   qualified-dot   slash   qualified-slash   ldap   custom<br><br>The format used to parse the enclosed DN.  | src-dn        |
| start         | CDATA<br><br>The segment index to start with: 0 is the rootmost segment. >0 is an offset from the rootmost segment. -1 is the leafmost segment. <-1 is an offset from the leafmost segment towards the rootmost segment.           | 0             |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                      |
| arg-component            | Component argument.  |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-password

Expands to the password specified in the current operation.

## Example

```
<token-password/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument.                                       |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                      |
| token-base64-encode      | Encode a string into base64 data.                      |
| token-convert-time       | Convert a data/time from one format to another format. |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.        |



| Element                 | Description  |
|-------------------------|--|
| token-escape-for-src-dn | Convert a string for use in a source DN.                   |
| token-join              | Join a node set into a string.                             |
| token-lower-case        | Convert a string to lowercase.                             |
| token-map               | Map a string through a mapping table.                      |
| token-parse-dn          | Parses or converts a DN.                                   |
| token-replace-all       | Replaces all instances of a substring with a string.       |
| token-replace-first     | Replaces a single instance of a substring within a string. |
| token-split             | Splits a string into a node set.                           |
| token-substring         | Substring of a string.                                     |
| token-upper-case        | Converts a string to uppercase.                            |
| token-xml-parse         | Parses XML.  |
| token-xml-serialize     | Serializes XML.  |

# token-query

Causes a **<query>** to be performed in the source or destination data store and returns the resulting **<instance>** elements.

## Remarks

The data store to search is specified by the data store.

The base of the query is specified by either **<arg-dn>** or **<arg-association>**. If neither are specified, then the base is the root of the data store.

The scope of the query is specified by query.

The class of the query is specified by class-name. If omitted the query looks for all classes.

The set of attributes to search for is specified by the **<arg-match-attr>** elements.

The set of attributes to return is specified by the **<arg-string>** elements. If no **<arg-string>** elements are specified then no attributes are read. If one of the **<arg-string>** evaluates to the asterisk character, then all attributes are read.

If max-result-count is specified, then **<query-ex>** is issued instead of a **<query>** and the results are returned in batches. When used in the context of a **<do-for-each>** subsequent batches (if any) are automatically retrieved.

## Example

```
<token-query scope="subordinates" class-name="User" datastore="dest">
  <arg-dn>
    <token-text>Users/</token-text>
    <token-attr name="OU"/>
  </arg-dn>
  <arg-match-attr name="CN"/>
  <arg-match-attr name="L"/>
  <arg-value>
    <token-text>Provo</token-text>
  </arg-value>
</arg-match-attr>
<arg-string>
  <token-text>Surname</token-text>
</arg-string>
<arg-string>
  <token-text>Given Name</token-text>
</arg-string>
</token-query>
```

## Allowed Content

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-association</b> | Association argument. |

| Element                        | Description                     |
|--------------------------------|---------------------------------|
| <a href="#">arg-dn</a>         | DN argument.                    |
| <a href="#">arg-match-attr</a> | Matches the attribute argument. |
| <a href="#">arg-string</a>     | String argument                 |

## Attributes

| Attribute        | Possible Values   | Default Value |
|------------------|---|---------------|
| class-name       | CDATA<br>The class name of the query.<br>Supports variable expansion.                     | #IMPLIED      |
| datastore        | src   dest<br>The data store to be queried.   | dest          |
| max-result-count | CDATA<br>The maximum number of results to return per batch.                               | #IMPLIED      |
| notrace          | true   false<br>True if this element should not be traced during execution of the policy. | false         |
| scope            | entry   subordinates   subtree<br>The scope of the query.                                 | subtree       |

## Content Rule

(( [arg-dn](#) | [arg-association](#) ) ? , [arg-match-attr](#) \* , [arg-string](#) \* )

## Parent Elements

| Element                         | Description           |
|---------------------------------|-----------------------|
| <a href="#">arg-association</a> | Association argument. |
| <a href="#">arg-component</a>   | Component argument.   |
| <a href="#">arg-dn</a>          | DN argument.          |

| Element                  | Description  |
|--------------------------|--|
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-removed-attr

Expands to the attribute values removed in the current operation (<remove-attr>). If its parent element is <arg-node-set>, then all the available <value> elements are returned as nodes in a node-set. Otherwise, the first available value is returned as a string.

## Example

```
<token-removed-attr name="OU"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br>Name of the attribute.   | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element             | Description                       |
|---------------------|-----------------------------------|
| arg-association     | Association argument.             |
| arg-component       | Component argument.               |
| arg-dn              | DN argument.                      |
| arg-node-set        | Node set argument.                |
| arg-password        | Password argument.                |
| arg-string          | String argument.                  |
| arg-value           | Value argument.                   |
| token-base64-decode | Decode base64 data into a string. |

| Element                  | Description  |
|--------------------------|--|
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-removed-entitlement

Expands to the revoked values of the named entitlement in the current operation. If its parent element is `<arg-node-set>`, then all the available values are returned as `<entitlement-impl>` elements in a node set. Otherwise, the first available value is returned as a string.

## Example

```
<token-removed-entitlement name="manager"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| name      | CDATA<br>Name of the attribute.   | #REQUIRED     |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                          | Description                       |
|----------------------------------|-----------------------------------|
| <code>arg-association</code>     | Association argument.             |
| <code>arg-component</code>       | Component argument.               |
| <code>arg-dn</code>              | DN argument.                      |
| <code>arg-node-set</code>        | Node set argument.                |
| <code>arg-password</code>        | Password argument.                |
| <code>arg-string</code>          | String argument.                  |
| <code>arg-value</code>           | Value argument.                   |
| <code>token-base64-decode</code> | Decode base64 data into a string. |

| Element                  | Description  |
|--------------------------|--|
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



# token-replace-all

Expands to a version of the expansion of the concatenation of the enclosed tokens where all matching instances of the regular expression specified by regex are replaced by the string specified by replace-with.

## Remarks

See <http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html> and [http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll\(java.lang.String\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll(java.lang.String))

The pattern options CASE\_INSENSITIVE, DOTALL, and UNICODE\_CASE are used but can be reversed using the appropriate embedded escapes.

## Example

```
<!-- remove escaping from DN in slash format -->
<token-replace-all regex="\"(.)" replace-with=\"$1">
  <token-dest-dn/>
</token-replace-all>
```

## Allowed Content

| Element                        | Description   |
|--------------------------------|---|
| <b>token-added-entitlement</b> | The values of an entitlement granted in the current operation.                                  |
| <b>token-association</b>       | The association value from the current operation.   |
| <b>token-attr</b>              | The values of an attribute in the current operation or current object in the source data store. |
| <b>token-base64-decode</b>     | Decodes base64 data into a string.  |
| <b>token-base64-encode</b>     | Encodes a string into base64 data.  |
| <b>token-char</b>              | A Unicode character.  |
| <b>token-class-name</b>        | The object class name from the current operation  |
| <b>token-convert-time</b>      | Converts a date/time from one format to another.  |
| <b>token-dest-attr</b>         | The values of an attribute of current object in the destination data store.                     |
| <b>token-dest-dn</b>           | A value derived from the destination DN from the current operation.                             |
| <b>token-dest-name</b>         | The unqualified RDN derived from the destination DN from the current operation.                 |
| <b>token-document</b>          | Reads an XML document.  |
| <b>token-entitlement</b>       | The values of a granted entitlement of the current object.                                      |

| Element                   | Description  |
|---------------------------|--|
| token-escape-for-dest-dn  | Converts a string for use in a destination DN.                             |
| token-escape-for-src-dn   | Converts a string for use in a source DN.                                  |
| token-generate-password   | Generates a random password.   |
| token-global-variable     | The value of a global variable.  |
| token-join                | Joins a node-set into a string.  |
| token-local-variable      | The value of a local variable.   |
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |

| Element                             | Description  |
|-------------------------------------|--|
| <code>token-unmatched-src-dn</code> | A DN relative to the one matched by <code>if-src-dn</code> . |
| <code>token-upper-case</code>       | Converts a string to uppercase.                              |
| <code>token-xml-parse</code>        | Parses XML.  |
| <code>token-xml-serialize</code>    | Serializes XML.  |
| <code>token-xpath</code>            | The result of an XPath expression.                           |

## Attributes

| Attribute                 | Possible Values   | Default Value |
|---------------------------|---|---------------|
| <code>notrace</code>      | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |
| <code>regex</code>        | CDATA<br><br>Regular expression that matches the substring to replace.                        | #REQUIRED     |
| <code>replace-with</code> | CDATA<br><br>Regular expression that specifies the replacement string.                        | #REQUIRED     |

## Content Rule

( `token-added-entitlement` | `token-association` | `token-attr` | `token-base64-decode` | `token-base64-encode` | `token-char` | `token-class-name` | `token-convert-time` | `token-dest-attr` | `token-dest-dn` | `token-dest-name` | `token-document` | `token-entitlement` | `token-escape-for-dest-dn` | `token-escape-for-src-dn` | `token-generate-password` | `token-global-variable` | `token-join` | `token-local-variable` | `token-lower-case` | `token-named-password` | `token-map` | `token-op-attr` | `token-op-property` | `token-operation` | `token-parse-dn` | `token-password` | `token-removed-attr` | `token-removed-entitlement` | `token-replace-all` | `token-replace-first` | `token-resolve` | `token-src-attr` | `token-src-dn` | `token-src-name` | `token-substring` | `token-text` | `token-time` | `token-unique-name` | `token-unmatched-src-dn` | `token-upper-case` | `token-xml-parse` | `token-xml-serialize` | `token-xpath` ) +

## Parent Elements

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-association</code> | Association argument. |
| <code>arg-component</code>   | Component argument.   |
| <code>arg-dn</code>          | DN argument.          |

| Element                  | Description  |
|--------------------------|--|
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-replace-first

Expands to a version of the expansion of the concatenation of the enclosed tokens where the first matching instance of the regular expression specified by `regex` is replaced by the string specified by `replace-with`.

## Remarks

See <http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Pattern.html> and [http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll\(java.lang.String\)](http://java.sun.com/j2se/1.4/docs/api/java/util/regex/Matcher.html#replaceAll(java.lang.String))

The pattern options `CASE_INSENSITIVE`, `DOTALL`, and `UNICODE_CASE` are used but can be reversed using the appropriate embedded escapes.

## Example

```
<!-- change Full Name for "Surname, Given-Names" to "Given-Names Surname" -->
<token-replace-first regex="^(.*), (.*)$" replace-with="$2 $1">
  <token-attr name="Full Name"/>
</token-replace-first>
```

## Allowed Content

| Element                              | Description   |
|--------------------------------------|---|
| <code>token-added-entitlement</code> | The values of an entitlement granted in the current operation.                                  |
| <code>token-association</code>       | The association value from the current operation.   |
| <code>token-attr</code>              | The values of an attribute in the current operation or current object in the source data store. |
| <code>token-base64-decode</code>     | Decodes base64 data into a string.  |
| <code>token-base64-encode</code>     | Encodes a string into base64 data.  |
| <code>token-char</code>              | A Unicode character.  |
| <code>token-class-name</code>        | The object class name from the current operation  |
| <code>token-convert-time</code>      | Converts a date/time from one format to another.  |
| <code>token-dest-attr</code>         | The values of an attribute of current object in the destination data store.                     |
| <code>token-dest-dn</code>           | A value derived from the destination DN from the current operation.                             |
| <code>token-dest-name</code>         | The unqualified RDN derived from the destination DN from the current operation.                 |
| <code>token-document</code>          | Reads an XML document.  |
| <code>token-entitlement</code>       | The values of a granted entitlement of the current object.                                      |

| Element                   | Description  |
|---------------------------|--|
| token-escape-for-dest-dn  | Converts a string for use in a destination DN.                             |
| token-escape-for-src-dn   | Converts a string for use in a source DN.                                  |
| token-generate-password   | Generates a random password.   |
| token-global-variable     | The value of a global variable.  |
| token-join                | Joins a node-set into a string.  |
| token-local-variable      | The value of a local variable.   |
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |

| Element                             | Description  |
|-------------------------------------|--|
| <code>token-unmatched-src-dn</code> | A DN relative to the one matched by <code>if-src-dn</code> . |
| <code>token-upper-case</code>       | Converts a string to uppercase.                              |
| <code>token-xml-parse</code>        | Parses XML.  |
| <code>token-xml-serialize</code>    | Serializes XML.  |
| <code>token-xpath</code>            | The result of an XPath expression.                           |

## Attributes

| Attribute                 | Possible Values   | Default Value |
|---------------------------|---|---------------|
| <code>notrace</code>      | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |
| <code>regex</code>        | CDATA<br><br>Regular expression that matches the substring to replace.                        | #REQUIRED     |
| <code>replace-with</code> | CDATA<br><br>Regular expression that specifies the replacement string.                        | #REQUIRED     |

## Content Rule

( `token-added-entitlement` | `token-association` | `token-attr` | `token-base64-decode` | `token-base64-encode` | `token-char` | `token-class-name` | `token-convert-time` | `token-dest-attr` | `token-dest-dn` | `token-dest-name` | `token-document` | `token-entitlement` | `token-escape-for-dest-dn` | `token-escape-for-src-dn` | `token-generate-password` | `token-global-variable` | `token-join` | `token-local-variable` | `token-lower-case` | `token-named-password` | `token-map` | `token-op-attr` | `token-op-property` | `token-operation` | `token-parse-dn` | `token-password` | `token-removed-attr` | `token-removed-entitlement` | `token-replace-all` | `token-replace-first` | `token-resolve` | `token-src-attr` | `token-src-dn` | `token-src-name` | `token-substring` | `token-text` | `token-time` | `token-unique-name` | `token-unmatched-src-dn` | `token-upper-case` | `token-xml-parse` | `token-xml-serialize` | `token-xpath` ) +

## Parent Elements

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-association</code> | Association argument. |
| <code>arg-component</code>   | Component argument.   |
| <code>arg-dn</code>          | DN argument.          |

| Element                  | Description  |
|--------------------------|--|
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



# token-resolve

<token-split> resolved the DN specified by <arg-dn> to an association key, or the association key specified by <arg-association> to a DN in the data store specified by data store.

## Example

```
<token-resolve datastore="src">
  <arg-dn>
    <token-op-attr name="manager"/>
  </arg-dn>
</token-resolve>
```

## Allowed Content

| Element         | Description           |
|-----------------|-----------------------|
| arg-association | Association argument. |
| arg-dn          | DN argument.          |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| datastore | src   dest<br>The data store to be queried.   | dest          |
| notrace   | true   false<br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( arg-dn | arg-association )

## Parent Elements

| Element         | Description           |
|-----------------|-----------------------|
| arg-association | Association argument. |
| arg-component   | Component argument.   |
| arg-dn          | DN argument.          |
| arg-node-set    | Node set argument.    |

| Element                  | Description  |
|--------------------------|--|
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-split

Splits the result of the enclosed tokens into a node set consisting of text nodes based on the pattern specified by the delimiter. If csv is true, then CSV quoting rules will be honored during the parsing of the string.

## Example

```
<token-split delimiter=", " csv="true">
  <token-text>Doe,John,"Doe, John"</token-text>
</token-join>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |

| Element                   | Description  |
|---------------------------|--|
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| csv       | true   false<br><br>Honor CSV style quoting.  | false         |
| delimiter | CDATA<br><br>Regular expression that matches the delimiter characters. Supports variable expansion. | #REQUIRED     |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.       | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element             | Description  |
|---------------------|--|
| arg-association     | Association argument.                                  |
| arg-component       | Component argument.                                    |
| arg-dn              | DN argument.   |
| arg-node-set        | Node set argument.                                     |
| arg-password        | Password argument.                                     |
| arg-string          | String argument.                                       |
| arg-value           | Value argument.  |
| token-base64-decode | Decode base64 data into a string.                      |
| token-base64-encode | Encode a string into base64 data.                      |
| token-convert-time  | Convert a data/time from one format to another format. |

| Element                  | Description  |
|--------------------------|--|
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-src-attr

Expands to the attribute values of the current object in the source data store. If its parent element is **<arg-node-set>**, then all the available **<value>** elements are returned as nodes in a node set. Otherwise, the first available value is returned as a string.

## Example

```
<token-src-attr name="OU"/>
```

## Allowed Content

| Element         | Description           |
|-----------------|-----------------------|
| arg-association | Association argument. |
| arg-dn          | DN argument.          |

## Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| class-name | CDATA<br><br>Class name of the object to read.<br><br>Can be required (for schema mapping purposes) if the object is other than the current object. | #IMPLIED      |
| name       | CDATA<br><br>Name of the attribute.   | #REQUIRED     |
| notrace    | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |

## Content Rule

( arg-dn | arg-association ) ?

## Parent Elements

| Element         | Description           |
|-----------------|-----------------------|
| arg-association | Association argument. |

| Element                  | Description  |
|--------------------------|--|
| arg-component            | Component argument.  |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



## token-src-dn

Expands to the source DN specified in the current operation or a portion thereof. If start and length are not specified or are set to the default values {0,-1}, then the entire DN is used; otherwise, only the portion of the DN specified by start and length is used. The format of the DN is converted to the format of the destination data store if the convert attribute is set to true.

### Example

```
<token-src-dn/>
```

### Allowed Content

EMPTY

### Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| convert   | true   false<br><br>Convert to the DN format of the destination data store.  | false         |
| length    | CDATA<br><br>The number of DN segments to include negative numbers are interpreted as (total # of segments + length) + 1. For example, for a DN with 5 segments a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc. | -1            |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.  | false         |
| start     | CDATA<br><br>The segment index to start with: 0 is the rootmost segment. >0 is an offset from the rootmost segment. -1 is the leafmost segment. <-1 is an offset from the leafmost segment towards the rootmost segment.           | 0             |

### Content Declaration

Empty

## Parent Elements

| Element                               | Description  |
|---------------------------------------|--|
| <code>arg-association</code>          | Association argument.                                      |
| <code>arg-component</code>            | Component argument.  |
| <code>arg-dn</code>                   | DN argument.   |
| <code>arg-node-set</code>             | Node set argument.   |
| <code>arg-password</code>             | Password argument.   |
| <code>arg-string</code>               | String argument.   |
| <code>arg-value</code>                | Value argument.  |
| <code>token-base64-decode</code>      | Decode base64 data into a string.                          |
| <code>token-base64-encode</code>      | Encode a string into base64 data.                          |
| <code>token-convert-time</code>       | Convert a data/time from one format to another format.     |
| <code>token-escape-for-dest-dn</code> | Convert a string for use in the destination DN.            |
| <code>token-escape-for-src-dn</code>  | Convert a string for use in a source DN.                   |
| <code>token-join</code>               | Join a node set into a string.                             |
| <code>token-lower-case</code>         | Convert a string to lowercase.                             |
| <code>token-map</code>                | Map a string through a mapping table.                      |
| <code>token-parse-dn</code>           | Parses or converts a DN.                                   |
| <code>token-replace-all</code>        | Replaces all instances of a substring with a string.       |
| <code>token-replace-first</code>      | Replaces a single instance of a substring within a string. |
| <code>token-split</code>              | Splits a string into a node set.                           |
| <code>token-substring</code>          | Substring of a string.                                     |
| <code>token-upper-case</code>         | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>          | Parses XML.  |
| <code>token-xml-serialize</code>      | Serializes XML.  |

# token-src-name

Expands to the unqualified RDN of the source DN specified in the current operation.

## Example

```
<token-src-name/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument.                                       |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                      |
| token-base64-encode      | Encode a string into base64 data.                      |
| token-convert-time       | Convert a data/time from one format to another format. |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.        |

| Element                 | Description  |
|-------------------------|--|
| token-escape-for-src-dn | Convert a string for use in a source DN.                   |
| token-join              | Join a node set into a string.                             |
| token-lower-case        | Convert a string to lowercase.                             |
| token-map               | Map a string through a mapping table.                      |
| token-parse-dn          | Parses or converts a DN.                                   |
| token-replace-all       | Replaces all instances of a substring with a string.       |
| token-replace-first     | Replaces a single instance of a substring within a string. |
| token-split             | Splits a string into a node set.                           |
| token-substring         | Substring of a string.                                     |
| token-upper-case        | Converts a string to uppercase.                            |
| token-xml-parse         | Parses XML.  |
| token-xml-serialize     | Serializes XML.  |

# token-substring

Expands to a substring of the expansion of the concatenation of the enclosed tokens.

## Example

```
<token-substring start="0" length="1">  
  <token-attr name="Given Name"/>  
</token-substring>
```

## Allowed Content

| Element                                  | Description   |
|--|---|
| <a href="#">token-added-entitlement</a>  | The values of an entitlement granted in the current operation.                                  |
| <a href="#">token-association</a>        | The association value from the current operation.   |
| <a href="#">token-attr</a>               | The values of an attribute in the current operation or current object in the source data store. |
| <a href="#">token-base64-decode</a>      | Decodes base64 data into a string.  |
| <a href="#">token-base64-encode</a>      | Encodes a string into base64 data.  |
| <a href="#">token-char</a>               | A Unicode character.  |
| <a href="#">token-class-name</a>         | The object class name from the current operation  |
| <a href="#">token-convert-time</a>       | Converts a date/time from one format to another.  |
| <a href="#">token-dest-attr</a>          | The values of an attribute of current object in the destination data store.                     |
| <a href="#">token-dest-dn</a>            | A value derived from the destination DN from the current operation.                             |
| <a href="#">token-dest-name</a>          | The unqualified RDN derived from the destination DN from the current operation.                 |
| <a href="#">token-document</a>           | Reads an XML document.  |
| <a href="#">token-entitlement</a>        | The values of a granted entitlement of the current object.                                      |
| <a href="#">token-escape-for-dest-dn</a> | Converts a string for use in a destination DN.  |
| <a href="#">token-escape-for-src-dn</a>  | Converts a string for use in a source DN.   |
| <a href="#">token-generate-password</a>  | Generates a random password.  |
| <a href="#">token-global-variable</a>    | The value of a global variable.   |
| <a href="#">token-join</a>               | Joins a node-set into a string.   |
| <a href="#">token-local-variable</a>     | The value of a local variable.  |
| <a href="#">token-lower-case</a>         | Converts a string to lowercase.   |

| Element                   | Description  |
|---------------------------|--|
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| length    | CDATA<br><br>The number of characters to include negative numbers are interpreted as (total # of characters + length) + 1. For example, for a string with 5 characters a length of -1 = (5 + (-1)) + 1 = 5, -2 = (5 + (-2)) + 1 = 4, etc. | -1            |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| start     | CDATA<br><br>The character index to start with: 0 is the first character. >0 is an offset from the start if the string. -1 is the last character.<-1 is an offset from the last character towards the start of the string of the string.  | 0             |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element         | Description           |
|-----------------|-----------------------|
| arg-association | Association argument. |
| arg-component   | Component argument.   |
| arg-dn          | DN argument.          |
| arg-node-set    | Node set argument.    |

| Element                  | Description  |
|--------------------------|--|
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



# token-text

Expands to the enclosed text.

## Example

```
<token-text>Fred</token-text>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( #PCDATA )

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument.                                       |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                      |
| token-base64-encode      | Encode a string into base64 data.                      |
| token-convert-time       | Convert a data/time from one format to another format. |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.        |

| Element                 | Description  |
|-------------------------|--|
| token-escape-for-src-dn | Convert a string for use in a source DN.                   |
| token-join              | Join a node set into a string.                             |
| token-lower-case        | Convert a string to lowercase.                             |
| token-map               | Map a string through a mapping table.                      |
| token-parse-dn          | Parses or converts a DN.                                   |
| token-replace-all       | Replaces all instances of a substring with a string.       |
| token-replace-first     | Replaces a single instance of a substring within a string. |
| token-split             | Splits a string into a node set.                           |
| token-substring         | Substring of a string.                                     |
| token-upper-case        | Converts a string to uppercase.                            |
| token-xml-parse         | Parses XML.  |
| token-xml-serialize     | Serializes XML.  |

# token-time

Expands to the current date/time in the format, language and time zone specified by format, language, and time zone. See “[Date/Time Parameters](#)” on page 365 for information on specifying formats, languages, and time zones.

## Example

```
<token-time src-format="!CTIME" tz="UTC"/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| format    | CDATA<br><br>The date/time format. Supports variable expansion.                                     | #REQUIRED     |
| lang      | CDATA<br><br>The language (defaults to the current system language). Supports variable expansion.   | #IMPLIED      |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy.       | false         |
| tz        | CDATA<br><br>The time zone (defaults to the current system time zone). Supports variable expansion. | #IMPLIED      |

## Content Declaration

Empty

## Parent Elements

| Element                         | Description           |
|---------------------------------|-----------------------|
| <a href="#">arg-association</a> | Association argument. |
| <a href="#">arg-component</a>   | Component argument.   |

| Element                  | Description  |
|--------------------------|--|
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-unique-name

Expands to a pattern based name that is unique in the destination data store according to the criteria specified.

## Remarks

Each <arg-string> element provides a pattern to be used to create a proposed name.

A proposed name is tested by performing a query for that value in the name attribute against the destination data store using the <arg-dn> element or the <arg-association> element as the base of the query and scope as the scope of the query. If the destination data store is the Identity Vault and name is omitted, then a search is performed against the pseudo-attribute "[Entry].rdn", which represents the RDN of an object without respect to what the naming attribute might be. If the destination data store is the application, then name is required.

A pattern can be tested with and/or without a counter as indicated by counter-use and counter-pattern. When a pattern is tested with a counter, the pattern is tested repeatedly with an appended counter until a name is found that does not return any instances or the counter is exhausted. The counter starting value is specified by counter-start and the counter maximum value is specified in terms of the maximum number of digits as specified by counter-digits. If the number of digits is less than those specified, then the counter is right padded with zeros unless the counter-pad attribute is set to false. The counter is considered exhausted when the counter can no longer be represented by the specified number of digits.

As soon as a proposed name is determined to be unique, the testing of names is stopped and the unique name is returned.

The order of proposed names is tested as follows:

- Each pattern is tested in the order specified. If counter-use="always" and the pattern is one of the patterns indicated by the counter-pattern then the pattern is tested with a counter, otherwise it is tested without a counter.
- If no unique name has been found after the patterns have been exhausted and counter-use="fallback", then the patterns indicated by the counter-pattern are retried with a counter.

If all specified combinations of patterns and counters are exhausted, then the action specified by the on-unavailable is taken.

## Example

```
<token-unique-name name="CN" scope="subtree"
  counter-start="1" counter-digits="2" counter-pad="true"
  counter-pattern="first" counter-use="fallback" on-unavailable="error">
  <arg-string>
    <token-upper-case>
      <token-substring start="0" length="1">
        <token-attr name="Given Name"/>
      </token-substring>
      <token-attr name="Surname"/>
    </token-upper-case>
  </arg-string>
  <arg-string>
```

```

    <token-upper-case>
      <token-substring start="0" length="1">
        <token-attr name="Given Name"/>
      </token-substring>
      <token-substring start="0" length="1">
        <token-attr name="MI"/>
      </token-substring>
      <token-attr name="Surname"/>
    </token-upper-case>
  </arg-string>
  <arg-string>
    <token-upper-case>
      <token-attr name="Given Name"/>
      <token-attr name="Surname"/>
    </token-upper-case>
  </arg-string>
</token-substring>

```

## Allowed Content

| Element                | Description           |
|------------------------|-----------------------|
| <b>arg-association</b> | Association argument. |
| <b>arg-dn</b>          | DN argument.          |
| <b>arg-string</b>      | String argument       |

## Attributes

| Attribute       | Possible Values  | Default Value |
|-----------------|--|---------------|
| counter-digits  | CDATA<br>Width in digits of counter.   | #IMPLIED      |
| counter-pad     | true   false<br>Enable/disable right zero padding of counter.  | true          |
| counter-pattern | first   last   all<br>Which patterns to use counter with:<br><br>First: Use counter only with the first pattern.<br><br>Last: Use counter only with the last pattern.<br><br>All: Use counter with all patterns. | last          |
| counter-start   | CDATA<br>Number to start counter.  | 1             |

| Attribute      | Possible Values   | Default Value |
|----------------|---|---------------|
| counter-use    | always   never   fallback<br><br>When to use counters:<br><br>Never: Don't use counters.<br><br>Always: Always use counters on the patterns indicated by counter-pattern.<br><br>Fallback: Use counters counter the patterns indicated by counter-pattern only after all patterns have failed without counters.     | fallback      |
| name           | CDATA<br><br>Name of attribute to check for uniqueness.   | #IMPLIED      |
| notrace        | true   false<br><br>True if this element should not be traced during execution of the policy.   | false         |
| on-unavailable | ignore   warning   error   fatal<br><br>Action to take if unique name cannot be constructed:<br><br>Ignore: Ignore and return empty name.<br><br>Warning: Issue warning and return empty name.<br><br>Error: Generate error and abort current transaction.<br><br>Fatal: Generate fatal error and shut down driver. | error         |
| scope          | subordinates   subtree<br><br>The scope in which to check uniqueness.   | subtree       |

## Content Rule

(( arg-dn | arg-association ) ? , arg-string + )

## Parent Elements

| Element                         | Description           |
|---------------------------------|-----------------------|
| <a href="#">arg-association</a> | Association argument. |

| Element                  | Description  |
|--------------------------|--|
| arg-component            | Component argument.  |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.   |
| arg-password             | Password argument.   |
| arg-string               | String argument.   |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



# token-unmatched-src-dn

Expands to the portion of the source DN in the current operation that corresponds to the part of the DN that was not matched by the most recent match of an `<if-src-dn>` in the conditions for this rule (taking into account short circuit evaluation). If there were no matches, then the entire DN is used. The format of the DN is converted to the format of the destination data store if the convert attribute is set to true.

## Example

```
<token-unmatched-src-dn/>
```

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| convert   | true   false<br><br>Convert to the DN format of the destination data store.                   | false         |
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Declaration

Empty

## Parent Elements

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-association</code> | Association argument. |
| <code>arg-component</code>   | Component argument.   |
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-node-set</code>    | Node set argument.    |
| <code>arg-password</code>    | Password argument.    |
| <code>arg-string</code>      | String argument.      |
| <code>arg-value</code>       | Value argument.       |

| Element                  | Description  |
|--------------------------|--|
| token-base64-decode      | Decode base64 data into a string.                          |
| token-base64-encode      | Encode a string into base64 data.                          |
| token-convert-time       | Convert a data/time from one format to another format.     |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.            |
| token-escape-for-src-dn  | Convert a string for use in a source DN.                   |
| token-join               | Join a node set into a string.                             |
| token-lower-case         | Convert a string to lowercase.                             |
| token-map                | Map a string through a mapping table.                      |
| token-parse-dn           | Parses or converts a DN.                                   |
| token-replace-all        | Replaces all instances of a substring with a string.       |
| token-replace-first      | Replaces a single instance of a substring within a string. |
| token-split              | Splits a string into a node set.                           |
| token-substring          | Substring of a string.                                     |
| token-upper-case         | Converts a string to uppercase.                            |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |

# token-upper-case

Expands to a version of the expansion of the concatenation of the enclosed tokens with each character converted to uppercase.

## Example

```
<token-upper-case>  
  <token-attr name="Surname"/>  
</token-upper-case>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |

| Element                   | Description  |
|---------------------------|--|
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument.                                       |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                      |
| token-base64-encode      | Encode a string into base64 data.                      |
| token-convert-time       | Convert a data/time from one format to another format. |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.        |
| token-escape-for-src-dn  | Convert a string for use in a source DN.               |
| token-join               | Join a node set into a string.                         |
| token-lower-case         | Convert a string to lowercase.                         |
| token-map                | Map a string through a mapping table.                  |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring with a string.       |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

# token-xml-parse

Parses the result of the enclosed tokens as XML and returns the resulting document node in a node set. If the result of the enclosed tokens is not well-formed XML or cannot be parsed for any reason, an empty node set is returned.

## Example

```
<token-xml-parse>
  <token-base64-decode charset="UTF-8">
    <token-op-attr name="data"/>
  </token-base64-decode>
</token-xml-parse>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |

| Element                   | Description  |
|---------------------------|--|
| token-join                | Joins a node-set into a string.  |
| token-local-variable      | The value of a local variable.   |
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |



| Element                  | Description                        |
|--------------------------|------------------------------------|
| <code>token-xpath</code> | The result of an XPath expression. |

## Attributes

| Attribute            | Possible Values   | Default Value |
|----------------------|---|---------------|
| <code>notrace</code> | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( `token-added-entitlement` | `token-association` | `token-attr` | `token-base64-decode` | `token-base64-encode` | `token-char` | `token-class-name` | `token-convert-time` | `token-dest-attr` | `token-dest-dn` | `token-dest-name` | `token-document` | `token-entitlement` | `token-escape-for-dest-dn` | `token-escape-for-src-dn` | `token-generate-password` | `token-global-variable` | `token-join` | `token-local-variable` | `token-lower-case` | `token-named-password` | `token-map` | `token-op-attr` | `token-op-property` | `token-operation` | `token-parse-dn` | `token-password` | `token-removed-attr` | `token-removed-entitlement` | `token-replace-all` | `token-replace-first` | `token-resolve` | `token-src-attr` | `token-src-dn` | `token-src-name` | `token-substring` | `token-text` | `token-time` | `token-unique-name` | `token-unmatched-src-dn` | `token-upper-case` | `token-xml-parse` | `token-xml-serialize` | `token-xpath` ) +

## Parent Elements

| Element                               | Description  |
|---------------------------------------|--|
| <code>arg-association</code>          | Association argument.                                  |
| <code>arg-component</code>            | Component argument.                                    |
| <code>arg-dn</code>                   | DN argument.   |
| <code>arg-node-set</code>             | Node set argument.                                     |
| <code>arg-password</code>             | Password argument.                                     |
| <code>arg-string</code>               | String argument.                                       |
| <code>arg-value</code>                | Value argument.  |
| <code>token-base64-decode</code>      | Decode base64 data into a string.                      |
| <code>token-base64-encode</code>      | Encode a string into base64 data.                      |
| <code>token-convert-time</code>       | Convert a data/time from one format to another format. |
| <code>token-escape-for-dest-dn</code> | Convert a string for use in the destination DN.        |
| <code>token-escape-for-src-dn</code>  | Convert a string for use in a source DN.               |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-join</code>          | Join a node set into a string.                             |
| <code>token-lower-case</code>    | Convert a string to lowercase.                             |
| <code>token-map</code>           | Map a string through a mapping table.                      |
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring with a string.       |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

# token-xml-serialize

Serializes the node set result enclosed tokens as XML. Depending on the content of the node set, the resulting string is either a well-formed XML document or a well-formed parsed general entity. A parsed general entity cannot be parsed as a standalone XML document.

## Example

```
<token-xml-serialize>
  <token-xpath expression="."/>
</token-xml-serialize>
```

## Allowed Content

| Element                  | Description   |
|--------------------------|---|
| token-added-entitlement  | The values of an entitlement granted in the current operation.                                  |
| token-association        | The association value from the current operation.   |
| token-attr               | The values of an attribute in the current operation or current object in the source data store. |
| token-base64-decode      | Decodes base64 data into a string.  |
| token-base64-encode      | Encodes a string into base64 data.  |
| token-char               | A Unicode character.  |
| token-class-name         | The object class name from the current operation  |
| token-convert-time       | Converts a date/time from one format to another.  |
| token-dest-attr          | The values of an attribute of current object in the destination data store.                     |
| token-dest-dn            | A value derived from the destination DN from the current operation.                             |
| token-dest-name          | The unqualified RDN derived from the destination DN from the current operation.                 |
| token-document           | Reads an XML document.  |
| token-entitlement        | The values of a granted entitlement of the current object.                                      |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.  |
| token-escape-for-src-dn  | Converts a string for use in a source DN.   |
| token-generate-password  | Generates a random password.  |
| token-global-variable    | The value of a global variable.   |
| token-join               | Joins a node-set into a string.   |
| token-local-variable     | The value of a local variable.  |

| Element                   | Description  |
|---------------------------|--|
| token-lower-case          | Converts a string to lowercase.  |
| token-map                 | Maps a string through a mapping table.                                     |
| token-named-password      | The value of the named password.   |
| token-op-attr             | The values of an attribute in the current operation.                       |
| token-op-property         | The value of an operation property.  |
| token-operation           | The name of the current operation.   |
| token-parse-dn            | Parses or converts a DN.   |
| token-password            | The value of the password in the current operation.                        |
| token-query               | Queries the source or destination data store.                              |
| token-removed-attr        | The values of an attribute removed in the current operation.               |
| token-removed-entitlement | The values of an entitlement revoked in the current operation.             |
| token-replace-all         | Replaces all instances of a substring within a string.                     |
| token-replace-first       | Replaces a single instance of a substring within a string.                 |
| token-resolve             | Resolves a DN to an association key or an association key to a DN.         |
| token-split               | Splits a string into a node set.   |
| token-src-attr            | The values of an attribute of the current object in the source data store. |
| token-src-dn              | A value derived from the source DN from the current operation.             |
| token-src-name            | The unqualified RDN derived from source DN from the current operation.     |
| token-substring           | Substring of a string.   |
| token-text                | Constant text.   |
| token-time                | The current date/time.   |
| token-unique-name         | Generates a unique name.   |
| token-unmatched-src-dn    | A DN relative to the one matched by <code>if-src-dn</code> .               |
| token-upper-case          | Converts a string to uppercase.  |
| token-xml-parse           | Parses XML.  |
| token-xml-serialize       | Serializes XML.  |
| token-xpath               | The result of an XPath expression.   |

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| notrace   | true   false<br><br>True if this element should not be traced during execution of the policy. | false         |

## Content Rule

( token-added-entitlement | token-association | token-attr | token-base64-decode | token-base64-encode | token-char | token-class-name | token-convert-time | token-dest-attr | token-dest-dn | token-dest-name | token-document | token-entitlement | token-escape-for-dest-dn | token-escape-for-src-dn | token-generate-password | token-global-variable | token-join | token-local-variable | token-lower-case | token-named-password | token-map | token-op-attr | token-op-property | token-operation | token-parse-dn | token-password | token-removed-attr | token-removed-entitlement | token-replace-all | token-replace-first | token-resolve | token-src-attr | token-src-dn | token-src-name | token-substring | token-text | token-time | token-unique-name | token-unmatched-src-dn | token-upper-case | token-xml-parse | token-xml-serialize | token-xpath ) +

## Parent Elements

| Element                  | Description  |
|--------------------------|--|
| arg-association          | Association argument.                                  |
| arg-component            | Component argument.                                    |
| arg-dn                   | DN argument.   |
| arg-node-set             | Node set argument.                                     |
| arg-password             | Password argument.                                     |
| arg-string               | String argument.                                       |
| arg-value                | Value argument.  |
| token-base64-decode      | Decode base64 data into a string.                      |
| token-base64-encode      | Encode a string into base64 data.                      |
| token-convert-time       | Convert a data/time from one format to another format. |
| token-escape-for-dest-dn | Convert a string for use in the destination DN.        |
| token-escape-for-src-dn  | Convert a string for use in a source DN.               |
| token-join               | Join a node set into a string.                         |
| token-lower-case         | Convert a string to lowercase.                         |
| token-map                | Map a string through a mapping table.                  |

| Element                          | Description  |
|----------------------------------|--|
| <code>token-parse-dn</code>      | Parses or converts a DN.                                   |
| <code>token-replace-all</code>   | Replaces all instances of a substring with a string.       |
| <code>token-replace-first</code> | Replaces a single instance of a substring within a string. |
| <code>token-split</code>         | Splits a string into a node set.                           |
| <code>token-substring</code>     | Substring of a string.                                     |
| <code>token-upper-case</code>    | Converts a string to uppercase.                            |
| <code>token-xml-parse</code>     | Parses XML.  |
| <code>token-xml-serialize</code> | Serializes XML.  |

## token-xpath

Expands to results of evaluating an XPath 1.0 expression. If its parent element is `<arg-node-set>` and the expression returns a node set, then the node set is returned as is. If its parent element is `<arg-node-set>` and the expression returns a data type other than node set, then a text node is containing the string value of the result is returned. Otherwise, the string value of the result is returned.

### Example

```
<token-xpath  
expression="*[@attr-name='OU']//value[starts-with(string(),'xxx')]" />
```

### Allowed Content

EMPTY

### Attributes

| Attribute  | Possible Values   | Default Value |
|------------|---|---------------|
| expression | CDATA<br>XPath expression.  | #REQUIRED     |
| notrace    | true   false<br>True if this element should not be traced during execution of the policy. | false         |

### Content Declaration

Empty

### Parent Elements

| Element                      | Description           |
|------------------------------|-----------------------|
| <code>arg-association</code> | Association argument. |
| <code>arg-component</code>   | Component argument.   |
| <code>arg-dn</code>          | DN argument.          |
| <code>arg-node-set</code>    | Node set argument.    |
| <code>arg-object</code>      | Java Object argument  |
| <code>arg-password</code>    | Password argument.    |
| <code>arg-string</code>      | String argument.      |

| Element                  | Description  |
|--------------------------|--|
| arg-value                | Value argument.  |
| token-base64-decode      | Decodes base64 data into a string.                       |
| token-base64-encode      | Encodes a string into base64 data.                       |
| token-convert-time       | Converts a date/time from one format to another.         |
| token-escape-for-dest-dn | Converts a string for use in a destination DN.           |
| token-escape-for-src-dn  | Converts a string for use in a source DN.                |
| token-join               | Joins a node set into a string.                          |
| token-lower-case         | Converts a string to lowercase.                          |
| token-map                | Maps a string through a mapping table.                   |
| token-parse-dn           | Parses or converts a DN.                                 |
| token-replace-all        | Replaces all instances of a substring within a string.   |
| token-replace-first      | Replaces a single instance of a substring with a string. |
| token-split              | Splits a string into a node set.                         |
| token-substring          | Substring of a string.                                   |
| token-upper-case         | Converts a string to uppercase.                          |
| token-xml-parse          | Parses XML.  |
| token-xml-serialize      | Serializes XML.  |



# DirXML Entitlements DTD

# 6

Conceptually, a DirXML entitlement is a named flag that causes an Identity Manager driver configuration to perform some arbitrary action that is usually related to granting access to some resource in a connected system. Entitlements (as embodied in Role-based Entitlements) have thus far been used for three basic actions:

- ♦ Creating and deleting or disabling a connected-system account.
- ♦ Adding/removing connected-system accounts group memberships.
- ♦ Adding/setting attribute values to connected-system accounts.

An entitlement is embodied in an eDirectory DirXML-Entitlement object, which is contained by a DirXML-Driver object. The containment of the DirXML-Entitlement object establishes the correspondence between the entitlement and the implementing Identity Manager driver configuration. The DirXML-Entitlement object's name is the name of the entitlement. The XmlData attribute of the DirXML-Entitlement object contains an XML document whose root element is `<entitlement>`.

An entitlement is granted to and revoked from an eDirectory object via the addition of the auxiliary class DirXML-EntitlementRecipient and the associated DirXML-EntitlementRef attribute to the eDirectory object. The DirXML-EntitlementRef attribute is of SYN\_PATH syntax and is “write-managed”. The “volume” (or DN) portion of the path syntax value refers to the DirXML-Entitlement object. Because the attribute is write-managed, the agent setting the DirXML-EntitlementRef attribute value on an eDirectory object must have write access to the DirXML-EntitlementRef attribute on the object that is being written to and must also have write access to the ACL attribute on the DirXML-Entitlement object that is referred to by the DN portion of the DirXML-EntitlementRef value. The “path” (or string) portion of the DirXML-EntitlementRef attribute contains an XML document whose root element is `<ref>`. The “namespace” (or integer) portion of the DirXML-EntitlementRef attribute is used as a bitmask to hold a set of flags. Bit 0 of the 32-bit integer is used for this flag value and is known as the state bit. 0 means revoked, 1 means granted. Bit 1 is used to flag a granted entitlement that is the result of the upgrade process and is known as the upgrade bit. 1 means that the entitlement was previously granted in the legacy format and is therefore not a change in the entitlement state. Bits 2-31 are reserved for future use.

After the entitlement action (grant or revocation) has been completed (successfully or not) by the Identity Manager driver configuration, a result is written to the eDirectory object using the DirXML-EntitlementResult attribute. DirXML-EntitlementResult is a multi-valued SYN\_OCTET\_STRING containing an XML document whose root element is `<result>`.

Since an entitlement is only a flag that signals an Identity Manager driver to grant some arbitrary resource, in order for the grant or revoke of an entitlement to actual have any effect, there must be policies on the driver that handle the actual granting or revoking of access to the resource in the connected application. DirXML Script contains explicit support for implementing entitlement policies. The `<if-entitlement>` condition is used to determine if a given entitlement has been granted or is changing. The `<token-entitlement>`, `<token-added-entitlement>`, and `<token-removed-entitlement>` tokens are used to get a list of the granted or revoked entitlements. The `<do-implement-entitlement>` action is used to mark policy actions that implement entitlements so that the results of the entitlement can be automatically logged to DirXML-EntitlementResult. The

entitlement tokens return a nodeset containing 0 or more `<entitlement-impl>` elements that can be used to get information about the entitlements and can be passed as an arguments to `<do-implement-entitlement>`.

See “DirXML Entitlements DTD Elements” on page 498 for a list of all of the elements in the DirXML Elements DTD.

## 6.1 DirXML Entitlements DTD Elements

| Element                        | Description   |
|--------------------------------|---|
| <code>description</code>       | Queries the result of the description.                |
| <code>display-name</code>      | Queries the result of the display name.               |
| <code>dn</code>                | Entitlement object DN.                                |
| <code>ent-value</code>         | Queries the result value.                             |
| <code>entitlement</code>       | Entitlement definition.                               |
| <code>entitlement-impl</code>  | Entitlement implementation marker.                    |
| <code>id</code>                | Entitlement granting agent correlation ID.            |
| <code>item</code>              | Cached entitlement query result item.                 |
| <code>item-description</code>  | Cached entitlement query result item description.     |
| <code>item-display-name</code> | Cached entitlement query result item display name.    |
| <code>item-value</code>        | Cached entitlement query result item value.           |
| <code>items</code>             | Cached entitlement query results.                     |
| <code>msg</code>               | Entitlement result status message.                    |
| <code>param</code>             | Entitlement parameter value.                          |
| <code>query-app</code>         | Query definition for legal values of the entitlement. |
| <code>query-xml</code>         | XDS query.  |
| <code>ref</code>               | Entitlement reference.                                |
| <code>result</code>            | Entitlement result.                                   |
| <code>result-set</code>        | Interpretation of query results.                      |
| <code>src</code>               | Entitlement granting agent type.                      |
| <code>state</code>             | Entitlement state.                                    |
| <code>status</code>            | Entitlement result status level.                      |
| <code>timestamp</code>         | Entitlement result time stamp.                        |
| <code>token-association</code> | Uses association value from the query result.         |
| <code>token-attr</code>        | Use attribute value from the query result.            |
| <code>token-src-dn</code>      | Use src-dn value from query result.                   |

| Element | Description                      |
|---------|----------------------------------|
| value   | Enumerated value.                |
| values  | Legal values of the entitlement. |

## description

Specifies how to obtain the description for each of the XDS instance element returned from an XDS query used to dynamically obtain a list of possible values from the connected application for the enclosing `<entitlement>`.

### Example

See `<entitlement>`.

### Allowed Content

| Element                        | Description                                  |
|--------------------------------|--|
| <code>token-association</code> | Use association value from the query result. |
| <code>token-src-dn</code>      | Use association value from the query result. |
| <code>token-attr</code>        | Use attribute value from the query result.   |

### Content Rule

( `token-association` | `token-src-dn` | `token-attr` )

### Parent Elements

| Element                 | Description                          |
|-------------------------|--------------------------------------|
| <code>result-set</code> | Interpretation of the query results. |

## display-name

Specifies how to obtain a display-name for each of the XDS instance element returned from an XDS query used to dynamically obtain a list of possible values from the connected application for the enclosing `<entitlement>`.

### Example

See `<entitlement>`.

### Allowed Content

| Element                        | Description                                  |
|--------------------------------|--|
| <code>token-association</code> | Use association value from the query result. |
| <code>token-src-dn</code>      | Use src-dn value from the query result.      |
| <code>token-attr</code>        | Use attribute value from the query result.   |

### Attributes

None

### Content Rule

( token-attr | token-src-dn | token-association )

### Parent Elements

| Element                 | Description                          |
|-------------------------|--------------------------------------|
| <code>result-set</code> | Interpretation of the query results. |

# dn

Contains the LDAP format DN of the DirXML-Entitlement object referenced by the enclosing `<result>`.

## Example

See `<result>`.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element                 | Description                          |
|-------------------------|--------------------------------------|
| <code>result-set</code> | Interpretation of the query results. |

## ent-value

Specifies how to obtain the actual parameter value for each of the XDS instance element returned from an XDS query used to dynamically obtain a list of possible values from the connected application for the enclosing `<entitlement>`.

### Example

See `<entitlement>`.

### Allowed Content

| Element                        | Description                                  |
|--------------------------------|--|
| <code>token-association</code> | Use association value from the query result. |
| <code>token-src-dn</code>      | Use src-dn value from the query result.      |
| <code>token-attr</code>        | Use attribute value from the query result.   |

### Attributes

None

### Content Rule

( `token-association` | `token-src-dn` | `token-attr` )

### Parent Elements

| Element                 | Description                          |
|-------------------------|--------------------------------------|
| <code>result-set</code> | Interpretation of the query results. |

# entitlement

An entitlement definition that is stored in the XmlData attribute of a DirXML-Entitlement object. The actual name of the entitlement comes from the RDN of the DirXML-Entitlement object. The entitlement definition defines a display name and description for the entitlement for use in UI agents, and can define whether or not an entitlement requires a single parameter value. If a parameter value is required, then it is possible to specify a list of possible values for that parameter value, or a query that can be issued to the associated application in order to get a list of possible parameters values.

## Example

```
<entitlement conflict-resolution="union" description="Recipient is entitled to an
account in the connected application" display-name="User Account"/>
```

```
<entitlement conflict-resolution="union"
  description="Groups that the recipient is entitled to belong to in the
connected application" display-name="Group Membership">
  <values>
    <query-app>
      <query-xml>
        <nds dtd-version="2.0">
          <input>
            <query class-name="Group" scope="subtree">
              <search-class class-name="Group"/>
              <read-attr attr-name="Description"/>
            </query>
          </input>
        </nds>
      </query-xml>
      <result-set>
        <display-name>
          <token-src-dn/>
        </display-name>
        <description>
          <token-attr attr-name="Description"/>
        </description>
        <ent-value>
          <token-association/>
        </ent-value>
      </result-set>
    </query-app>
  </values>
</entitlement>
```

```
<entitlement conflict-resolution="priority" description="The Musical Instrument
played by the recipient" display-name="Musical Instrument">
  <values multi-valued="false">
    <value>Trumpet</value>
    <value>Clarinet</value>
    <value>Trombone</value>
    <value>Flute</value>
    <value>Violin</value>
  </values>
</entitlement>
```



## Allowed Content

| Element | Description                      |
|---------|----------------------------------|
| values  | Legal values of the entitlement. |

## Attributes

| Attribute           | Possible Values   | Default Value |
|---------------------|---|---------------|
| conflict-resolution | priority   union<br><br>The conflict resolution method to be used by the Entitlements driver when the entitlement is used in conjunction with Role-based Entitlements and is granted via more than one role.<br><br>union: The parameter values of all the granting roles are granted to the recipient.<br><br>priority: Only the parameter values of the granting role with the highest priority are granted to the recipient. | priority      |
| description         | CDATA<br><br>The description for the entitlement that should be displayed by a UI agent.  | #REQUIRED     |
| display-name        | CDATA<br><br>The name for the entitlement that should be displayed by a UI agent.   | #REQUIRED     |

## Content Rule

( values ? )

## Parent Elements

None

# entitlement-impl

Represents a granted or revoked entitlement within DirXML Script.

## Example

```
<entitlement-impl id="xxx" src="AF" state="1" name="Group" src-  
dn="\MYTREE\Novell\Users\Fred" src-entry-id="65535">  
  cn=Managers,o=People  
</entitlement-impl>
```

## Allowed Content

#PCDATA

## Attributes

| Attribute    | Possible Values   | Default Value |
|--------------|---|---------------|
| id           | CDATA<br><br>The ID provided by the granting agent.                               | #IMPLIED      |
| name         | CDATA<br><br>Name of the entitlement.   | #REQUIRED     |
| src          | CDATA<br><br>The granting agent.  | #REQUIRED     |
| src-dn       | CDATA<br><br>The eDirectory™ DN of the entitlement recipient in slash format.     | #REQUIRED     |
| src-entry-id | CDATA<br><br>The eDirectory entry ID of the entitlement recipient in slash format | #IMPLIED      |
| state        | 0   1<br><br>The grant/revocation state<br><br>1 - granted<br><br>0 - revoked     | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

None

## id

An ID provided to a granted or revoked entitlement that is provided by the granting/revoking agent and is carried forward on the result of the granted/revoked entitlement. The meaning of the id is transparent to the entitlements system and is primarily intended to be used by the granting/revoking agent to correlate the entitlement results with the original grant or revocation.

### Example

See <ref>.

### Allowed Content

#PCDATA

### Attributes

None

### Content Rule

( #PCDATA )

### Parent Elements

| Element | Description            |
|---------|------------------------|
| ref     | Entitlement reference. |
| result  | Entitlement result.    |

# item

A cached query result item of a query used to dynamically discover the possible parameter values for an entitlement.

## Example

See `<items>`.

## Allowed Content

| Element                        | Description  |
|--------------------------------|--|
| <code>item-display-name</code> | Cached entitlement query result item display name. |
| <code>item-description</code>  | Cached entitlement query result item description.  |
| <code>item-value</code>        | Cached entitlement query result item value.        |

## Attributes

None

## Content Rule

( `item-display-name` ? , `item-description` ? , `item-value` )

## Parent Elements

| Element            | Description                       |
|--------------------|-----------------------------------|
| <code>items</code> | Cached entitlement query results. |

## item-description

The description of a cached query result item of a query used to dynamically discover the possible parameter values for an entitlement.

### Example

See <item>.

### Allowed Content

#PCDATA

### Attributes

None

### Content Rule

( #PCDATA )

### Parent Elements

| Element | Description                           |
|---------|---------------------------------------|
| item    | Cached entitlement query result item. |

# item-display-name

The display name of a cached query result item of a query used to dynamically discover the possible parameter values for an entitlement.

## Example

See <item>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description                           |
|---------|---------------------------------------|
| item    | Cached entitlement query result item. |

# item-value

The parameter value of a cached query result item of a query used to dynamically discover the possible parameter values for an entitlement.

## Example

See <items>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description                           |
|---------|---------------------------------------|
| item    | Cached entitlement query result item. |



# items

Holds the cached query result items of a query used to dynamically discover the possible parameter values for an entitlement. It is stored in the DirXML-SPCacheExternalQuery attribute of a DirXML-Entitlement object.

## Example

```
<items>
  <item>
    <item-display-name>cn=Managers,o=People</display-name>
    <item-description>Managers</description>
    <item-value>cn=Managers,o=People</value >
  </item>
  <item>
    <item-display-name>cn=Contractors,o=People</display-name>
    <item-description>Contractors</description>
    <item-value>cn=Contractors,o=People</value >
  </item>
</items>
```

## Allowed Content

| Element | Description                           |
|---------|---------------------------------------|
| item    | Cached entitlement query result item. |

## Attributes

None

## Content Rule

( item \* )

## Parent Elements

None

## msg

Contains the status message of the entitlement grant/revocation referenced by the enclosing `<result>`.

### Example

See `<result>`.

### Allowed Content

ANY

### Attributes

None

### Content Rule

ANY

### Parent Elements

| Element             | Description         |
|---------------------|---------------------|
| <code>result</code> | Entitlement result. |

# param

The parameter value of the entitlement as represented in a granted or revoked entitlement, and entitlement associated with a an RBE policy, or the result of granting/revoking an entitlement.

## Example

See <ref>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description            |
|---------|------------------------|
| ref     | Entitlement reference. |
| result  | Entitlement result.    |

## query-app

If present, a set of query-apps specifies an XDS query that can be used that can be used to dynamically obtain a list of possible values from the connected application for the enclosing **<entitlement>**. It also specifies how to obtain a display-name, description, and actual parameter value for each of the XDS instance elements returned from the query.

### Example

See **<entitlement>**.

### Allowed Content

| Element           | Description                     |
|-------------------|---------------------------------|
| <b>query-xml</b>  | XDS query                       |
| <b>result-set</b> | Interpretation of query results |

### Attributes

None

### Content Rule

( query-xml , result-set )

### Parent Elements

| Element       | Description                      |
|---------------|----------------------------------|
| <b>values</b> | Legal values of the entitlement. |

# query-xml

Specifies an XDS query that can be used that can be used to dynamically obtain a list of possible values from the connected application for the enclosing **<entitlement>**.

## Example

See **<entitlement>**.

## Allowed Content

ANY

## Attributes

None

## Content Rule

ANY

## Parent Elements

| Element          | Description   |
|------------------|---|
| <b>query-app</b> | Query definition for legal values of the entitlement. |

# ref

The value of the “path” (or string) portion of the DirXML-EntitlementRef attribute. When used on a DirXML-EntitlementRecipient it represents a granted or revoked entitlement and contains information about the granting/revoking agent as well as the parameter value if the entitlement requires one. When used on a DirXML-SharedProfile (that is, an RBE policy or role), it is only used to provide the parameter value that will be granted by the role.

## Example

```
<ref>
  <src>RBE</src>
  <id>{26dfb70f-0371-4fe2-a67f-bc101101e5d7}</id>
  <param>cn=Managers,o=People</param>
</ref>
```

## Allowed Content

| Element | Description                                |
|---------|--|
| src     | Entitlement granting agent type.           |
| id      | Entitlement granting agent correlation ID. |
| param   | Entitlement parameter value.               |

## Attributes

None

## Content Rule

( src ? , id ? , param ? )

## Parent Elements

None

# result

Written as a value of the DirXML-EntitlementResult attribute of a DirXML-EntitlementRecipient. It contains the results of granting or revoking an entitlement, as implemented by policy.

## Example

```
<result>
  <dn>cn=Group,cn=LDAP Driver,cn=DriverSet,o=
novell</dn>
  <src>RBE</src>
  <id>{26dfb70f-0371-4fe2-a67f-bc101101e5d7}</id>
  <param>cn=Managers,o=People</param>
  <state>l</state>
  <status>error</status>
  <msg>Access denied</msg>
  <timestamp>1112101901523</timestamp>
</result>
```

## Allowed Content

| Element   | Description                                |
|-----------|--|
| dn        | Entitlement object DN.                     |
| src       | Entitlement granting agent type.           |
| id        | Entitlement granting agent correlation ID. |
| param     | Entitlement parameter value.               |
| state     | Entitlement state.                         |
| status    | Entitlement result status level.           |
| msg       | Entitlement result status message.         |
| timestamp | Entitlement result time stamp.             |

## Attributes

None

## Content Rule

( dn , src , id ? , param ? , state , status , msg ? , timestamp )

## Parent Elements

None

# result-set

Specifies how to obtain a display-name, description, and actual parameter value for each of the XDS instance element returned from an XDS query used to dynamically obtain a list of possible values from the connected application for the enclosing <entitlement>.

## Example

See <entitlement>.

## Allowed Content

| Element      | Description                           |
|--------------|---------------------------------------|
| display-name | Query the result of the display name. |
| description  | Query the result of the description.  |
| ent-value    | Query the result value.               |

## Attributes

None

## Content Rule

( display-name , description , ent-value )

## Parent Elements

| Element   | Description   |
|-----------|---|
| query-app | Query the definition for legal values of the entitlement. |



## src

Used to identify the granting or revoking agent for an granted/revoked entitlement. Well know values are RBE when the agent is the Role Based Entitlements system, or AF when the granting agent is the Approval Flow system. Other agents that grant entitlements should provide their own unique identifier.

## Example

See <ref>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description            |
|---------|------------------------|
| ref     | Entitlement reference. |
| result  | Entitlement result.    |

## state

Contains the state (1=granted, 0=revoked) of the entitlement referenced by the enclosing `<result>`.

## Example

See `<result>`.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element             | Description         |
|---------------------|---------------------|
| <code>result</code> | Entitlement result. |

## status

Contains the status (success, error, warning, retry, fatal) of the entitlement grant/revocation referenced by the enclosing `<result>`.

### Example

See `<result>`.

### Allowed Content

#PCDATA

### Attributes

None

### Content Rule

( #PCDATA )

### Parent Elements

| Element             | Description        |
|---------------------|--------------------|
| <code>result</code> | Entitlement result |

# timestamp

Contains the time stamp of the entitlement grant/revocation referenced by the enclosing **<result>**. The time stamp is an integer that represents the number of milliseconds since midnight January 1, 1970.

## Example

See **<result>**.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element       | Description         |
|---------------|---------------------|
| <b>result</b> | Entitlement result. |

# token-association

Specifies that the value of the association key of the XDS instance element should be used as the value of the enclosing `<display-name>`, `<description>`, or `<ent-value>`.

## Example

See `<entitlement>`.

## Allowed Content

EMPTY

## Attributes

None

## Content Rule

Empty

## Parent Elements

| Element                   | Description                          |
|---------------------------|--------------------------------------|
| <code>description</code>  | Query the result of the description. |
| <code>display-name</code> | Query result display name.           |
| <code>ent-value</code>    | Query result value.                  |

# token-attr

Specifies that the first value of the named attribute from the XDS instance element should be used as the value of the enclosing <display-name>, <description>, or <ent-value>.

## Example

See <entitlement>.

## Allowed Content

EMPTY

## Attributes

| Attribute | Possible Values                 | Default Value |
|-----------|---------------------------------|---------------|
| attr-name | CDATA<br>Name of the attribute. | #REQUIRED     |

## Content Rule

( #PCDATA )

## Parent Elements

| Element      | Description                          |
|--------------|--------------------------------------|
| description  | Query the result of the description. |
| display-name | Query result display name.           |
| ent-value    | Query result value.                  |

# token-src-dn

Specifies that the value of the src-dn attribute of the XDS instance element should be used as the value of the enclosing <display-name>, <description>, or <ent-value>.

## Example

See <entitlement>.

## Allowed Content

EMPTY

## Attributes

None

## Content Declaration

Empty

## Parent Elements

| Element      | Description                          |
|--------------|--------------------------------------|
| description  | Query the result of the description. |
| display-name | Query result display name.           |
| ent-value    | Query result value.                  |

# value

If present, a set of <value> elements specifies a static list of possible values for the enclosing <entitlement>.

## Example

See <entitlement>.

## Allowed Content

#PCDATA

## Attributes

None

## Content Rule

( #PCDATA )

## Parent Elements

| Element | Description                      |
|---------|----------------------------------|
| values  | Legal values of the entitlement. |



## values

If present, <values> specifies that the enclosing <entitlement> requires a parameter value. If multi-valued="false" then the entitlement can only be granted to a given recipient with single value at a time, otherwise the entitlement can be granted to the same recipient more than once, each with a different value. <values> might also specify a list of possible values for the parameter value, or a query that can be issued to the associated application in order to get a list of possible parameters values.

## Example

See <entitlement>.

## Allowed Content

| Element   | Description   |
|-----------|---|
| query-app | Query definition for legal values of the entitlement. |
| value     | Enumerated value.                                     |

## Attributes

| Attribute    | Possible Values                    | Default Value |
|--------------|------------------------------------|---------------|
| multi-valued | True   False<br>Multi-valued flag. | True          |

## Content Rule

( query-app | value + ) ?

## Parent Elements

| Element     | Description             |
|-------------|-------------------------|
| entitlement | Entitlement definition. |



## 7

- ◆ Section 7.1, “Jobs XML,” on page 531
- ◆ Section 7.2, “Example Job XML,” on page 545

The XML that defines a job consists of two main parts: a `<job-definition>` section and zero or more `<xliiff>` sections that provide localized strings for the `<job-definition>`. The two parts are aggregated in order to ease storage on the job definition object. The Jobs DTD is as follows:

Jobs DTD 531

The Jobs XML makes use of the following elements:

- ♦ “audit” on page 533
- ♦ “bcc” on page 534
- ♦ “cc” on page 535
- ♦ “containment” on page 536
- ♦ “description” on page 537
- ♦ “email” on page 538
- ♦ “java-class” on page 539
- ♦ “job-aggregation” on page 540
- ♦ “job-definition” on page 541
- ♦ “reply-to” on page 542
- ♦ “result-processing” on page 543
- ♦ “to” on page 544
- ♦ “xliff” on page 545

# audit

Indicates that job result notification will be issued through the Novell Audit system.

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| on-level  | success   warning   error   aborted<br><br>Specifies the result level for which this audit notification applies. You can include an audit elements for each result level that you want to generate a notification. | #REQUIRED     |

## Parent Elements

result-processing

## **bcc**

Specifies a list of email addresses to place in the blind copy (*BCC*) field when sending a results notification email.

### **Attributes**

None

### **Parent Elements**

[email](#)

## **CC**

Specifies a list of email addresses to place in the carbon copy (*CC*) field when sending a results notification email.

## **Attributes**

None

## **Parent Elements**

**email**

## containment

Zero or more containment elements describe any restrictions to the eDirectory objects that can contain the `DirXML-Job` object representing the job. If no containment element appears then the `DirXML-Job` object may be contained by either a `DirXML-DriverSet` or `DirXML-Driver` object.

### Attributes

None

### Parent Elements

`job-definition`



## description

The description element contains a human-readable description of the job.

### Attributes

None

### Parent Elements

`job-definition`

# email

Indicates that job result notifications are issued via an email message. The email message is constructed from an email template specified by the `DirXML-EmailTemplates` attribute on the `DirXML-Job` object. The email recipients are specified in the email element's child elements: `to`, `cc`, and `bcc`. The email's reply-to address is specified by the email element's child `reply-to` element.

## Attributes

| Attribute | Possible Values  | Default Value |
|-----------|--|---------------|
| on-level  | success   warning   error   aborted<br><br>Specifies the result level for which this email notification applies. You can include an audit elements for each result level that you want to generate a notification. | #REQUIRED     |
| encoding  | CDATA<br><br>Specifies the encoding method to use with the email message.  | #IMPLIED      |

## Parent Elements

result-processing

## java-class

Contains the fully-qualified name of the java class that implements the job. There must be exactly one java-class element per job.

### Attributes

None

### Parent Elements

[job-definition](#)

## job-aggregation

Functions as the container object for a job and aggregates the job-definition information and any xliiff data used for language translation.

### Attributes

None

### Parent Elements

None

# job-definition

Contains XML attributes and elements which define much of the job.

## Attributes

| Attribute      | Possible Values  | Default Value |
|----------------|--|---------------|
| display-name   | CDATA<br><br>Specifies the job name displayed in the Job Scheduler UI.   | #REQUIRED     |
| type           | java<br><br>Specifies the language used to write the job. The only supported option is java.   | #REQUIRED     |
| schedule       | CDATA<br><br>Specifies the schedule used to run the job. This is configured in the Job Scheduler UI.   | #IMPLIED      |
| scope-required | true   false<br><br>Specifies if a job scope is necessary. The job scope defines the Identity Vault objects that the job works with, and is determined by the job developer. | False         |
| disabled       | true   false<br><br>Specifies, when true, that the job is not available to run.  | False         |
| auto-delete    | true   false<br><br>Indicates, when true, that the job is a one-time job that should be deleted after it runs.   | False         |

## Parent Elements

job-aggregation

## reply-to

Specifies a Reply To email address to place in the *From* field when sending a results notification email.

### Attributes

None

### Parent Elements

[email](#)

# result-processing

Describes how the job results (both intermediate and final) are reported. There can be zero or more result-processing elements. A result-processing element describes how notification of job results is made; and contains one or more audit or email elements. Each result-processing element applies to either "final" or "intermediate" results, based on the value of the element's type attribute.

## Attributes

| Attribute | Possible Values   | Default Value |
|-----------|---|---------------|
| type      | intermediate   final<br><br>Specifies whether the results-processing element applies to intermediate results that occur during job processing, or the final results when the job completes. | final         |

## Parent Elements

job-definition

## **to**

Specifies a list of email addresses to place in the *To* field when sending a results notification email.

### **Attributes**

None

### **Parent Elements**

**email**



# xliff

Provides localized strings for use by the job-definition object. The xliff format is an open standard. For more information about xliff, see the [XLIFF Web site \(http://www.oasis-open.org/committees/xliff\)](http://www.oasis-open.org/committees/xliff).

## Parent Elements

job-aggregation

## 7.2 Example Job XML

### Example 1

```
<job-aggregation>
<job-definition
  type="java"
  schedule="0 2 * * 1-5"
>
  <containment>DirXML-Driver</containment>
  <java-class>com.novell.nds.dirxml.jobs.builtin.PasswordGeneration</java-class>
  <configuration-values>
    <definitions>
      <definition
        type="dn-ref"
        name="password-policy"
        display-name="Password policy object"
        attr-name="DirXML-PasswordPolicyRef"
        aux-class-name="DirXML-PasswordGenAttrs"
      >
        <value/>
      </definition>
    </definitions>
  </configuration-values>
</job-definition>
</job-aggregation>
```

### Example 2

```
<job-aggregation>
<job-definition
  type="java"
  schedule="0 2 * * 1-5"
>
  <containment>DirXML-Driver</containment>
  <java-class>com.novell.nds.dirxml.jobs.builtin.SubSubmitter</java-class>
  <configuration-values>
    <definitions>
      <definition
        type="string"
        name="doc"
        display-name="Document to submit"
        multiline="true"
      >
        <value>
```

```
<nds>
  <input>
    <query scope="subtree">
      <association>{123456}</association>
      <search-class class-name="User"/>
      <read-attr/>
    </query>
  </input>
</nds>
</value>
</definition>
</definitions>
</configuration-values>
</job-definition>
</job-aggregation>
```