# Novell Security Manager Powered by Astaro

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USER GUIDE

August 31, 2005

Novell®

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Novell Security Manager Powered by Astaro User Guide
August 31, 2005

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# 1. Introduction to the Technology

Before exploring **Novell Security Manager powered by Astaro** security solution in detail, it may be helpful to take an overview of network and security technology in general. In particular, it is important to understand the serious risks that unprotected systems face as well as where and how to deploy this security manager to mitigate these risks.

### Networks

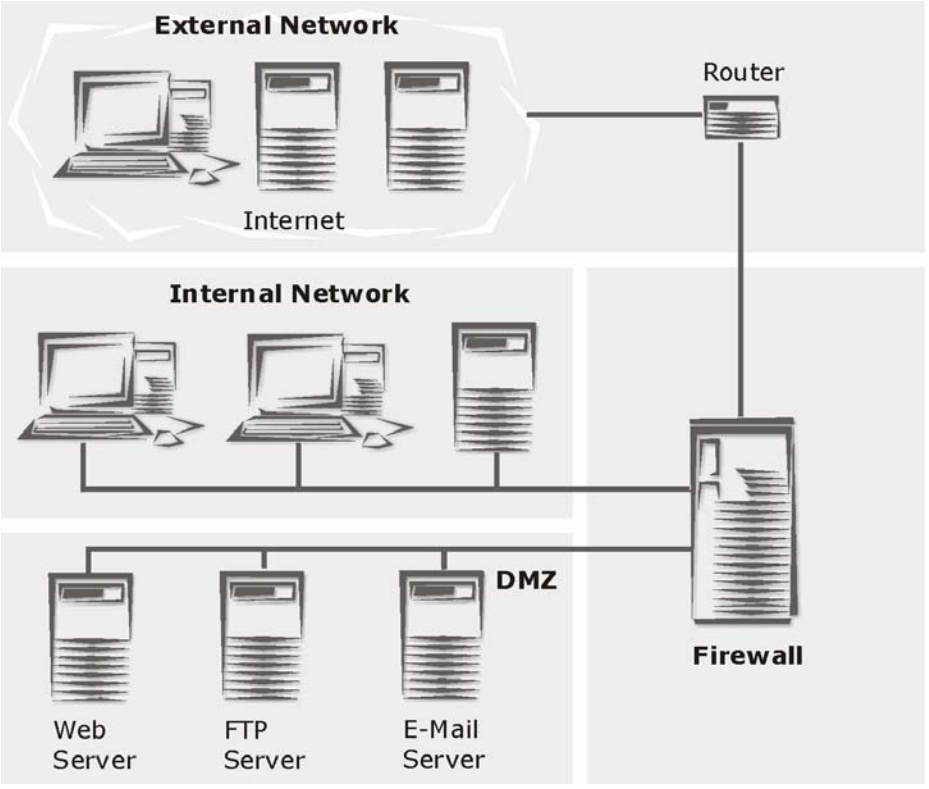
The Internet is already well established as a vital communications medium and a key marketplace for both traditional and new services. Since its inception, its size has multiplied, with domain name growth between 1995 and 2003 reaching almost exponential proportions.

Computers on this worldwide network communicate using the **Internet Protocol (IP)**, as well as various higher-level protocols such as TCP, UDP, and ICMP. IP addresses uniquely identify each of the computers reachable on the network.

The Internet itself is a collection of smaller networks of various kinds. When two or more networks are connected, a number of issues arise which are dealt with by devices such as routers, bridges, and gateways. A firewall is another such device, designed with security in mind.
As a rule, three kinds of network meet at the firewall:

- An external or Wide Area Network (WAN)
- An internal or Local Area Network (LAN)
- A De-Militarized Zone (DMZ)

An example configuration is shown on the next page.




#### The Firewall

One of the components in Novell Security Manager is a firewall. The characteristic tasks of a firewall connecting a WAN, LAN, and DMZ are:

- Protection against unauthorized access
- Access control
- Collection of audit trails
- Protocol analysis
- Reporting of security-related events
- Concealing internal network structure
- Separation of servers and clients using proxies
- Guaranteeing information confidentiality

A **firewall** combines several network components in order to provide these assurances. The following is a brief look at some of these tools and their uses.

#### Network-Layer Firewalls: Packet Filters

As the name suggests, this component filters IP packets on the basis of source and destination address, IP flags, and packet payload. This allows an administrator to grant or deny access to services based on factors such as:

- The source address
- The destination address
- The protocol (e.g., TCP, UDP, ICMP)
- The port number

The primary advantages of packet filters are their speed and their independence of operating systems and applications in use behind the firewall.

Advanced implementations of packet filters also inspect packets at higher network layers. Such filters interpret transport-level information (such as TCP and UDP headers) to analyze and record all current connections. This process is known as **stateful inspection**.

A stateful packet filter records the status of all connections, and allows only those packets associated with a current connection to pass. This is especially important for allowing connections from a protected network to an unprotected one, but disallowing connections in the opposite direction.

When a computer in the protected network establishes a connection with an external server, the stateful packet filter will allow the server's response packets in to the protected network. When the original connection is closed, however, the packet filter will block all further packets from the unprotected network (unless, of course, they have been explicitly allowed).

#### Application-Layer Gateways: Application Proxies

The second main kind of firewall is the application-layer gateway. These gateways act as a middleman in connections between external systems and protected ones. With such gateways, packets aren't forwarded so much as translated and rewritten, with the gateway performing the translation.

The translation process on the gateway is called a **proxy server**, or **proxy** for short. Because each proxy serves only one or a few well-defined application protocols, it is able to analyze and log protocol usage at a fine-grained level, and thereby offer a wide range of monitoring and security options.

The analysis can be especially intensive at the application level, because the application data transferred conforms to standardized protocols. The firewall knows about and can inspect every aspect of the data flow. This also means that small, manageable modules can be used for each kind of

data, which in turn means the system is less prone to problems due to implementation errors.

For example, Novell Security Manager includes the following proxies:

- An HTTP proxy with Java, JavaScript and ActiveX
- An SMTP proxy, which scans e-mails for viruses and controls e-mail distribution
- A SOCKS proxy which acts as a generic authenticating circuit-level proxy for many applications

Application-level gateways have the advantage of allowing the complete separation of protected and unprotected networks. They ensure that no packets are allowed to move directly from one network to the other. This results in reduced administration costs: as proxies ensure the integrity of protocol data, they can protect all of the clients and servers in your network, independent of brand, version, or platform.

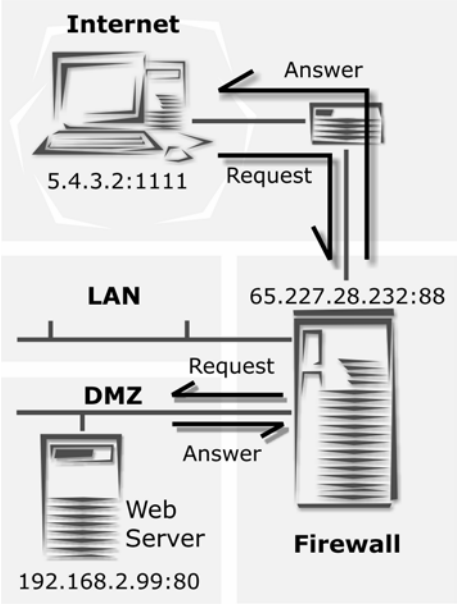
#### Protection Mechanisms

Some firewalls contain further mechanisms to ensure added security.

One such mechanism is supporting the use of private IP addresses in protected networks through **Network Address Translation (NAT)**, specifically …

- Masquerading
- Source NAT (SNAT)
- Destination NAT (DNAT)

This allows an entire network to hide behind one or a few IP addresses, and hides the internal network topology from the outside.




This allows internal machines to access Internet servers while making it is impossible to identify individual machines from the outside.

Using **Destination NAT**, it is nevertheless possible to make internal or DMZ servers available to the outside network for specific services.

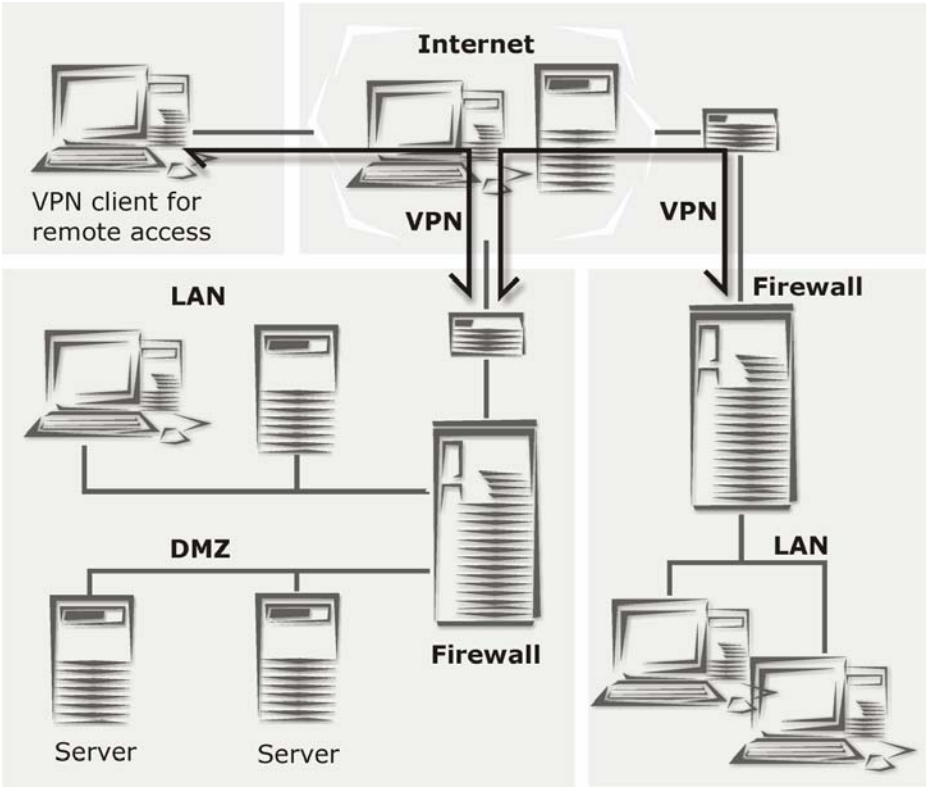
**Example**: An external user (see graphic on left) with the IP address 5.4.3.2 sends a request from port 1111 to the web server in the DMZ. The user knows only the external IP and port (65.227.28.232, port 88). Using **DNAT**, the firewall changes the destination address of the

request to the internal address of the web server (192.168.2.99, port 80), and sends it to the web server. The web server then responds, using its own internal IP address (192.168.2.99, Port 80), and sends the reply back to the user. The firewall recognizes the packet from the user's address and changes the source address of the reply from the web server's address to its own external address (65.227.28.232, port 88).

Another advanced protection mechanism is the VPN technology. To meet the demands of modern business, IT infrastructures must offer real-time communication and allow close cooperation between business partners, consultants, and branch offices. Increasingly, these demands are being met through the use of extranets, which usually operate either

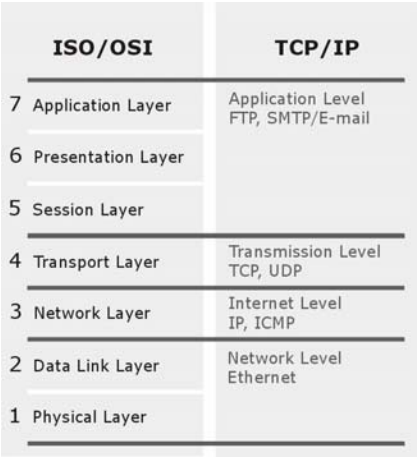
- via dedicated lines, or
- unencrypted over the Internet.

Each of these approaches has advantages and disadvantages which must be balanced according to cost and security requirements.




**Virtual Private Networks (VPN)** provide a cost-effective solution to this problem: they can connect LANs over the Internet using encrypted connections, thus enabling secure, transparent, end-to-end communication without the need for leased lines. This is especially useful when an organization has many branch offices connected to the Internet. IPSec technology provides a standard model for these secure connections.

These secure connections can be used automatically, independent of the data being transferred – this protects the data without requiring extra configuration or passwords on the client systems.




At the other end of the connection, the data is transparently decoded and forwarded to the recipient in its original form.

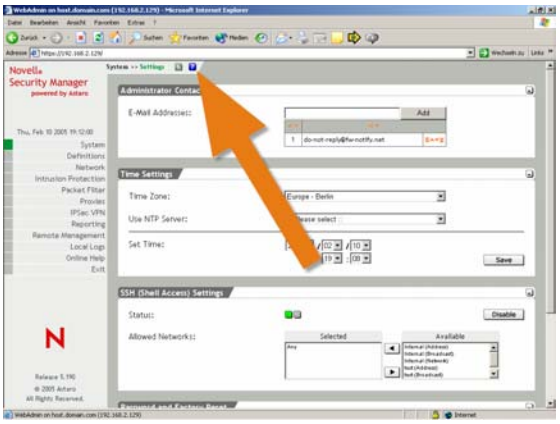
The **Firewall** component of Novell Security Manager is a hybrid of the preceding protection mechanisms, combining the advantages of each:

The **Stateful Inspection Packet Filter** offers the platform-independent flexibility to define, enable, and disable all necessary services. The **Proxies** incorporated into Novell Security Manager transform it into an **Application Gateway** capable of securing vital services such as **HTTP**, **Mail** and **DNS**. Further, the SOCKS proxy enables generic circuit-level proxying for all proxy-aware applications.

**VPN**, **SNAT**, **DNAT**, **Masquerading** and **static routing** capabilities make the firewall a powerful connection and control point on your network.

# 2. Installation

The installation of Novell Security Manager proceeds in two main steps: loading the software, and configuring the system parameters. The initial configuration required for loading the software is performed through the console-based **Installation Menu**, while the final configuration and customization can be performed from your management workstation through the web-based **WebAdmin** interface.




While configuring your system, please note that the **WebAdmin** system provides additional information and help through its **Online Help** system. To access this system, simply click the button marked **?**.

The following pages contain configuration worksheets where you can enter the data (such as default gateways and IP addresses) you use to set up your system. We recommend you fill these out as you configure the system, and that you keep the worksheets in a safe place for future reference.

**Attention:**

If you are upgrading your system from version 5 to version 6, and you wish to keep the settings from your existing installation, you must first upgrade your system to version 5.200 at least. Only backup files from this or higher versions of Astaro Security Linux can be loaded into Version 6. Further information on the Up2Date Service and the Backup function can be found in chapters 4.1.3 and 4.1.4.

## 2.1. System Requirements

The requirements for installing and using Novell Security Manager are:

#### Hardware

- Processor: Pentium II or compatible (up to 100 users)
- Processor: Pentium III or compatible (above 100 users)
- 256 MB RAM
- 8 GB IDE or SCSI hard drive
- Bootable IDE or SCSI CD-ROM drive
- 2 or more PCI Ethernet network cards
- For wireless LAN access: a wireless LAN PCMCIA card with the Prism2, Prism2,5 or Prism3 chipset (or compatible)

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**Important Note:**

The **High Availability (HA)**, **Wireless LAN**, and **Virtual LAN** subsystems require extra hardware. Please check the **Hardware Compatibility List for Novell Security Manager powered by Astaro**, available at **http://www.novell.com/documentation/nsma51** for compatibility.

To make Heart Beat monitoring of the **High Availability (HA)** system easier, we recommend using network cards from the *Hardware Compatibility List (HCL)* for all interfaces. The installation of the **HA** system is described in detail in chapter 4.1.10 on page 74.

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#### Administration PC

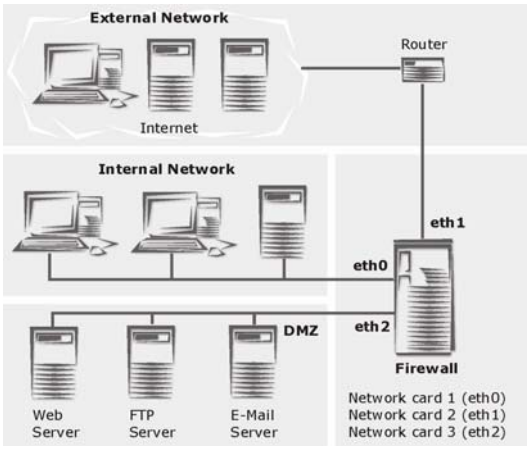
- Correct configuration of the **Default Gateway, IP Address**, and **Subnet Mask**
- An HTTPS-compliant browser (Microsoft Explorer 5.0 or newer, Netscape Communicator 6.1 or newer, or Mozilla 1.6+):

  **JavaScript** must be activated.

  The browser must be configured not to use a proxy for the IP address of the Security Manager's **internal network card (eth0)**.

  Browser configuration is discussed in chapter 4.6.1 on page 168.

### Example Configuration




As in the diagram on the left, Novell Security Manager should be the only link between the internal and external networks.

### Address Table

| | IP Address | Network Mask | Default Gateway |
|---|---|---|---|
| Internal network interface | ___.___.___.___ | ___.___.___.___ | ___.___.___.___ |
| External network interface | ___.___.___.___ | ___.___.___.___ | ___.___.___.___ |
| DMZ network interface [1)] | ___.___.___.___ | ___.___.___.___ | ___.___.___.___ |
| Network interface for the HA system [2)] | ___.___.___.___ | ___.___.___.___ | |

[1)] The third and further network cards are optional.

[2)] Network interface for the High Availability system.

## 2.2. Installation Instructions

What follows is a step-by-step guide to the installation process.

**Attention:**

The installation process will destroy all existing data on the hard disc!

#### Preparation

Before installation, please make sure you have the following items ready:

- Novell Security Manager CD-ROM
- the **license key** for Novell Security Manager
- the address table, with all **IP addresses**, **network masks** and **default gateway** filled in

### 2.2.1. Software Installation

The first part of the installation uses the Installation Menu to configure basic settings.

The setup program will check the hardware of the system, and then install the necessary software on your PC.

***1. Boot your PC from the CD-ROM Drive:***

Select the appropriate installation mode for your computer. Three pre-compiled kernel options are available for this purpose:

**Default**: Kernel for systems with a CPU.

**SMP**: Kernel for systems with several processors.

**Classic**: Kernel for systems with a CPU, in which the support for *APIC* (Advanced Programmable Interrupt Controller) and *ACPI* (Advanced Configuration and Power Interface) is disabled.

Since in older hardware components *APIC* and *ACPI* are often not supported, we recommend using the **Classic** Kernel in this case!

***2. Key Functions during the Installation (Step 1):***

In order to navigate through the menus, use the following keys. Please note the additional key functions listed in the green bar at the bottom of the screen.

**Cursor** keys: Use these keys to navigate through the text boxes (e.g., the license agreement or when selecting a keyboard layout).

**Enter** key: The entered information is confirmed, and the installation proceeds to the next step.

**ESC** key: Abort the installation.

**Tab** key: Move between text boxes, entry fields, and buttons.

Press **Enter** to continue.

**Attention:**

The installation will destroy all data on the PC!

Confirm the following security question by clicking the **F8** key.

3. ***Keyboard Layout (Step 2):***

   Use the **Cursor** keys to select your keyboard layout and press **Enter** to continue.

4. ***Hardware Detection (Step 3):***

   The software will check the following hardware requirements: CPU, size and type of hard drive, CD-ROM drive, network cards, and IDE or SCSI controllers.
   If your system does not meet the minimum requirements, the installation will report the error and abort.

5. ***Time and Date (Step 4):***

   Use the **Cursor** keys to select your country and press **Enter** to confirm.

   Use the **Cursor** keys to select your time zone and press **Enter** to continue.

   Next, enter the current time and date in the entry field. Use **Tab** and the **Cursor** keys to switch between entry fields. Invalid entries will be rejected.
   Confirm your entries with the **Enter** key.

6. ***Network Card Selection and Configuration (Step 5):***

   In order to use the **WebAdmin** tool to configure the rest of your Security Manager, you must now configure a card to be the **internal network card (eth0)**.

   Choose one of the available network cards from the list and confirm your selection with the **Enter** key.

   Next, define the **IP address**, **network mask**, and **default gateway** for this network card.

   **Example**:

   **Address**: 192.168.2.100

   **Netmask**: 255.255.255.0

   You must enter a value in the **Gateway** field if you wish to use the **WebAdmin** interface from a workstation outside the subnet defined by the netmask. Note that the gateway itself must be within the subnet.

For example, if you are using a network mask of 255.255.255.0, the subnet is defined by the first three values of the address: in this case, 192.168.2. If your administration computer is at, for example, 192.168.10.5, it is not on the same subnet, and thus requires a gateway to be configured here. The gateway router must have an interface on the 192.168.2 subnet, and must be able to contact the administration computer.

In our example, assume the gateway is at 192.168.2.1:

**Gateway**: 192.168.2.1

If the administration computer is on the same subnet as the internal network card (in our example, if its address is 192.168.2.x) it does not need a gateway. In this case, enter the following value here:

**Gateway**: none

Confirm your entries with the **Enter** key.

### 7. *License Agreement (Step 6):*

**Note:**

Please read the license agreement carefully.

Press **F8** to agree to the terms of the license.

### 8. *Final Notes (Step 7):*

**Attention:**

Please read the notes and warnings presented during the installation carefully. After confirming them, all existing data on the PC will be destroyed!

If you wish to change your entries, press **F12** to return to Step 1. Otherwise, start the installation process by pressing the **F8** key.

### 9. *Installing the Software (Step 8):*

The software installation process can take up to a couple of minutes. You can follow the progress of the installation using the four monitoring consoles:

There are four consoles available:

Main Installation (**Alt** + **F1**).

Interactive **bash** Shell 1 (**Alt** + **F2**).

Installation Log (**Alt** + **F3**).

Kernel Log (**Alt** + **F4**).

When the installation process completes, remove the CD-ROM from the drive and connect the **eth0** network card to the internal network.

Except for the **internal network card (eth0)**, the sequence of network cards normally will be determined by **PCI ID** and by the **Kernel** drivers.

The sequence of network card names may also change if the hardware configuration is changed, especially if network cards are removed or added.

***10. Reboot the System:***

Reboot the Security Manager by pressing **Ctrl** + **Alt** + **Del** or the **Reset** button.

During the boot process, the IP addresses of the internal network cards are changed. The **Install Routine** console (**Alt** + **F1**) may display the message `No IP on eth0` during this time.

After Novell Security Manager has rebooted (a process which, depending on hardware, can take up to five minutes), **ping** the IP Address of the **eth0** interface to ensure it is reachable.

If no connection is possible, please check for the following possible problems.

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**Error:**

Novell Security Manager is not reachable from the internal network.

**Possible Causes:**

- The IP address of Novell Security Manager is incorrect
- The IP address of the client computer is incorrect
- The default gateway on the client is incorrect
- The network cable is connected to the wrong network card
- All network cards are connected to the same hub

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**Note:**

If you connect to the Internet through a **DSL** connection, please read the installation instructions at **http://www.novell.com/documentation/nsma51**.

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### 2.2.2. Configuring Security Manager

The rest of the configuration will use the **WebAdmin** interface, accessed through a standard web browser (e.g., MS Internet Explorer) from your administration PC:

***1. Start your Browser and open WebAdmin:***

Before you can access the **WebAdmin** interface, you must make sure that your browser is configured correctly. Please see in chapter 4.6.1 on page 167 for more details.

Once your browser is correctly configured, start it and enter the management address of the Novell Security Manager (the internal IP address configured for eth0) as follows: **https://IP Address**.
(In the example from step 6 above, this would be https://192.168.2.100)

A **security notice** will appear. When you generate a certificate for **WebAdmin** in a later step, this notice will disappear.
Further information on generating and installing certificates can be found in chapter 4.1.9 on page 72.

For now, simply accept the **security notice** by clicking the **Yes** button.

The first time you start **WebAdmin**, two windows will open: the first contains the **License Agreement**, and the second is used for **Setting System Passwords**.

***2. Complete the License Agreement:***

In the **License Agreement** window, accept the terms of the license by clicking the **I agree to the terms of the license** selection box.

**Note:**

Please read the terms of the license carefully.

***3. Set the System Passwords:***

In the **Setting System Passwords** window, enter the passwords for Novell Security Manager.

**Security Note:**

Use a secure password! Your name spelled backwards is, for example, not a secure password – while something like xfT35$4 would be.

You will only be able to start **WebAdmin** once you have entered passwords for the functions listed below. Enter the password for each service, and then re-enter it in the text field labeled **Confirm**. The **usernames** are pre-defined, and cannot be changed.

**WebAdmin user**: access to WebAdmin
This user is called **admin**.

**Shell Login user**: access to SSH
This user is called **loginuser**.

**Shell Administrator user**: administrator privileges in the entire Security Manager.
This user is called **root**.

**Security Note:**

Use different passwords for the **Shell Login** and **Shell Administrator** users.

**Configuration Manager User (optional)**: You need this password, if you wish to configure Novell Security Manager with the *Configuration Manager*.

**Boot Manager (optional)**: If set, the password will prevent un-authorized users from changing boot-time parameters.

Confirm the entered passwords by clicking **Save**.

***4. Log in to WebAdmin:***

**User**: **admin**

**Password**: Password of the WebAdmin user

Please note that passwords are case-sensitive!

Click **Login**.

**Note:**

Please follow steps 5 through 16 in the order listed below.

***5. Uploading the License Key:***

In the **System** tab, open the **Licensing** menu and upload the **license key** under the **License File** window.

**Note:**

When using a license with the **High Availability (HA)** option, you must import the **License Key** to both Security Managers (Normal and Hot Standby mode).

For more information on **Licensing**, see chapter 4.1.2 on page 38.

***6. Configure Basic Settings:***

In the **System** tab, open the **Settings** menu and enter the following setting:

**Administrator E-Mail Addresses**: Enter the e-mail address of the administrator here.

You can find further information about these functions in chapter 4.1.1 on page 34.

In the **Network** tab, open the **Hostname/DynDNS** menu and enter the following settings in the **General System Settings** window:

**Hostname**: Enter the **Hostname** for Novell Security Manager.

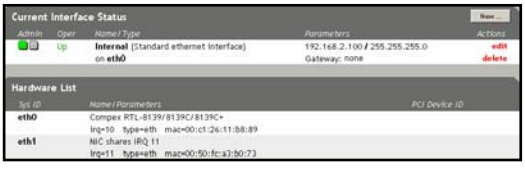
A domain name may contain alphanumeric characters, periods, and hyphens. The end of the name must be a valid top-level domain, such as "com", "de", or "org". The **Hostname** will be included in all **Notification E-Mails**.

Save the settings by clicking **Save**.

### *7. Configure the internal Network Interface (eth0):*

In the **Network** tab, open the **Interfaces** menu and check the settings for **eth0 network card**.

The settings for this network card are based on the information entered during the software installation. After starting Novell Security Manager, they are shown in the **Current Interface Status** window.



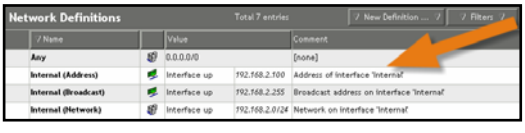

If you wish to change settings for this card, for example changing the configured name, please open the **Edit Interface** window by clicking the **edit** button and make these changes now.

**Attention:**

If you change the **IP address** of the **eth0** network card, you will be locked out of **WebAdmin**.

The configuration of network cards and virtual interfaces is described in chapter 4.3.2 on page 93.

### *8. Configure the internal Network:*




In the **Definitions** tab, open the **Networks** menu and check the settings for the internal network. Three logical networks were defined during installation based on your settings for the internal network card (eth0):

The interface **Internal (Interface)**, consisting of the defined IP address (example: 192.168.2.100) and the host network mask 255.255.255.255.

The broadcast network **Internal (Broadcast)**, consisting of the broadcast address (example: 192.168.2.255) and the host network mask 255.255.255.255.

The internal network **Internal (Network)**, consisting of the defined IP address (example: 192.168.2.0) and the defined network mask (example: 255.255.255.0).

Defining new **Networks** is described in chapter 4.2.1 on page 80.

***9. Configure the external Network Card:***

In the **Network** tab, open the **Interfaces** menu and configure the interface to be used to connect to the external network (Internet). The choice of interface and the required configuration depend on what kind of connection to the Internet you will be using.

The configuration of network cards and virtual interfaces is described in chapter 4.3.2 on page 93.

***10. Define Masquerading Rules:***

If you wish to use private IP addresses for your internal network and wish to connect directly (without proxies) to the Internet, you can now establish the relevant rules in the **Network/ NAT/Masquerading** menu.

More information about **DNAT**, **SNAT** and **Masquerading** can be found in chapter 4.3.5 on page 123.

IP routing entries for networks directly connected to Novell Security Manager's network cards (**Interface Routes**) will be added automatically.

If required, you can also define routing entries manually using the **Routing** menu. This will, however, usually only be necessary in complex network environments.

***11. Configure the DNS Proxy:***

In order to speed up name resolution, you can specify a local **DNS name server** (or one provided by your ISP) in the **Proxies/DNS** menu. Otherwise, Novell Security Manager will automatically use the **root name servers**.

If you wish to use the proxy, you should configure the **DNS Proxy** settings now.

More information about configuring the **DNS Proxy** can be found in chapter 4.6.4 on page 208.

***12. Connect other Networks:***

If you wish to connect other internal networks to Novell Security Manager, attach their cables now.

***13. Configure the HTTP Proxy:***

If computers on the internal network should use the HTTP proxy to connect to the Internet, open the **HTTP** menu in the **Proxies** tab and click **Enable**.

It might be necessary to configure the browsers to allow the computers in the internal network to access the Internet by using the HTTP proxy afterwards - e.g. if the proxy was configured for the standard operation mode.

The configuration of the **HTTP proxy** is described in more detail in chapter 4.6.1 on page 167.

***14. Configure the Packet Filter:***

In the **Rules** menu under the **Packet Filter** tab, you can establish packet filtering rules.

By default, all packets are filtered until you explicitly enable certain services. New rules are added to the bottom of the list, and are inactive until explicitly enabled. The rules are processed starting with the first and moving down the list, stopping at the first applicable rule. To activate a rule, click the status light once – the status light will turn green.

Please note that, because Novell Security Manager uses **Stateful Inspection**, only the connection-building packets need be specified. All response packets will automatically be recognized and accepted.

Configuring the **Packet Filter** is described in chapter 4.5 on page 152.

***15. Debug Packet Filter Rules:***

With the **Packet Filter Live Log** function In the **Packet Filter/ Advanced** menu, you can see which packets the packet filter is filtering. If you have problems after installing your Security Manager, this information can be helpful in **debugging** your filtering rules.

The **Packet Filter Live Log** function is described in chapter 4.5.3 on page 163.

***16. Install System and Virus Scanner Updates:***

You should download and install the latest **System Up2Dates** as soon as possible.

If you have a license for the **Virus Protection** option, you should also run the **Pattern Up2Date** system.

The **Up2Date Service** option is described in chapter 4.1.3 on page 40.

When you've completed these steps, the initial configuration of your Security Manager is complete. Click the **Exit** tab to leave **WebAdmin**.

#### Problems

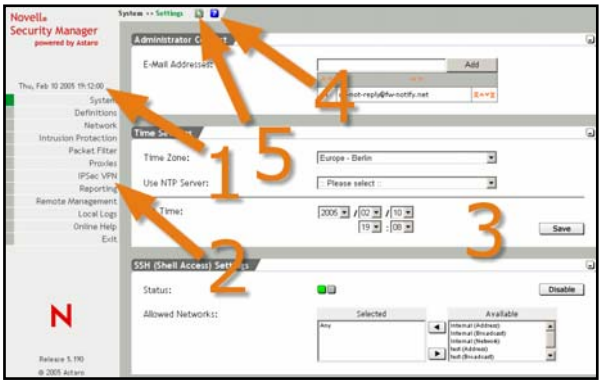
If you have problems completing these steps, please visit the **Novell Support Forum** at:

**http://support.novell.com/forums/2sm.html**

# 3. WebAdmin

The **WebAdmin** tool allows you to configure every aspect of Novell Security Manager. This chapter explains the tools and concepts used by **WebAdmin**, and shows how to use the built-in online help system.

**WebAdmin** has five main components:




(1) Info Box

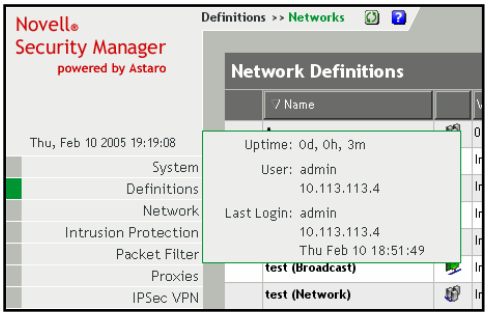
(2) Tabs

(3) Menus

(4) Online help

(5) Refresh

## 3.1. Info Box



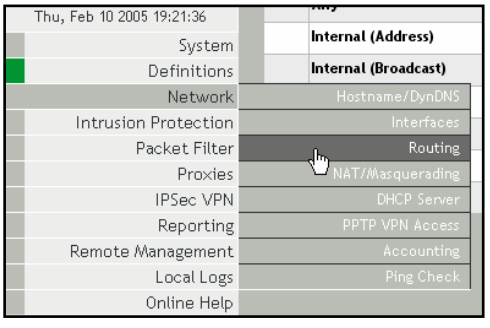

The system time and time zone are always displayed in the top left-hand corner of the screen. If you roll the mouse over the time display, the Info Box will appear, containing the following information:

**Uptime**: Displays how long Novell Security Manager has been running without a restart.

**User**: Displays which user is currently logged in to **WebAdmin**, as well as the client the user is logged in from.

**Last Login**: Displays when and from which client **WebAdmin** was last used.

## 3.2. Tab List




The Tab List on the left of the screen organizes the various menus according to subject. To list the menus contained under a subject heading, simply click the tab: the available menus will appear below. For ease of use, chapter 5, "Using Novell Security Manager", has been structured to

match the order of topics in the Tab List.

## 3.3. Menus

Every function of Novell Security Manager has its own separate menu in **WebAdmin**. This chapter describes the tools and displays used in the configuration menus.

### 3.3.1. The Status Light


Many features and subsystems of Novell Security Manager can be enabled or disabled while the system is running. A status light displays the current status of such subsystems:

- red = Function is disabled
- green = Function is enabled

For many features, the configuration options and tools will not be displayed until the status light is green.

### 3.3.2. Selection Field


With the **selection fields** the **allowed networks** and **allowed users** are assigned to the functions and services.

**Adding Objects to the Selected List**:

1. In the **Available** list, select the object (e.g., the network or user) you wish to add by clicking its name.

   You can select more than one object at a time by holding the **CTRL** key while you make your selection.

2. Click the **Left Arrow** button.

   The names you selected in the **Available** window will be moved to the **Selected** window.

**Removing Objects from the Selected List**:

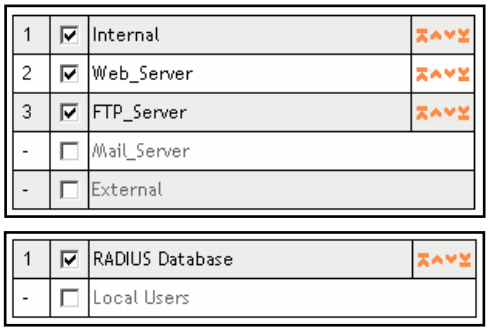
1. In the **Selected** list, choose the objects (networks or users) you wish to remove by clicking them.

   Again, you can select more than one object at a time by holding the **CTRL** key while you make your selection.

2. Click the **Right Arrow** button.

   The objects will be moved back to the **Available** window.

### 3.3.3. The Selection Table




Use the **selection table** to assign the corresponding **authentication method** or an **interface** to the functions and services.

The authentication method (Menu **System/User Authentication**) and the interfaces (Menu **Network/Interfaces**) must first be configured by the administrator. The picture above shows a selection table for interfaces. The picture below shows a table for the selection of authentications.

**The functions with the entries**:

The functions are only activated if the corresponding entry has been selected. The position of the entry is displayed in the left column. Use the buttons in the right column to change the order of the entries. Clicking on the buttons ^ or v moves the respective entry one line up and/or one line down.
Clicking on the buttons ⤒ or ⤓ moves the respective entry in the first and/or last line of the table.

**Assigning the authentication method or interface**:

Select the authentication method and/or interface by clicking on the check box.

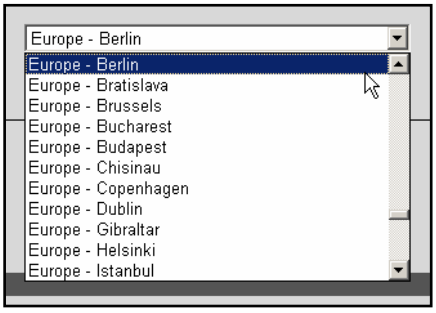
This activates the new setting and moves it into the last line of the already selected entries.

**Disabling an authentication method or interface**:

Disable an entry by clicking on the activated check box in the corresponding line.

The entry is immediately disabled. The functions in this line will then be no longer available.

### 3.3.4. Drop-down Menus

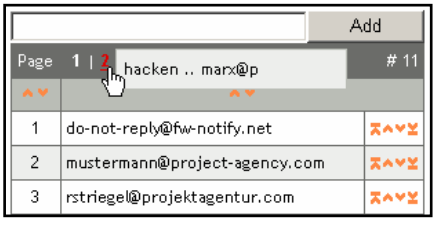



**Drop-down menus** are used to configure functions that can have only one of a few values. To use, simply select the value from the list: as a rule, values chosen in drop-down menus take effect immediately.

### 3.3.5. Lists


**Lists** are used, in contrast, to configure functions that not only allow more than one value to be configured, and where the listed objects do not need to be first defined by the administrator. In some instances, the order of the configured values is also relevant. Each list can contain many pages of values, and each page displays ten entries.

The **Interfaces** menu, for instance, uses a list to allow access to the **Wireless LAN Access Point**.




The first row of the table shows the number of pages in the list on the left (the current page is shown in white) and the total number of entries on the right (next to the # symbol). Note that, if you roll the mouse over one of the red page numbers, a tooltip appears showing the first and last entries on that page (see picture at right). This can help to navigate quickly between pages.

The second row contains tools to control the display of the list. Note that these do not change the configuration information, but rather the way in which these entries are displayed within **WebAdmin**. In cases where order is important, only the order indicated by the numbers next to entries has an effect on the configuration of the function. The buttons ⌃ and ⌄ in the left-hand column display the list in ascending and descending numerical order respectively, while the ⌃ and ⌄ buttons in the middle column display the list in ascending or descending alphabetical order.

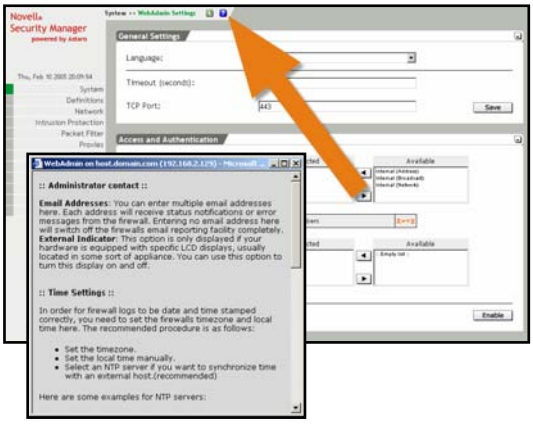
The functional order, as indicated by the numbers to the left of each entry, can be adjusted using the buttons in the right-hand column. A click on the ▲ or ▼ button in this column will move the entry one row up (i.e., towards 1) or down (towards the end of the list) respectively. Similarly, you can move an entry to the very beginning or end of the list by clicking the ⤒ or ⤓ buttons in this column, respectively.

**Add entry**: Type a value in the text-entry field and click **Add**.
The new value will appear in the last row of the table.

**Delete entry**: By double-clicking an entry, you can remove it from the list.

**Edit entry**: If you click an entry once, it will appear in the entry field. Edit the entry as desired and click the **Replace** button to put it back into the list.

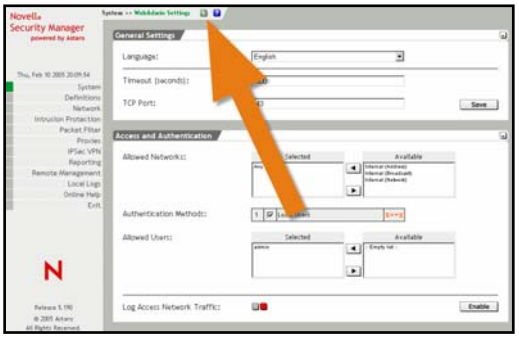
## 3.4. Online Help




Every menu in **WebAdmin** has an **Online Help** screen which provides a short explanation of the available configuration options.

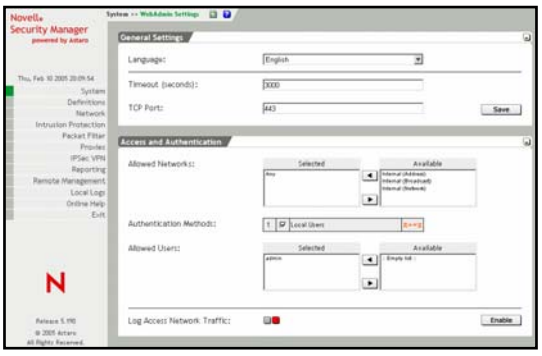
You can open the help screen by clicking the **?** button at the top right-hand corner of the screen.

## 3.5. Refresh




To load the menu again, click the **Refresh** button. Don't use the **Refresh** button of the tool bar of your browser to actualize the menu – otherwise you are logged-off the session and have to log in again under the **WebAdmin** configuration tool!

# 4. Using Novell Security Manager




We have already seen the web-based configuration tool **WebAdmin** in action during the installation process. This chapter will describe how to use **WebAdmin** to control and monitor your Security Manager on a day-to-day basis.

The specific settings, what they do, and how to change them will be described step-by-step. Please look to chapter 3 for a more general description of how to use the tools provided by the **WebAdmin** interface.

Please remember that the goal in configuring a Security Manager like this should be to enable only the features necessary for correct functionality. In general, you should restrict in- and outbound connections to those explicitly required.

**Tip:**

Draw up a plan of your network and determine which computer is to have access to which **services** before configuring Novell Security Manager. This will simplify the configuration process and save you a lot of time.

Configure the system as follows:

1. Define all the required networks and hosts.
2. Define the necessary services.
3. Define the system rules and proxies.

**Starting WebAdmin**:

1. Start your browser and enter the address of Novell Security Manager (i.e., the address of the eth0 interface) as follows:
   https://IP Address.

   In our example from step 6 of the installation instructions in chapter 2.2, this would be https://192.168.2.100.

   If you have not yet generated a **Certificate** for your **WebAdmin** site, a **Security notice** will appear.
   More information on how to install a certificate is available in chapter 4.1.9 on page 72.

2. Click the **Yes** button on the security notice to continue.

3. Log in to **WebAdmin**.


**User**: **admin**

**Password**: the password of the WebAdmin user.

   Both entries are case-sensitive!

4. Click **Login**.

   **Another administrator is already logged-in**:


If another administrator is already logged in to **WebAdmin**, a notice will appear on screen. The IP address shows you which computer the other administrator is using.

   The kick function allows you to end the other administrator's session.

   In the **Reason** field, type a reason for ending the other user's session and click **Login**.

You are now logged in, and can use the **WebAdmin** to manage the system.

## 4.1. Basic Settings (System)

The menus under the **System** tab allow you to configure and manage the basic settings of your Security Manager.

### 4.1.1. Settings

#### Administrator Contact


**E-Mail Addresses**: Whenever certain important events occur, such as portscans, failed logon attempts, or reboots, as well as whenever the self-monitor or Up2Date systems generate alerts or reboots, Novell Security Manager will send a notification e-mail to the administrator through the e-mail addresses entered into the ordered list. At least one e-mail address must be present; otherwise the **E-Mail Reporting** function will be disabled.
To add a new e-mail address, enter it in the entry field and click **Add**.

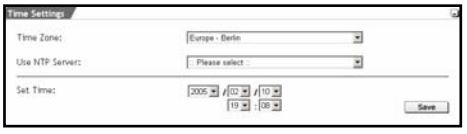
Please see chapter 3.3.5 on page 30 to learn more about the functions of the **ordered list**.

**Important Note:**

**Notification E-Mails** can only be sent to the administrator when the DNS Proxy is enabled and configured (chapter 4.6.4 on page 208), or when the **SMTP** menu (chapter 4.6.8 on page 214) has been configured with a route for incoming e-mails.

**Use external Indicators**: This option is only available on appliance systems with an attached LCD indicator. This option allows you to turn the LCD display on or off.

#### Time Settings




This menu can be used to set the time and date of Novell Security Manager. The date and time can be set manually with the help of the drop-down menu or can be automatically synchronized using the NTP server (Network Time Protocol). Please note that important changes in the time setting will appear as gaps in the **Reporting** and **Logging**.

**Important Note:**

We do not recommend changing the system time for daylight savings time. Instead, we recommend setting the system clock to Central European Time (CET). In summer, this corresponds to a deviation of less than one hour.

When system time settings are changed, the following "time warp" effects may be noticeable:

Moving forward (e.g., standard time to daylight saving time)

- The timeout for **WebAdmin** will expire and your session will no longer be valid.

  Time-based reports will have no data for the skipped hour. In most graphs, this time period will appear as a straight line in the amount of the old value.

- **Accounting** reports will contain values of 0 for all variables during this time.

Moving backward (e.g., daylight saving time to standard time)

- There are already log data for the corresponding span of time in the time-based reports that for system purposes come from the future: These data will not be overwritten.
- Log data will be written as normal when the time point before the reset is reached again.
- Most diagrams will display the values recorded during this period as compressed.
- **Accounting** reports will retain the values recorded from the "future". Once the time point of the reset is re-reached, the accounting files will be written again as normal.

Because of these difficulties, we recommend that the time be set only during the first configuration, and that only minor adjustments be made later. We recommend setting the system clock to Central European Time (CET). This is the original time. The system then runs always in CET, not in in CEST (Central European Summer Time). We recommend, not to change the time for summer, especially not when the collected reporting and accounting data are treated.

**Manual configuration of system time**:

1. Open the **Settings** menu in the **System** tab.
2. In the **Time Settings** window make the following settings in the given order:

   **Use NTP Server**: In order to configure the system clock manually, please ensure that No NTP Server is selected here. In this case, the **Please select** drop-down menu will be displayed.
   If a NTP Server is selected, select **No NTP Server** from the drop-down menu.

   **Time Zone**: Now select the time zone.

**Note:**

Changing the timezone will only change the current system time if you are using an NTP server to control time settings.

**Set Time**: Enter the current date and time here.

**Important Note:**

Take note of the issue date of your License Key. If this date is after the current date set on Novell Security Manager, the license will be deactivated.

The 30 day Evaluation License will not automatically activate.

5. Click the **Save** button to save these settings.

The time settings of Novell Security Manager will now be updated.

### Synchronizing system time with NTP Server

Before the system clock of Novell Security Manager can be synchronized with an external server, this server must be defined as **NTP Server**. The **NTP Server** will be defined as a network consisting of only one computer.

The definition of networks is covered in greater detail in chapter 4.2 on page 80. If the NTP server has already been defined, please begin with step 6.

1. Open the **Networks** menu in the **Definitions** tab.
2. In the **Name** entry field enter a distinct **Name**.
   Allowed characters are: Letters of the alphabet, digits from 0 to 9, hyphen, space, and underscore characters. The name must be fewer than 39 characters long.
3. Now enter the **IP Address** of the **NTP Server**.
4. In the **Subnet Mask** entry field, enter the **network mask** 255.255.255.255.
5. Now confirm your settings by clicking on the **Add** button.

   **WebAdmin** will now check your entries for semantic validity. Once accepted, the new network will appear in the network table.
6. Open the **Settings** menu in the **System** tab.
7. In the **Time Settings** window make the following settings in the given order:

   **Time Zone**: Now select the time zone.

   **Use NTP Server**: Select the NTP Server here.

The system clock of Novell Security Manager will be synchronized with the external NTP server every hour.

### SSH (Shell Access) Settings


**Secure Shell (SSH)** is a text-based access mode for Novell Security Manager intended only for advanced administrators. In order to access this shell, you will need an **SSH Client**, which comes standard with most Linux distributions. For MS Windows, we recommend **Putty** as SSH Client. Access through **SSH** is encrypted, and cannot be read by eavesdroppers.

The Shell Access function is enabled by default, once you have entered a password for the configuration through the **Configuration Manager** in the **Setting System Passwords** window.

If you wish to access Novell Security Manager through **SSH**, the SSH Status light must be enabled (status light shows green).
The **SSH** protocol uses **name resolution** (valid name server) if no valid name servers are found, SSH access attempts will time out. The time-out takes about a minute. During which time the connection seems to be frozen or failed. Once the time-out has expired, the connection process continues without further delay.

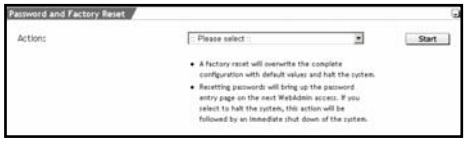
You must also add the networks allowed to access the **SSH** service in the **Allowed Networks** selection field. In order to ensure a seamless installation process, the **Allowed networks** field contains the **Any** option by default, this means that any computer can access the SSH service. Networks can be defined in the **Definitions/Networks** menu.

**Security Note:**

By default, anyone has access to the SSH service. The **Allowed Networks** field contains the **Any** option. For increased security, we recommend that access to the SSH service be limited. All other networks should be removed!

We recommend that the **SSH** service be disabled when not in active use.

### Password and Factory Reset




The **Password Reset** function allows you to set new passwords for Novell Security Manager. If you log in to the **WebAdmin** configuration

tool for the first time after this action, the **Setting System Passwords** window will be displayed. This allows you to set optional passwords, such as the *Configuration Manager* Password. **Halt System** will shut down Novell Security Manager. After the restart, the **Setting System Passwords** window will be displayed at first.

The **Factory Reset** function resets all configuration settings and options to their original state. All data entered after the initial installation will be deleted, including the **HTTP Proxy Cache**, the entire **E-Mail Queue**, **Accounting** and **Reporting** data, passwords, and uninstalled **Up2Dates**. The software version will not change. That is, all **System Up2Dates** and **Pattern Up2Dates** that have been installed will be retained.

#### 4.1.2. Licensing

**Novell Security Manager powered by Astaro** ships with a seven-day evaluation license included. No action is required to implement this license. If further evaluation is necessary beyond seven days, a 90 day demo license is available from Novell at:

**http://download.novell.com**

The demo license activates all features of Novell Security Manager, powered by Astaro, including the base product:

- Up2Date Service
- Spam Protection
- Virus Protection for E-Mail
- Phishing Protection
- Surf Protection
- Virus Protection for Web

If you decide after the expiry of the demo license, to use Novell Security Manager for your company, you'll need the base license. This base license can then be completed with up to four functions and security packages.

This base license and the four functions and security packages contain the following modules:

- Base license: Packet Filter, VPN Gateway and Intrusion Protection
- Maintenance & Support: Up2Date Service
- High Availability
- Secure E-Mail Subscription: Spam Protection, Virus Protection for E-Mail, Phishing Protection
- Secure Web Subscription: Surf Protection, Virus Protection for Web

The price of the company version depends on the size of the network to be protected, the scope of support and the modules, subscribed to in addition to the base license.

For more information, please visit our website under:

**http://www.novell.com/products/securitymanager**

**Licensing Novell Security Manager powered by Astaro**:

In order to license Novell Security Manager, you need a valid license string on the local host, so that you can enter it to Security Manager through the **WebAdmin** configuration tool.

**Note:**

When using a license with the **High Availability (HA)** option, you must enter the **License strings** to both Novell Security Managers (Normal and Hot Standby mode).

1. Open the **Licensing** menu in the **System** tab.
2. Enter the license string(s) in the **License Strings** entry field.
3. Click on the **Save** button.

The system will require between 30 and 60 seconds to process this information. After successful registration, the **Installed Licenses** window will contain the details of your license.

#### Installed Licenses

After successful registration of Novell Security Manager, the **Installed Licenses** window will show the details of your license.

#### Licensed Users (IPs)

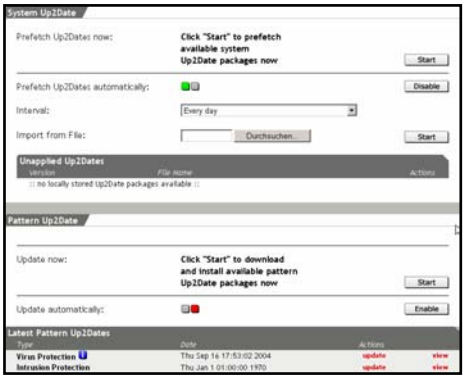
The functions in this window are used for licenses that do not allow for an unlimited number of users (IP addresses).

**View current User (IP) Listing**: The table contains all IP addresses that are relevant for the licensing. The current user table is always loaded when this menu is opened.

The table will also be displayed if the license is an unlimited version.

**Reset User (IPs) Listing**: If you wish to reconfigure the internal network, you can reset the user table by this action. Then there is a reboot - the system will shut down completely and reboot.
This action is enabled by clicking on the **Start** button.

### 4.1.3. Up2Date Service




The **Up2Date Service** makes it easy to keep your Security Manager software updated: New virus definitions, system patches, and security features will be installed to your current system.

All **Up2Date** data are digitally signed and encrypted, and are transferred over a secure channel. Any unsigned or forged **Up2Date** packages are rejected and deleted.

A number of servers are maintained for both **System Up2Date** and **Pattern Up2Date** that are dialed in the given sequence. If the first Up2Date server is not available, the system will automatically query the next system or pattern Up2Dates in the list.

**Important Note:**

In order to download updates, the **Up2Date Service** makes a TCP connection to the update server on port 443. Novell Security Manager will permit this connection without any adjustment. If there is another firewall gateway in place upstream, you must allow the communication via the port 443 TCP to the update servers.

**Note:**

When using the **High Availability (HA)** system, please note the special functions of **System Up2Date**.

#### System Up2Date

The **System Up2Date** function allows you to import system patches and new security features into your Novell Security Manager. The **Up2Date** packages can be downloaded either manually over an encrypted connection or automatically from the Update Server. If you don't have an Internet connection, you can also import Up2Date packages from a local volume.

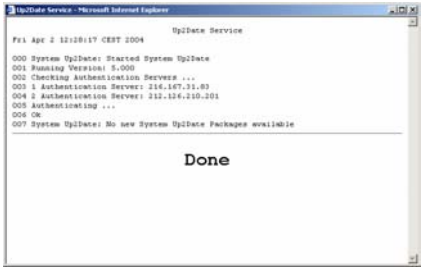
Newly imported Up2Date packages are presented with their respective version number and file name in the **Unapplied Up2Dates** table**.** These Up2Date packages have not been installed yet!
In order to get further information, touch the **blue info button** with the cursor. If the info button is highlighted **red**, there will be an automatic **restart** of Novell Security Manager after the installation of the System Up2Date package.

**Note:**

If you are using the **High Availability (HA)** system, please note the special notes for the import and installation of the **System Up2Dates**. The **HA** system is described in chapter 4.1.10 on page 74.

**Manually downloading System Up2Dates**:

1. Open the **Up2Date Service** menu in the **System** tab.
2. In the **System Up2Date** window, click the **Start** button under **Prefetch Up2Dates now**.




The system will now check if there are any new updates on the Update server, and will download any updates found. Details on the Up2-Date process can be found in the **Log Window**, shown in real-time (left-hand picture). When the **DONE** message appears, the process has completed successfully.

The **Unapplied Up2Dates** table lists any updates that have been downloaded but not yet installed!

If you are using the **HA** system, unapplied updates will be listed in the **Unapplied Up2Dates Master** window.

**Automatic download of System Up2Dates**:

1. Open the **Up2Date Service** menu in the **System** tab.
2. Click the **Enable** button under **Prefetch Up2Dates automatically.**
3. In the selection menu **Interval**, specify how often Novell Security Manager should contact the **Up2Date Server** to check for new **System Up2Dates.**

   The available choices are: every hour, every day, or once per week.

Newly imported Up2Date packages are presented with their respective version number and file name in the **Unapplied Up2Dates** table. Further information is available by clicking the Info button.
Note that the Unapplied Up2Dates in the table have not yet been installed yet!

If you are using the **HA** system, unapplied updates will be listed in the **Unapplied Up2Dates Master** window.

**Loading System Up2Dates from a local disk**:

The filename of an Up2Date update consists of the version number, **tar** to signify it is an encrypted archive file, and the file extension **.gpg**.

1. Open the **Up2Date Service** menu in the **System** tab.
2. In the **System Up2Date** window, click on the **Browse** button next to **Import from File**.
3. In the **File Upload** window, choose the Up2Date packages you would like to load and click on the **Open** button.

**Important Note:**

When using Microsoft Windows, make sure not to use a **UNC Path.** Instead, choose the updates by using the **Look in** option.

4. In the **System Up2Date** window, next to **Import from File**, click **Start.**

   Successfully loaded updates will appear in the **Unapplied Up2Dates** window with the version number and the file name. Further information is available by clicking the Info button.
   Note that the Unapplied Up2Dates in the table have not yet been installed yet!

   If you are using the **HA** system, unapplied updates will be listed in the **Unapplied Up2Dates Master** window.
5. Repeat steps 2 through 4 until all Up2Date packages have been imported.

**Installing System Up2Dates without the HA solution**:

1. Open the **Up2Date Service** menu in the **System** tab.
2. In the **Unapplied Up2Dates** table, choose the Up2Date updates to install.

**Note:**

If more than one **System Up2Date** file is listed in the table, start the **highest** version. The smaller versions will be installed automatically.

3. In the **Actions** column, click **Install**.

   The progress of the Up2Date installation on system 1 will be displayed in real time in the **Log Window.** When the **DONE** message appears, the process has completed successfully.

**Installing System Up2Date with the HA solution**:

1. Open the **Up2Date Service** menu in the **System** tab.
2. In the **Unapplied Up2Dates Master** table, choose the Up2Date updates to install.

**Note:**

If more than one **System Up2Date** file is listed, start with the **smallest** version. Only one package can be installed with the **HA** system.

4. In the **Actions** column, click **Install**.

   The progress of the Up2Date installation on system 1 will be displayed in real time in the **Log Window.** When the **DONE** message appears, the process has completed successfully.

   Then the installation automatiscally starts on system 2. During this process, the Up2Date package and the message **Polled by slave** will be displayed in the **Unapplied Up2Dates Slave** table.
   The table will show the message **No locally stored Up2Date packages available** when the installation on system 2 has completed successfully.

5. If the **Unapplied Up2Dates Master** table lists more unapplied updates, repeat steps 2 and 3 until all updates have been installed.

   The **HA** system is fully updated when the **Unapplied Up2Dates Master** table shows the message **No locally stored Up2Date packages available** and if both systems display the same version number.

### Pattern Up2Date


The **Pattern Up2Date** function updates the virus patterns for Novell Security Manager's integrated virus scanner and the Intrusion Protection System (IPS) with IPS attack signatures. You can choose to update signatures manually or automatically at certain intervals.

The **Latest Pattern Up2Dates** table shows the date of the most recently installed **Pattern Up2Date**. Virus Protection Patterns and Intrusion Protection attack signatures will be listed separately.

**Manual Pattern Up2Date**:

1. Open the **Up2Date Service** menu in the **System** tab.
2. In the **Pattern Up2Date** window, click the **Start** button under **Update now**.

The system checks now, whether new Pattern Up2Date packages are available on the Update Server, downloads and installs them to Novell Security Manager. Details on the complete Up2Date process can be found in the **Log Window**, shown in real-time. When the **DONE** message appears, the process has completed successfully.

The **Installed Pattern Date** will be updated when you click the **Up2Date Service** under the **System** tab, or when you next open this menu.

When using the **High Availability (HA)** solution, the virus scanner on system 2 will be automatically synchronized with system 1.

**Automatic Pattern Up2Date**:

1. Open the **Up2Date Service** menu in the **System** tab.
2. Click the **Enable** button under **Update automatically**.
3. In the selection menu **Interval**, specify how often Novell Security Manager should contact the **Up2Date Server** to check for new **Pattern Up2Dates**.

   The available choices are: every hour, every day, or once per week.

**Security Note:**

Choose the hourly update option to ensure that your system is always up to date.

The automatic **Pattern Up2Date** is now activated. Novell Security Manager will contact the **Up2Date Server** at regular intervals and check for new **Pattern Up2Dates.** Whenever new **Pattern Up2Dates** are installed, the administrator will be sent an e-mail containing a list of the newest virus signatures.

When using the **High Availability (HA)** solution, the virus scanner on system 2 will be automatically synchronized with system 1.

### Use Upstream HTTP Proxy


In this window you can define the connection to an **Upstream Proxy Server**. This function is required if you can only connect through such an Upstream Proxy to HTTP and HTTPS ports.

**Defining an Upstream Proxy Server**:

1. Open the **Up2Date Service** menu in the **System** tab.
2. Click **Enable** next to **Status** to enable the function and make the following settings:

   **Proxy IP Address**: Enter the IP address of the Upstream Proxy server into the entry field.

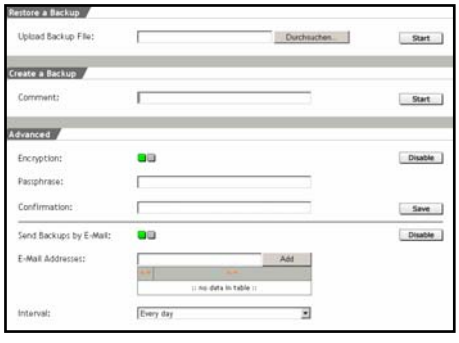
   **Proxy TCP Port**: Enter the port number of the Upstream Proxy server into the entry field.
3. Save the settings by clicking **Save**.
4. If an authentication is required for accessing the Upstream Proxy Server, enable the **Use Authentication** function and make the following settings:

   **Username**: Enter a username in the entry field.

   **Password**: Enter the password in this entry field.
5. Save the settings by clicking **Save**.

### 4.1.4. Backup

The **Backup** function allows you to save the settings of your Security Manager to a file on a local disk.




This backup file allows you to install a known-good configuration on a new or misconfigured Security Manager. This is especially useful in case of hardware failure, as it means re-placement systems can be up and running within minutes.

**Attention:**

Install the License Key in the **Licensing** menu before loading the backup. Without the appropriate license, the system will only support three network cards – under certain circumstances, this can lead to **WebAdmin** not being reachable.

**Note:**

After every system change, be sure to make a backup. This will ensure that the most current Security Manager settings are always available. Make sure that backups are kept securely, as the backup contains all of the configuration options, including certificates and keys.

After generating a backup file, you should always check it for readability. It is also a good idea to use an external MD5 program to generate checksums: this will allow you to check the integrity of the backup later.

#### Restore a Backup

This window allows you to install the backup file of the configuration.

**Loading a Backup**:

1. Open the **Backup** menu in the **System** tab.
2. In the **Restore a Backup** window next to the **Upload Backup File** entry field, click on the **Browse** button.
3. In the **File Upload** window, choose the Backup file, you would like to load and click on the **Open** button.

   **Note:**

   When using Microsoft Windows, make sure not to use a **UNC Path** for loading the backup. Select the Backup file with the help of the **Look in** selection window.
4. Click on the **Start** button.

   If, during the generation of the backup file, the **Encryption** function was enabled, the **Enter Passphrase** window will open.
5. In the **Passphrase** field, enter the password.
6. Confirm your settings by clicking **Start**.

   Novell Security Manager will now load and check the backup file. If the ckecksums are correct, you will now receive the **Backup Information**.
7. Check the **Backup Information**.

8. To import the backed-up settings into the active system, click the **Start** button.

When the message **Backup has been restored successfully** appears, the process has completed successfully.

#### Create a Backup

This window allows you to create and archive a backup file of the configuration of your Security Manager.

**Manually Creating a Backup**:

1. Open the **Backup** menu in the **System** tab.
2. In the **Create a Backup** window, in the **Comment** field, enter a description of this backup.
   When restoring system backups, this description will be displayed to help distinguish between different configurations.

> **Important Note:**
> If the **Encryption** function has been enabled, the backup file will be encrypted with either the **DES** or **3DES** algorithms, and can only be read or loaded using the correct password.

3. To generate the backup file, click the **Start** button**.**

   The system will now generate a backup file. When the message **Backup has been created successfully** appears, the process has completed successfully.
4. To copy the backup file to your local PC, click the **Save** button.
5. On the **File download** menu, choose the **Save file to disk** and click the **OK** button.
6. Choose a descriptive file name on the **Save file as** menu.
   Novell Security Manager will automatically produce file names, consisting of backup, date and time:
   backup_yyyymmdd_hhmmss.abf (astaro-backup-file).
7. Check the generated backup file for readability by importing it back into WebAdmin and clicking on the **Start** button.

   Novell Security Manager will now load and check the backup file. If the ckecksums are correct, you will now receive the **Backup Information**.
8. Abort the restore process by opening a different menu within the tab.

**Attention:**

After each system change, create a new backup file. If you load a new backup file and if, for example, you have changed the IP address or forgotten the password, you might not be able to access the newly configured system.

#### Advanced

**Encryption**: The backup file contains all configuration settings as well as the respective certificates and keys. The **Encryption** function allows you to encrypt the file using **DES** or **3DES**.

**Encryption of e-mail Backup Files**:

1. Open the **Backup** menu in the **System** tab.
2. Scroll to the **Advanced** window.
3. Enable the **Encryption** function by clicking on the **Enable** button.

   The **Encryption** function is enabled, when the status light shows green.
4. In the **Passphrase** entry field, enter the password.

**Security Note:**

With passwords with up to seven characters, the Backup file will be encrypted with **DES** and from eight characters on with **3DES**.

5. To confirm, enter the password again into the **Confirmation** entry field.
6. Click the **Save** button to save these settings.

All Backup files that have been created manually or automatically by the system, will now be encrypted with the defined password.

**Important Note:**

A backup file that has been encrypted with **Encryption** can only be loaded to the system with the password that was used for the creation of the Backup.

**Send Backups by E-Mail**: Novell Security Manager can also send you automatically created backup files by e-mail, so that you don't have to remember to save the settings of your Security Manager manually on a data carrier. Then the file is e-mailed to the entered e-mail address. These e-mailed files are about 100 kilobytes long.

**Generating an E-Mail Backup File**:

1. Open the **Backup** menu in the **System** tab.
2. In the **Advanced** window enable the **Send Backups by E-Mail** function by clicking on the **Enable** button.

   The **Backups by E-Mails** function is enabled, if the status light shows green.

   **Important Note:**

   If the **Encryption** function has been enabled, the backup file will be encrypted with either the **DES** or **3DES** algorithms, and can only be read or loaded using the correct password.

3. Use the **Interval** drop-down menu to define how often backups should be made.

   The available choices are: Daily, weekly, and monthly.
4. In the **E-Mail to** field, enter the e-mail addresses, which should receive the backup files in regular intervals.
5. Click the **Add** button next to the **E-Mail to** entry field, to add this address to the ordered list.

   If you would like to add more addresses, repeat step 5.
6. If you wish to generate and send a backup file immediately, click the **Start** button next to **Send backup now**.
7. Check the generated files for readability by importing the respective backup file and clicking on the **Start** button.

   Novell Security Manager will now load and check the backup file. If the ckecksums are correct, you will now receive the **Backup Information.**
8. Abort the restore process by opening a different menu within the tab.

**Editing E-Mail Addresses:**

Please see chapter 3.3.5 on page 30 for a description of how to use the **ordered list**.

### 4.1.5. SNMP


The **Simple Network Management Protocol** (**SNMP**) monitors and manages the local network. *SNMP* allows the administrator to make quick queries about the condition of the network devices, such as the number and configuration of the network interfaces, the forwarded traffic, the current processes and hard disk utilization. Next to the current state, tendencies and time rows are interesting. They give a detailed insight into the functions of a network – the history can be monitored and remedied before turning into a real problem.

Configure the access rights to the *SNMP* service in the **SNMP Access** window. The users of the configured networks can then conduct queries about the SNMP server on Novell Security Manager with their read only rights.

**Security Note:**

The **SNMP** data traffic (Protocol version 2) between Novell Security Manager and the network is not encrypted.

**Authorizing Access to the SNMP Server**:

1. Enable **SNMP Access** by clicking the **Enable** button.
2. From the **Allowed Networks** selection field, select the networks that you wish to allow for accessing the *SNMP* server.
3. Enter the **Community String** in this entry field.
4. Save your configuration by clicking **Save**.


In the **SNMP Traps** window you can define a *Trap-Server*, to which relevant information for the system administration is sent as SNMP Traps. To recognize those *Traps* a special SNMP monitoring software is required.

The messages, which are sent as *SNMP Trap*, contain the **Object ID** (**OID**). The *OID* for messaging events (1500), the classification of the message (DEBUG = 0, INFO = 1, WARN = 2, CRIT = 3) and the relevant error code (000 bis 999) are attached.

**Example**: The notification `INFO-354: Intrusion Protection Pattern Up2Date` succeeded Intrusion Protection Pattern Up2Date succeeded has in this case the *OID* `1.3.6.1.4.1.` and is assigned the following string:

[<HOST>][INFO][354]. For the wildcard <HOST> the hostname of Novell Security Manager will be displayed.

**Assigning the Trap Server**:

1. Enable **SNMP Traps** function by clicking the **Enable** button.

   The status light will show green and an advanced entry window will open.

2. In the **SNMP Tap Assignment** table, click the **New Assignment** button.

3. Click on the new line in the **Host IP Address** column.

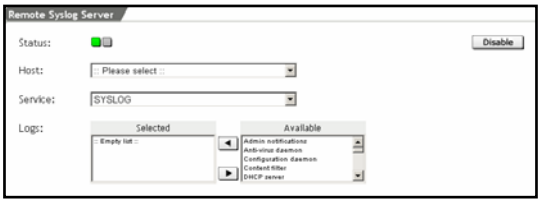
   An editing window will open.

4. Enter the IP address into the entry field of the server and save your entry by clicking on the **Save** button.

5. Click on the entry **public** in the **Community String** column and enter the *Community String* into the entry field.

The new assignment will be accepted immediately.

### 4.1.6. Remote Syslog Server




This function allows you to forward log messages from the Novell Security Manager to other hosts. This is especially useful for networks using a log host to collect logging information from a number of different hosts. By default, this function is disabled. A *Logging Daemon*, compatible with *Syslog* protocol must be running on the selected host.

**Attention:**

In the **System/Remote Syslog Server** menu, do not select one of the Novell Security Manager's interfaces (such as eth0) as the destination address (host).

**Host**: Enter the host, which should receive logging information in the drop-down menu. When a host has been selected, log forwarding is enabled immediately: no further messages are displayed.
In order to select a logging host (i.e., a network with netmask 255.255.255.255) you will first have to define it in the **Definitions/Networks** menu. The definition of networks is covered in greater detail in chapter 4.2 on page 80.

**Service**: The **Syslog** protocol is set by default. You can also use this drop-down menu to configure the service (port) that should be used on the remote server.

**Logs**: This selection field allows you to select log files that should be delivered to the remote host.

#### 4.1.7. User Authentication

Novell Security Manager supports **User Authentication** using the SOCKS v5, SMTP, and HTTP proxy services and can control which users are allowed to use which services. User accounts can be defined on the Security Manager, through the **Definitions/Users** menu. Or on an external user database. Supported external databases include **RADIUS**, **SAM** (Windows NT/Windows 2000/XP-Server), **Microsoft Active Directory**, the *domain* joining method of **NTLM** and **OpenLDAP**. If an external user database is already present on the network, you can use it instead of having to re-enter user accounts on Novell Security Manager itself.

**Important Note:**

Please note, that several authentication methods cannot be supported at the same time.

In *MS Windows* based networks the **Domain Controller (DC**) manages access to a set of network resources (e.g., applications, printers, etc.) for a group of clients. The user needs only to log in to the domain to gain access to the resources. A *Domain Controller* is a server that is running a version of the **MS Windows 2000 Server** or **2003 Server** operating system and has **Active Directory** (**AD**) installed, which is Microsoft's trademarked directory service.
A *directory service* provides a centralized location to store information in a distributed environment about network devices, services, and the people who use them. For MS Windows users it provides account information, privileges, profiles, and policy. When an authentication method is used together with *Active Directory* and with the corresponding settings, the authentication, e. g. before accessing an own *Service* is no longer made by Novell Security Manager but by the *Active-Directory*-Server.

User Authentication requires users to identify themselves before using network services. In comparison with an IP-based access control the user-based access control allows for user-based **Accounting** in the HTTP proxy access protocol.

#### Proxy Service and Authentication Methods

The **SOCKSv5**, **SMTP,** and **HTTP** services can be configured to allow or disallow clients based on IP address or on username and password combinations. In order to use **User Authentication**, you must select at least one database against which Novell Security Manager should authenticate users. If user authentication is enabled and no database is selected, the proxy service cannot be used.

Novell Security Manager supports user authentication against ...

- a Novell eDirectory server
- a RADIUS Server
- an NT SAM user list
- an Active Directory/NT Domain Membership
- an LDAP Server
- an internal database defined in WebAdmin

The five user databases can be checked one after the other.

#### 4.1.7.1. Novell eDirectory

**Novell eDirectory** – Novell Directory Service 8.7.1 - is an X.500-based index service designed to manage users, access rights, and other network resources. Novell provides the index service for Netware versions 5 and higher, MS Windows NT/2000, Linux, and Solaris and soon also for HP-UX.

**Configuring a Novell eDirectory Server**:

Make sure that there is a user configured on your LDAP server to have full read privileges for the directory. This will be the query user.

**Security Note:**

Ensure to grant **only** reading rights to the user.

In most cases, you should use the **groupMembership** query type with **Novell eDirectory (NDS8)**, as this allows an existing user index to be easily extended for proxy rights.
The index can also be configured to use user-defined attributes, which must be manually set for each user in the index. If you wish to authenticate on the basis of particular **User Attributes**, every user account in the directory must be edited to define access rights. This is done by setting a particular attribute for each user which either grants or denies access to a service.
You will need **Novell ConsoleOne** to configure the eDirectory Server.

The configuration and management of the Novell eDirectory server is described in detail in the accompanying documentation. You can find these documents at:

**http://www.novell.com/documentation/lg/edir87/index.html**

Then make the settings for the Internet security system.

**Configuring LDAP on your Security System**:

Make sure that there is a user configured on your LDAP server to have full read privileges for the directory. This will be the query user.

You will need the **Distinguished Name (DN)** of this user as well as the IP address of your Stand-alone-LDAP-server in order to complete the configuration of the security system.

**Security Note:**

Make sure that the user has only read privileges.

1. Open the **eDirectory** menu in the **System** tab.
2. In the **Novell eDirectory** window, enable the function by clicking **Enable** next to **Status**.

   **Server**: Enter the IP address of the LDAP server.

   **Port**: Enter the TCP port into the entry field. The standard port 636 is already entered.

   **Context**: In the control list define the group of the user from the index service, who shall be authenticated - e.g. in case of a use of the LDAP-syntax through the complete **Distinguished Name (DN)** of the user.
   Example: **DN**: cn=administrator, o=our_organization

   **Note:**

   Novell Directory Service groups can either be defined through *Common Name (CN)* of the group or through the complete *Distinguished Name (CN)* in the LDAP-syntax. As separator a comma is used. Dots for a delimitation are not supported.
3. If you wish to encrypt the connection to the LDAP-server through SSL/TLS-standard, enable the function in the **Use SSL** line by clicking on the **Enable** button.

   The encryption allows you to use the LDAP-authentication through *Novell eDirectory* also via public networks.
4. Save your changes by clicking **Save**.

#### Group Based Access Control

The Novell-eDirectory-groups can be used, to administer access controls for different authentication-clients. In the corresponding control list define the group of the user from the index service, who is to be authenticated here. The available services are:

**WebAdmin**: Controls the access to the *WebAdmin* configuration tool.

**HTTP**: Controls the profile assignment for the use of the HTTP-proxy.

**SMTP**: Controls the SMTP-authentication, if for example the TLS-encryption is enabled for the connection.

**SOCKS**: Allow client-server-applications a transparent use of the services of a network-firewall. The user authentication was executed within the SOCKSv5-protocol.

#### 4.1.7.2. RADIUS

**RADIUS** stands for **Remote Authentication Dial In User Service** and is a protocol for allowing network devices (e.g., routers) to authenticate users against a central database. In addition to user information, RADIUS can store technical information used by network devices. Such as protocols supported, IP addresses, telephone numbers, routing information, and so on. Together this information constitutes a user profile that is stored in a file or database on the RADIUS server.
In addition to authenticating dial-up users, **RADIUS** can be used as a generic authentication protocol.

The RADIUS protocol is very flexible, and servers are available for most operating systems, including Microsoft Windows NT/2000. The RADIUS implementation on Novell Security Manager allows you to configure access rights on the basis of proxies and users.

Before you can use **RADIUS** authentication, you must have a functioning RADIUS server on the network. As passwords are transferred in clear text (unencrypted), we strongly recommend that the RADIUS server be inside the network protected by Novell Security Manager, and that the Security Manager and server be on the same switch.

The following section details the setting up Microsoft IAS (RADIUS Server for MS Windows NT and 2000). If you use a different server, you will need the following information to enable the operation of Novell Security Manager together with the user authentication.

The authentication request comprises three set fields:

- Username
- Password in clear text (PAP)
- Type of proxy (the string **http, smtp** or **socks**) in the **NAS-Identifier** field

Your RADIUS server should use this information to determine whether or not access should be granted, and should send back a properly formatted reply.

**Configuring Microsoft's IAS RADIUS Server:**

**IAS** is a part of all versions of Microsoft Windows 2000 Server, but is generally not installed by default. For Microsoft Windows NT4, **IAS** is a part of the **NT4 Option Pack** and is available without charge. The MS Windows NT4 IAS has fewer features than the 2000 version, but is nevertheless sufficient for user authentication with Novell Security Manager.

1. Check that the **IAS** service is installed. If it is not, install it now.
2. Create a user group for every proxy to be used.

**Tip:**

Name the group according to the proxy to be used. For example, name the group for the HTTP Proxy **HTTP Proxy Users.**

3. For each group, add the users who should be allowed to use this proxy service.
4. Make sure that the user flag **Allow dial-in access to the network** is set for every user in these groups.
   You can find this setting in the user properties dialog box. MS Windows NT/2000 needs this flag to answer RADIUS inquiries.
5. Open the administration program for the **IAS** service.
6. Add a client. This requires the following information.

   **Client Name:** Enter the **DNS** name of your Security Manager here.

   **Protocol**: Choose **RADIUS**.

   **IP Address of the Client**: Enter the internal IP address of Novell Security Manager.

   **Client Vendor**: Choose **RADIUS Standard**.

   **Shared Secret**: Enter a password here. You will need this password again when configuring the RADIUS server with **WebAdmin**.

**Security Note:**

For the **Shared Secret** only passwords consisting of alphanumeric, minus (-), and period (.) characters are allowed. Other characters, for example %!#_{} are not allowed.

**7.** Now open the **RAS rules** menu.
A standard rule is listed here. If you intend to use **IAS** only with Novell Security Manager, you can delete this entry.

For every proxy, enter a rule. Choose a descriptive name, such as HTTP access.

Add two conditions:

1. Condition 1: The NAS Identifier field must correspond to a string from the following table.

| Proxy Type | NAS Identifier String |
|---|---|
| HTTP | http |
| L2TP over IPSec | l2tp |
| PPTP | pptp |
| SOCKS | socks |
| SMTP | smtp |
| WebAdmin Access | webadmin |
| Surf Protection | "Profilname" |

2. Condition: The Windows group of the user must match the group established in step 2.

Access is granted only when both conditions are met.

**8.** Edit the profile so that only an encrypted connection is allowed by disabling the **No Encryption** function in the **Encryption** register.

**9.** Edit the profile so that an unencrypted authentication is allowed by disabling the **Encrypted Authentication (PAP)** function in the **Authentication** register.
Leave the other values unchanged.

**10.** Open the **WebAdmin** configuration tool and open the **User Authentication** menu in the **System** tab.

**11.** In the **RADIUS Server Settings** window, click the **Enable** button next to **Status** (the status light will show green).


**Address or Hostname**: Enter the IP address or the host name of the RADIUS server.

**Shared Secret**: Enter the **Shared Secret** from step 6.

**12.** Click the **Save** button to save these settings.

13. In the **Proxies** tab, open the menu corresponding to the proxy service you wish to use.
14. If **User Authentication** is not enabled (red status light), click the **Enable** button.

    **Authentication Methods**: Choose RADIUS from the selection field.
15. Now confirm your settings by clicking on the **Add** button.

The user authentication using **RADIUS** is now active.
The IAS service will log every access attempt in the Microsoft Windows NT/2000 **Event Log**.

In order to prevent the Windows Event Log from overflowing, Novell Security Manager stores RADIUS access information for five minutes. This may mean that changes in the RADIUS database will not be reflected at Novell Security Manager for a few minutes.

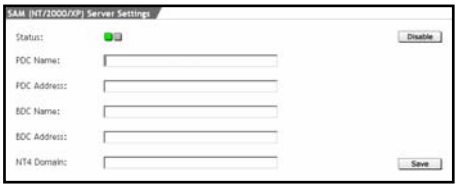
**Attention:**

Novell Security Manager sends queries on UDP port 1812.

#### 4.1.7.3. SAM – NT/2000/XP

This authentication method uses an MS Windows NT/2000 Domain Controller or standalone server. Many businesses already use MS Windows NT/2000 networks based on ActiveDirectory.
The advantage of SAM is that it is very easy to configure if the network already has a **Primary Domain Controller (PDC)** or if a server with a user database is running.
The drawback, however, is that this system does not distinguish between different user groups. You can either allow all users in an SAM database access to a proxy or none of them.

**Configuring SAM – NT/2000/XP:**




In order to use this authentication method, you will need to have a Microsoft Windows NT or 2000 server on your network that contains the user information. This can be either a Primary Domain Controller (PDC) or a standalone server.

Note that Windows servers have a NetBIOS name (the NT/2000 server name) as well as an IP address.

1. In the **System** tab, open the **User Authentication** menu.
2. In the **SAM (NT/2000/XP) Server Settings** window, click the **Enable** button next to **Status**.

   **PDC Name**: Enter the name of the Domain Controller in this entry field.
   Since, beginning with Windows 2000, these names are also official DNS names, only names consisting of alphanumeric, minus (-), and period (.) characters are allowed.
   Other characters, for example %!#_{} are not allowed.

   **PDC Address**: Enter the IP address of the Domain Controller.

   **BDC Name**: If you have a Backup Domain Controller, enter its name in this entry field. If you do not use a BDC, enter the name of the PDC here.

   **BDC Address**: If you have a Backup Domain Controller, enter its IP address here. If you do not use a BDC, enter the IP address of the PDC here.

   **NT4 Domain**: Enter the name of your MS Windows NT/2000-Domain. Allowed characters are: Letters of the alphabet, hyphen (-), and underscore characters (_).

**Note:**

This is not the Internet domain, as in Company.com, but rather a simple designator, e.g., **Intranet**. If you are using a standalone server rather than a Domain Controller, enter its NETBIOS name here. This corresponds to the **PDC Name** entry.

3. Confirm your settings by clicking **Save**.

**Security Note:**

For the **Shared Secret** only passwords consisting of alpha-numeric, minus (-), and period (.) characters are allowed. Other characters, for example %!#_{} are not allowed.

**Security Note:**

If you use SAM authentication, make sure to disable the **Guest** account on your Windows domain. Otherwise all username/password combinations will be accepted as valid.

#### 4.1.7.4. Active Directory/NT Domain Membership

In this authentication method the **NTLM** protocol is used. **NTLM** stands for **New Technology LAN Manager** and is a further development of the LAN manager protocol **LM** for the user authentication in Windows networks. The Challenge Response based *NTLM* protocol is by default contained in the MS Windows 2000, XP and 2003 Server operating systems. The Squid Proxy can authenticate users through this protocol.

With this authentication method a **MS Windows NT/2000 Domain Controller (DC)** is used for the evaluation of requests. For further information on *Domain Controller (DC)* please, refer to the introduction of the **User Authentication** menu on page 52.

The authentication method with *NTML* next to *RADIUS* also supports remote authentications. The method with *NTLM* in comparison to *RADIUS* offers the advantage that, due to the **Single-Sign-On**-mechanism, the user needn't always log in to the Internet with his **User Name** and **Password**.

The functioning of the domain-connection-method of *NTML* is completely different from the three other authentication methods on this Security Manager. In **MS Windows** environments, the authentication with *NTML* is in general configured for clients, using the **Internet Explorer** browser. However, also systems with clients that use the browsers **Firefox** or **Mozilla** (e.g. Mozilla 1.6) can be successfully operated.

**Note:**

In order for the **domain** joining process to work, one of the **Domain Controllers** (**DC**) for this *domain* must be in the systems broadcast range. The authentication with **NTLM** can at present only be used for the HTTP proxy to perform *Single-Sign-On* for **Internet Explorer** clients!

The notion of **Single Sign-On** (**SSO**) is in general used for a unique, central sign-on of a user into an IT structure. This is very useful since the user must enter his identification data only once and will then be authenticated for all centrally connected services. This allows for the implementation of a uniform user and rights structure in a company.

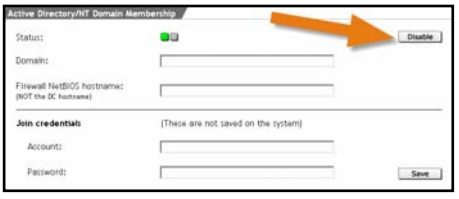
In the conception of a central and unique authentication that shall be based on existing infrastructures a series of requirements must be met:

- Central administration: user authentication data must be maintained on only single place only
- Simple use from the perspective of the user: data shall be consistent and not kept twice, i.e. only one password for all services
- Security: passwords shall not be readable for attackers

The advantage of the latter is that the data in the concept presented here are never transferred over networks without encryption and are subjected to a specific expiration period. This makes a Brute-Force attack against encrypted data almost impossible.

**Configuring Active Directory/NT Domain Membership**:

1. In the **System** tab, open the **User Authentication** menu.
2. In the **Active Directory/NT Domain Membership (NT/ 2000/XP) Server Settings** window, click the **Enable** button next to **Status**.




Disabling the **NTLM Domain Membership** in the **Status** line does not unregister Novell Security Manager from the domain. This must be done on the *domain controller*.

**Domain Member Status**: Shows **Joined domain „Domain-Name"** when join was successful.

**Domain**: Enter the name of your MS Windows NT/2000-Domain. Allowed characters are: Letters of the alphabet, hyphen (-), and underscore characters (_).

**Note:**

This is not the Internet domain, as in Company.com, but rather a simple designator, e.g., **Intranet**.

**NetBIOS Hostname**: Enter the *NetBIOS hostname* the Novell Security Manager should have in the domain. You can just invent a name. It does not have any additional significance. However, to avoid inconsistencies, please choose a name that is not already used in your domain.

**Attention:**

Please make sure not to use hostnames that are used by other systems and especially not the hostname of the domain controller – it could demote the Domain Controller to a Member Server!

**Account**: Enter the account name that is allowed to join computers to a domain. Usually it is the Administrator. This name is only used for joining the domain and is not saved on Novell Security Manager!

**Password**: Enter the password for the above *account*. This password is only used for joining the domain and is not saved on Novell Security Manager!

3. Confirm your settings by clicking **Save**.

Once, Novell Security Manager is successfully joined to the **Domain**, the confirmation will be displayed under **Domain Member Status**.

#### 4.1.7.5. LDAP Server

**LDAP**, the **Lightweight Directory Access Protocol** defines the way in which clients communicate with X.500-conforming directory services. The protocol thus specifies the type of access to such a directory service.

Novell Security Manager uses the **LDAP** protocol to authenticate users for several of its services. Novell Security Manager allows or denies access on the basis of certain attributes or group memberships established on the LDAP server.
This system supports the **Microsoft Active Directory** and **Novell eDirectory** LDAP servers as well as those based on the Open Source **OpenLDAP** software.

**Microsoft Active Directory** is an indexing service designed especially for Windows NT/2000 networks, and allows the central management and organization of network resources. It allows users to access system resources after a single sign on to a central server, and offers administrators centrally organized management of users, regardless of network topology or protocols used.
In order to use this directory service, you will need an MS Windows NT/2000 Domain Controller.

**Novell eDirectory** – Novell Directory Service 8 - is an X.500-based index service designed to manage users, access rights, and other network resources. eDirectory is available for Netware versions 5 and higher, MS Windows NT/2000, Linux, and Solaris.

The **OpenLDAP Foundation**, the group which manages the **OpenLDAP** open source project, has released the Stand-Alone LDAP server, called SLAPD. OpenLDAP can also be used to build a networked directory service with various other LDAP servers: For instance, the **iPlanet Directory Server** from Sun Microsystems is based on OpenLDAP code and fully compatible.

##### User Authentication

**LDAP** uses the **Distinguished Name (DN**) of a user to identify him or her. This name must be unique within the directory.

**Microsoft Active Directory (AD)** and **Novell eDirectory (NDS8**) give every object a defined **DN**. This DN identifies the object uniquely in the AD index or NDS tree. This **DN** is composed of the **Common Name (CN)** and **Domain Component (DC)**.
Example: CN=Administrator, CN=Users, DC=example, DC=com

**MS Active Directory** also allows for user authentication by User **Principal Name (UPN).** This name consists of the login name and DNS name of the domain.
Example: admin@example.com

**OpenLDAP** simply uses the **Common Name (CN)** to identify users. Please make certain that every user has a unique **CN**.

**Security Note:**

User authentication with a stand-alone LDAP server involves sending passwords in clear text over the network. As these passwords are not encrypted, an attacker with access to the network may be able to intercept them.

**Note:**

User authentication with an **LDAP Server** requires that the DNS **Proxy** on the **Proxies/DNS** menu be enabled.

**Configuring the Microsoft Active Directory Server:**

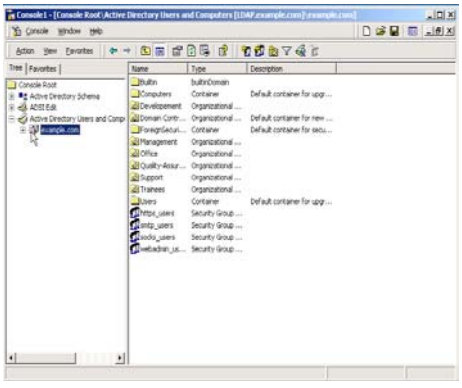
Make sure that there is a user configured on your LDAP server to have full read privileges for the directory. This will be the query user.

**Security Note:**

Make sure that the user has **only** read privileges.

**Microsoft Active Directory (AD)** can grant privileges on the basis of group memberships, or on the basis of particular user attributes. In most cases, it is easier to use the **Member Of** query type to authenticate by group.

The Directory can be extended by self-defined attributes. If you wish to authenticate on the basis of particular User Attributes, every user account in the directory must be edited to define access rights. This is done by setting a particular attribute for each user which either grants or denies access to a service.



The following example illustrates the configuration for a hypothetical small company **example.com**:

The user **John Smith** is in the **Trainees** directory.
**DN**: cn=john smith, ou=trainees, dc=example, dc=com.
**LogonName**: smith@example.com

This user can use his LogonName and password to log on to services like the SOCKS Proxy. Novell Security Manager checks the user's DN and

password. If there is only one DN that corresponds to smith@example.com, and if the supplied password is valid, the user will be allowed to use the SOCKS proxy.

If you wish to use **Group Membership** to control access rights, complete the following steps to configure the **Microsoft Active Directory**:

**Step 1 – Creating a Security Group**:

1. In the **Microsoft Management Console**, click the domain with the right mouse button.

   Example: Domain **example.com**
2. With the left mouse button, click **New** and then **Group**.

   A new window will open labeled **New Object - Group**.
3. Enter a unique name for the group in the **Group name** field.

   Example: **socks_users** for the SOCKS Proxy
4. Under **Group type** select **Security**.
5. Save your settings by clicking **OK**.

   You have now created a new **Security Group** named **socks_users**.

**Step 2 – Adding Users to the Group**:

1. In the directory, right-click the username.

   Example: **John Smith** in the **Trainees** directory.
2. Left click the **Properties** button.

   A window named **Properties** will open.
3. In the **Properties** window, select **Member Of** tab.
4. Click **Add** to add the new group.

   The **Select Groups** window will open.
5. Now choose the **Security Group** you wish to add the user to.

   Example: **socks_users**
6. Save your changes by clicking **OK**.

   The new **Security Group** will be added in the **Member Of** window.
7. Save your settings by clicking **OK**.

Now execute the settings on Novell Security Manager. The settings in the configuration tool **WebAdmin** are explained on page 68.

**Microsoft Active Directory, self defined attributes**:

User authentication with Microsoft Active Directory can also use user attributes to assign access rights. For large organizations, however, this can be time-consuming to configure.

**Note:**

According to the LDAP standard, each user attribute must have an associated **object ID, or OID**. Object ID numbers are designed to be unique across the entire Internet; in order to manage this, the **Internet Assigned Numbers Authority (IANA)** has been charged with assigning OID prefixes to organizations.

If your organization does not yet have an official OID space, you can request an OID prefix from the **IANA** at **www.iana.org**. Once you have an OID space, you should consider how best to use it to describe your network structure. Remember that each user attribute will require a unique OID.

In order to configure user attributes, the **Microsoft Management Console** must be used to modify the **Active Directory Schema**. In order to do this, you must first mark the schema as editable.

**Step 1 – Enable Editing of the Active Directory Schema**:

1. In the **Microsoft Management Console**, right-click **Active Directory Schema**.
2. Use the left mouse button to click **Operations Master**.

   The **Change Schema Master** window will open.
3. Check the option **The Schema may be modified on this Domain Controller**.
4. Save your changes by clicking **OK**.

   The **Active Directory Schema** can now be edited.

**Step 2 – Add New Attributes**:

1. Under **Active Directory Schema**, right click **Attribute**.
2. Use the left mouse button to click **New**.
3. In the **Create New Attribute window**, define the new attribute.

   **Common Name**: Enter a **CN** for this attribute.

   **LDAP Display Name**: Give the new attribute a clear label. The name of the service this attribute controls would be a good choice.
   Example: **Socks**.

   **Unique X500 Object ID**: Enter the OID for this attribute in the entry field.

   **Syntax**: Choose **Boolean**.

   **Minimum**: Leave this field blank.

   **Maximum**: Leave this field blank.

4. Save your settings by clicking **OK**.

**Step 3 – Allocate a Class for the Attribute**:

1. Under **Active Directory Schema**, left-click **Classes**.
2. Right-click **Users**.

   A window named **User Properties** will open.
3. Click the **Attributes** tab and make the following settings.

   **Optional**: Use the drop-down menu to select the attribute and click **Add**.
4. Save your settings by clicking **OK**.
5. In the **Microsoft Management Console**, right-click **Active Directory Schema**.
6. With the left mouse button, click **Reload the Schema**.

**Step 4 – Setting the Attribute for Users**:

1. In the **ADSI Edit** window, right-click the user to edit.

   Example: **John Smith** in the **Trainees** directory.
2. Left click the **Properties** button.

   A window named **Properties** will open.
3. In the **Properties** window, click the **Attributes** tab.
4. **Select which properties to view**: Choose **Both**.
5. **Select a property to view**: Choose the attribute to set.
   Example: **Socks**.

   **Syntax**: This value was set while creating the attribute and cannot be changed.
   From step 2, this should be. **Boolean**.
   **Edit Attribute**: You can use this field to set the value of the attribute. The possible values are **TRUE** and **FALSE**.
   **Value(s)**: The current value of the attribute is shown here.
6. Save your settings by clicking **OK**.

Now make the settings on Novell Security Manager. The settings in the configuration tool **WebAdmin** are explained on page 68.

**Configuring a Novell eDirectory Server**:

Make sure that there is a user configured on your LDAP server to have full read privileges for the directory. This will be the query user.

**Security Note:**

Make sure that the user has **only** read privileges.

In most cases, you should use the **groupMembership** query type with **Novell eDirectory (NDS8)**, as this allows an existing user index to be easily extended for proxy rights.
The index can also be configured to use user-defined attributes, which must be manually set for each user in the index. If you wish to authenticate on the basis of particular User Attributes, every user account in the directory must be edited to define access rights. This is done by setting a particular attribute for each user which either grants or denies access to a service.
You will need **Novell ConsoleOne** to configure the eDirectory Server.

The configuration and management of the Novell eDirectory server is described in detail in the accompanying documentation. You can find these documents at:

**http://www.novell.com/documentation/lg/edir87/index.html**

Then make the settings for Novell Security Manager. The settings in the configuration tool **WebAdmin** are explained on page 68.

**Configuring the OpenLDAP Server**:

Make sure that there is a user configured on your LDAP server to have full read privileges for the directory. This will be the query user.

**Security Note:**

Make sure that the user has **only** read privileges.

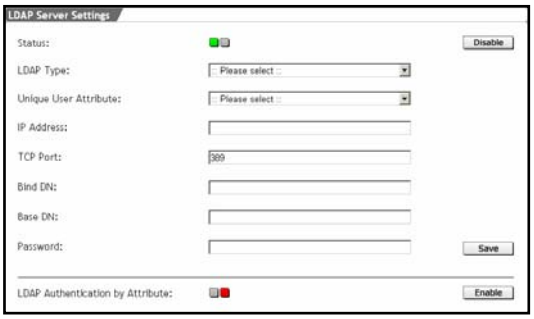
With **OpenLDAP**, users are identified on the basis of their **Common Names (CN)**. Please make certain that every user has a unique **CN**.

**Important Note:**

With the installation of the software alle existing data will be deleted from the computer!

Because there are many different LDAP servers based on the **OpenLDAP** code, it is impossible to describe them all here. For further information, please consult the documentation accompanying your LDAP server.
If you are using the **SLAPD** server from the **OpenLDAP Foundation**, the current documentation is available at:
**http//www.openldap.org**.

**Configuring LDAP on Novell Security Manager**:




Make sure that there is a user configured on your LDAP server to have full read privileges for the directory. This will be the query user.

You will need the **Distinguished Name (DN)** of this user as well as the IP address of your LDAP server in order to complete the configuration of Novell Security Manager.

**Security Note:**

Make sure that the user has only read privileges.

1. In the **System** tab, open the **User Authentication** menu.
2. In the **LDAP Server Settings window**, enable the system by clicking **Enable** next to **Status**.

   **LDAP Type**: Choose the type of LDAP server to use.
   The available choices are: **Microsoft Active Directory**, **Novell eDirectory** and **OpenLDAP**.

   **Unique User Attribute**: This attribute defines how users should be authenticated on the LDAP server. The attributes available here depend on the type of LDAP server you are configuring. If you wish to use a self-defined attribute for authentication, select **Selfdefined** here.

   With the **Microsoft Active Directory** server, you can also choose to authenticate by **User Principle Name (UPN)** or **saMAccountName**.

   The **Novell eDirectory** and **OpenLDAP** servers allow authentication by the **Common Name (CN)**, **Surname (SN)**, and **Unique Identifier (UID)** attributes.


   **Attribute Name**: This entry field is only shown if you have selected to authenticate by a **Selfdefined** attribute from the **Unique User Attribute** drop-down menu.

   Enter the attribute to use for authentication here.

   **IP Address**: Enter the IP address of the LDAP server.

   **TCP Port**: Enter the TCP port of the LDAP service. By default, this is set to 389 (the standard port for LDAP).

**Bind DN**: The value to enter here depends on the type of LDAP server you are using.

**1. Microsoft Active Directory**

**Microsoft Active Directory** can use either the **User Principal Name (UPN)** or the full **Distinguished Name (DN)** of the user.
Examples:
**UPN**: admin@example.com
**DN**: cn=administrator, cn=users, dc=example, dc=com

**2. Novell eDirectory**

Enter the full **Distinguished Name (DN)** of the user.
Example:
**DN**: cn=administrator, o=our_organisation

**3. OpenLDAP**

**OpenLDAP** and OpenLDAP-conforming servers can only use the **Distinguished Name (DN)** of users.

**Base DN**: Enter the object name to be used as the basis for all client actions.
Examples:
For MS Active Directory: dc=example, dc=com
For Novel eDirectory: o=our_organisation

7. Enter the password in the **Password** entry field. This password should also be used for the Administration of the Stand-alone-LDAP-Server.

**Security Note:**

Use a secure password! Your name spelled backwards is, for example, not a secure password – while something like xfT35$4 would be.

8. If you wish to encrypt the connection to the LDAP server through SSL/TLS standard, enable the function in the **Use TLS encryption** line by clicking on the **Enable** button.

   The encryption allows you to use the LDAP authentication also via public networks.

9. Click the **Save** button to save these settings.

**Security Note:**

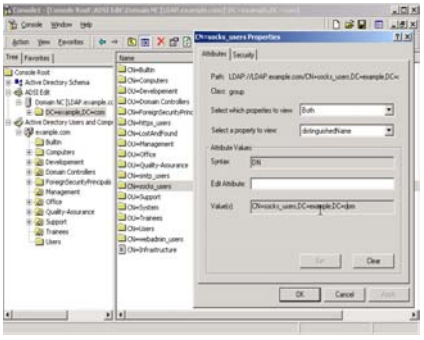
As long as the **LDAP authentication by attribute** function is disabled, all users who are listed in the directory with a unique **DN** and a valid password can use the **HTTP**, **SMTP** and **SOCKS** proxies, and can also access the **WebAdmin** tool.

**Advanced Authentication with LDAP**:

1. Enable the **LDAP authentication by attribute** function by clicking **Enable** next to **Status**.
2. Use the **Service** drop-down menu to select a service.

   The available services are: **HTTP**, **SMTP**, **SOCKS** and **WebAdmin**.
3. In the **Attribute Name** field, enter the name of the attribute.

   If you are using authentication using the **MemberOf** property on a **Microsoft Active Directory** Server, this should be the name of the **Security Group** to use.
   Example: **socks_users**.
4. In the **Attribute Value** field, enter the **DN** for the attribute. The attribute value is the **DN**.

   **Microsoft Active Directory** displays the **DN** of attributes in the **Management Console**, under **ADSI Edit**:

   Here, under the **Base DN** (example: dc=example, dc= com), find the attribute name (example: socks _users) and right-click it. A window labeled **CN=socks_users Properties** will open.

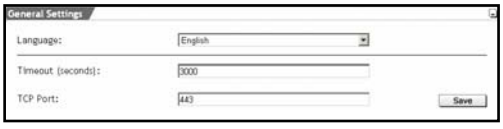
   Use the **Select which properties to view** drop-down menu to choose **Both**, and in the **Select a property to view** drop-down menu, choose **distinguishedName**. The **DN** for this attribute will be shown in **Value(s)**.
5. Click the **Save** button to save these settings.

Every member defined as a **MemberOf** the security group **socks_users** will be allowed to use this service.

### 4.1.8. WebAdmin Settings

Configure the access to the **WebAdmin** configuration tool in this menu.

#### General Settings



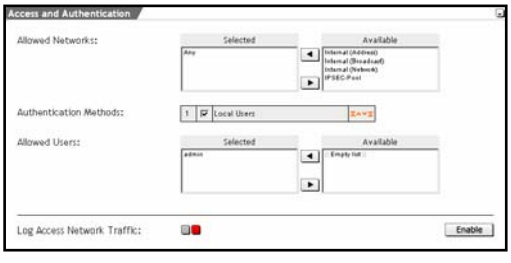

**Language**: In this drop-down menu you can determine the language.

**Timeout (seconds)**: In this entry field enter the intervals in seconds, in which **WebAdmin** automatically logs you out, if there are no actions. By default, the system is set to 300 seconds after the installation. The smallest possible interval amounts to 60 seconds.
Click the **Save** button to save these settings.

If you close your browser with an open **WebAdmin** session without closing **WebAdmin** through **Exit**, the last session remains active until the end of the time-out.

**TCP Port**: If you want to use the standard port 443 for the HTTPS service for another purpose (such as a deviation with **DNAT**), you must enter another TCP Port for the **WebAdmin** Interface here. Possible values are 1024-65535, while certain ports are reserved for other services. In order to address **WebAdmin** after a modification, you must separately link the port through a colon to the IP address of Novell Security Manager, e.g.: https://192.168.0.1 :1443.

#### Access and Authentication




**Allowed Networks**: Add those networks to the selection field that are authorised to access **WebAdmin**. As with **SSH**, **Any** is entered here for a smooth installation. In this case and if the password is available, **Web-Admin** can be accessed from everywhere.

**Security Note:**

As soon as you can limit the access to the Internet security administration (for example your IP address in the local network), replace the **Any** entry in the **Allowed Networks** selection field through a smaller network.

The safest solution is, if only one administrator PC has access to Novell Security Manager through HTTPS.
Networks can be defined in the **Definitions/Networks** menu.

**Authentication Methods**: Select the authentication method in the selection field. In order to give you access to Novell Security Manager through the configurations tool **WebAdmin** after the installation, the authentication method **Local Users** has already been defined here and the respective **User** hase been entered in the **Allowed Users** selection menu.

Further available authentication methods are **NT/2000/XP Server**, **RADIUS Database** and **LDAP Server**.

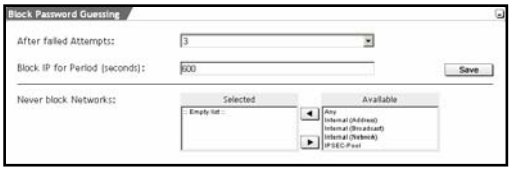
Local **Users** are administered in the **Definitions/Users** menu.

**Allowed Users**: By default this is set to the user **admin**.

**Local users** are defined in the **Definitions/Users** menu.

**Log Access Network Traffic**: All connections to the **WebAdmin** configuration tool are logged to the **Packet Filter Logs** as **Accept** rule. The **Packet Filter Logs** can be found in the **Local Logs/Browse** menu. By default, this function is disabled.
Enable this function by clicking on the **Enable** button (status light on green).

#### Block Password Guessing




This function can be used to limit the number of attempts to log in to the **WebAdmin** configuration tool. After a specific number of attempts, the access from this IP address will be denied for a given time span.

**Configuring the Blocking Protection for Login Attempts**:

1. In the **System** tab, open the **WebAdmin Settings** menu.
2. Make the following settings:

   **After failed Attempts**: Select the maximum allowable number of attempts in the drop-down menu.

   **Block IP for Period**: Enter the time span for the blocking protection in the entry field.
3. Save your changes by clicking **Save**.

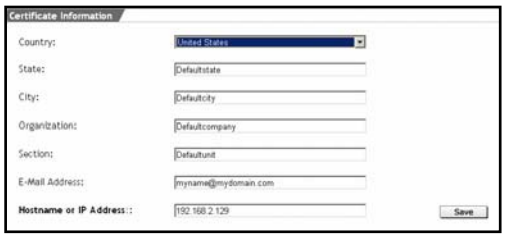
Now, the blocking protection is enabled. The **Never block Networks** window, allows you to exclude networks or hosts from the blocking protection.

### 4.1.9. WebAdmin Site Certificate

Encryption systems are an important part of many modern security devices. They are used, for example, when transmitting confidential infor-

mation over **Virtual Private Networks** (in chapter 4.7 on page 220), in **User Authentication** and **Up2Date Service** or, to securely administer Novell Security Manager over the network.

Certificates and Certificate Authorities (CA) are an essential part of modern cryptographic protocols, and help close the gaps left open by other systems. **Public Key** Algorithms offer a particularly elegant form of encryption. They do, however, presuppose that the public keys of all communications partners are known.
At this point, a third, trusted party is used to ensure the validity of public keys. The third party issues certificates guaranteeing the authenticity of these keys: this third party is called a **Certificate Authority (CA)**. A certificate is a record in a standardized format with the owner's most important data - his name, and his public key - and is signed with the private key of the **CA**. The format for these certificates is defined in the X.509 standard.
In a certificate, the **CA** certifies, with its own signature, that the public key belongs to the person (or entity) it says it does. As the certificate contains information such as the name of the owner, duration of validity, issuing authority, and the signature of the CA, it can be seen as a kind of digital passport.




The **WebAdmin Site Certificate** menu allows you to create two certificates: first a CA certificate, which will be installed in your browser, and second the server certificate (signed by the CA certificate) which the system uses to authenticate itself to your browser. These two certificates contain the company's data and the system's hostname.

**Creating a Certificate for WebAdmin**:

1. Under the **System** tab, open the **WebAdmin Site Certificate** menu.
2. In the **Certificate Information** menu, enter the appropriate information for your firm.

   **Country**: Choose your country from the drop-down menu.

   **State**: Choose the state or region where you are.

   **City**: Enter the name of city.

   **Organization**: Enter the company's name.

   **Section**: Enter the department.

   **E-Mail Address**: Enter your e-mail address.
3. In the field **Firewall Hostname**, enter the host name or IP address of Novell Security Manager you use to access **WebAdmin**.

**Example**: If you access **WebAdmin** through the URL https://192.168.10.1, enter 192.168.10.1 here.

4. Save your entries by clicking the **Save** button.

**Installing a Certificate for WebAdmin**:

1. To install the CA Certificate in your browser, click **Import Certificate into Browser** in the **CA Certificate Installation** window.

   The next few steps depend on your browser. For example, with Microsoft Internet Explorer, the **File download** dialog opens.

   **Save file to disk**: This option allows you to save the certificate to a local disk before installing it.

   **Open the file from current position**: This allows you to install the certificate directly. The **Certificate** window will open. These registers allow you to inspect the information contained in the certificate before installing it.

5. Click the **OK** button to start the process.

**Note:**

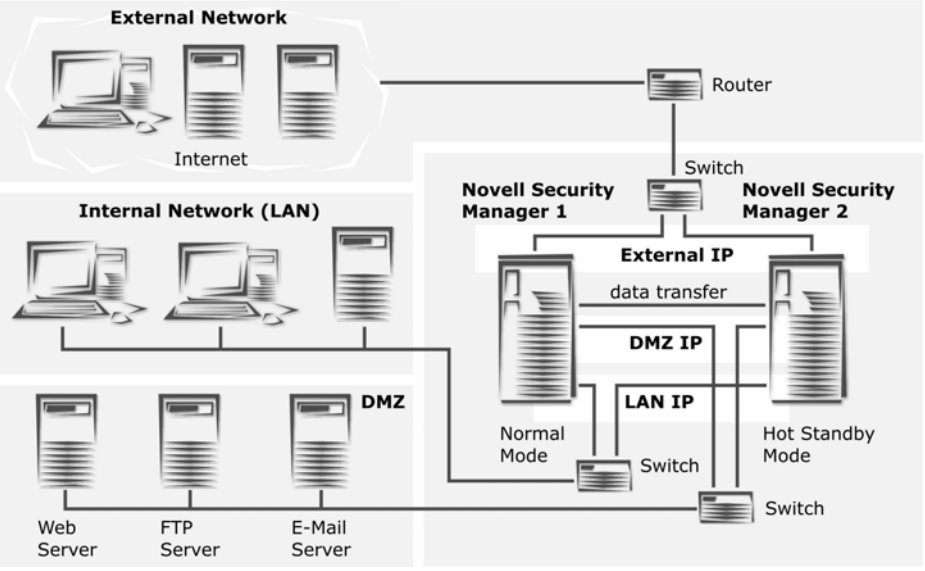
Due to system time differences and timezone offsets, the generated certificate may not yet be valid. Many browsers wrongly report that such certificates have expired, however this is not the case and any generated certificates will become valid after a maximum of 12 hours.

#### 4.1.10. High Availability

The main cause for a security device and/or a firewall failure is a hardware failure, such as a failure of the power supply, hard disk, or processor. The **High Availability (HA)** system allows you to use two Novell Security Managers with identical hardware in parallel. Security Manager 1 runs in normal mode (Master). Security Manager 2 is in Hot-Standby mode (Slave) and monitors the active system through Link Beat via the data transfer connection. Security Manager 1 regularly sends Heart Beat requests through this connection, which are answered by system 2. If necessary, the Security Manager 2 also receives updates through this data transfer connection so that, in the case of system failure on the primary, it can take over operations immediately.

The graphic shows a network architecture with a *High Availability (HA)* system, to which an internal network and a DMZ is connected.

The installation instruction describes how to connect one private network to a *HA* system:




#### Hardware and Software Requirements

- A license with the **High Availability** option: the **License Key** must be imported to both security managers (Normal and Hot Standby mode)!

  For more information on **Licensing**, see chapter 4.1.2 on page 38.
- 2 Novell Security Managers with identical software version and hardware
- 2 additional Ethernet network cards for the data transfer line: for monitoring the Heart Beat requests two Ethernet network cards that support this function are necessary!
- 1 Ethernet crossover cable
- 1 serial interface cable (optional)
- 2 switches

---

**Important Note:**

The hardware components, supported by Novell Security Manager, e.g. for a monitoring through Heart Beat requests are listed under **http://www.novell.com/documentation/nsma51** in the **Hardware Compatibility List for Novell Security Manager powered by Astaro** tab.

---

**Important Note:**

If you use a Novell Security Manager for the **High Availability (HA)** system that was already in use, ensure that you update the second Security Manager to the same version as system 1 prior to the configuration.

#### Installing the High Availability System

This installation instruction describes the necessary settings for the connection of the **High-Availability** system to one internal network. For this configuration you need three network cards on both Security Managers: One to the *internal network* (eth0), one to the *Internet* (eth1) and one for the *data transfer connection* (eth2) between the two Security Managers. For each additional internal network (e.g. a DMZ) another switch is required.

**Preperation**:

1. ***Installing the Software on both Computers:***

   Install the software on both computers.

   For a description of how to install the software please see chapter 2.2.1 on page 18.

2. ***Starting the WebAdmin Configuration Tool and Configuring the System Passwords:***

   Configure all necessary passwords on both Security Managers. If the **High Availability** system is configured and administered later with the **Configuration Manager**, you also have to configure the **Configuration Manager user** (**wwwrun**) password.

3. ***Connecting the Hardware:***

   In order to connect the hardware components (system 1 and 2, Switches etc.) as shown in the graphic you have to know which **Sys ID** has been assigned to which network card on the respective Security Manager.
   The interfaces must be identically configured on both Security Managers. Network cards with the same **Sys ID** must be connected to the same network: The interface to the **Sys ID eth2** is used here for example as data transfer connection.

   In order to determine the **Sys ID** assignment, open the **Network/ Interfaces** in the **WebAdmin** configuration tool.

   All network cards installed to the Novell Security Manager are listed in the **Hardware Device Overview** table.

   If the network cards are from diverse producers and/or of another type you can read the **Sys ID** assignment here and identify the

hardware correspondingly. If these are the same network cards proceed as follows:

The internal network card (eth0) was already configured during the installation of the software. In order to assign the **Sys ID** to the other network cards, set-up all network cards as **Standard-Ethernet** network cards, with the exception of the *Interface for the data transfer connection* (e.g. **Sys ID eth2**).

**Important Note:**

The network card for the data transfer connection mustn't be configured in the **Network/Interfaces** menu. This interface is set-up later in the **System/High Availability** menu. For the monitoring via Heart Beat request reserve a network card that supports this function.

Now, successively connect your client to the network cards of the Security Manager and execute the ping order. With the help of the corresponding IP address you can then assign the respective **Sys ID**.

Please, see page **Error! Bookmark not defined.** for a description of how to execute a ping command.

Then shut down both Security Managers and connect the hardware components as shown in the graphic on page 74.

***4. Configuring System 1 (Normal Mode):***

In the **System** tab, open the **High Availability** menu.

Click the **Enable** button next to **Status** to enable the option.

**Device Name**: Enter a descriptive name for the device here. This name allows you to know which of both systems is running in normal mode. This device name can be up to 11 characters long.

**Encryption Key**: Enter the password in this entry field.

**Security Note:**

Use a secure password! Your name spelled backwards is, for example, not a secure password – while something like xfT35$4 would be.

**Network Interface Card**: Select a network card to be used for the data transfer connection (example: **eth2**). You can only select those network cards that have not been configured before in the **Network/Interfaces** menu.

**Important Note:**

The network cards must have the same Sys ID (e.g., eth 2) on both systems. If you wish to use Heart Beat monitoring, use this menu to choose network cards on both the normal and standby systems which support this function.

**Device IP**: Assign an IP address from a Class-C-network to each Security Manager within the HA device group. The IPs must be within an address range and may only be used once within a given device group. Example: The *Device IP 10.0.14.1* is assigned to the *Novell Security Manager 1* and the *Device IP 10.0.14.2* to *Novell Security Manager 2*.

**Note:**

The data transfer connection must only use a Class C network – that is a network with mask 255.255.255.0. The bitmask form cannot be entered here. The network defined for the data transfer cannot be used anywhere else.

**Serial Interface (optional)**: In addition to watching the data transfer connection, the standby system can monitor the active system through the serial interface. No data is transferred over this connection. Select the appropriate serial interface from the drop-down menu.

**Note:**

When you save the settings as described in the following, the system will shut down and reboot immediately.

Save your changes by clicking on the **Save** button.

System 1 will now restart. If a keyboard is connected, the **Num Lock** LED will blink on the keyboard.

When the system gets into the Hot-Standby mode, the system will beep twice and the LED will stop blinking. Because system 2 is still disabled, system 1 will boot normally into normal mode, and the **Num Lock** light will blink again.

After system 1 completes the boot process, the **Num Lock** light will stop blinking, and the system will beep five times in second cycles: this signals that the middleware has successfully loaded and initialized all services, rules, and processes.

**Note:**

If the beeps are not heard, and the LED light continues to blink, the middleware was unable to initialize all services, rules, and processes. If this happens, please contact the service department of your security solution supplier.

***5. Configuring System 2 (Hot Standby Mode):***

Start system 2 and also execute step 4 on system 2 and then click the **Save** button to confirm.

System 2 will now restart. If a keyboard is connected, the **Num Lock** LED will blink.

When the system reaches the Hot Standby mode, the system will beep twice and the LED will stop blinking. System 2 recognizes system 1 through the data transfer connection, and remains in Hot-Standby Mode.

Das **High Availability** system is now active.

The Novell Security Manager in the Hot-Standby mode will be updated at regular intervals over the data transfer connection. Should the active system encounter an error, the second system will immediately and automatically change to normal mode and take over the system's functions.

#### 4.1.11. Shut down/Restart

**Restart** will shut the system down completely and reboot. Depending on your hardware and configuration, a complete **Restart** can take up to 5 minutes.

**Restart**:

1. Under the **System** tab, open the **Shut down/Restart** menu.
2. In the **action** drop-down menu, choose **Restart**.
3. Begin the reboot by clicking **Start**.
4. When asked **Do you really want to restart?**, click **OK**.

The action **Shut down** allows you to shut the system down, and allows you to cleanly stop all running services.

For systems without a monitor or LCD display, the end of the shut down process is signaled by an unending series of beeps at one-second intervals.

Depending on your hardware and configuration, this process can take up to 5 minutes. Only after the system has completely shut down, signaled by the **Power down** message, should you turn off the power. If the system is turned off without being shut down properly, the system must check the consistency of the file system: this means that the next boot will take longer. In the worst case, data may be lost.
The system will beep five times in a row to signal a successful startup.

**Shut down**:

1. Under the **System** tab, open the **Shut down/Restart** menu.
2. In the **Action** drop-down menu, choose the **Shut down** action.
3. Begin the shutdown by clicking **Start**.
4. When asked **Do you really want to shut down?**, click **OK**.

## 4.2. Networks and Services (Definitions)

The **Definitions** tab allows you to define networks and services for all of the other configuration menus (e.g., the packet filter, VPN, proxies, etc.) in one central location. This allows you to work with the names you define, rather than struggling with addresses, ports, and network masks. Another advantage is, that you can group individual networks and services together and configure them all at once. If, at a later date, you assign certain settings to these groups, they will apply to all networks and services contained therein. It is even possible to make groups of groups. Local users for the proxy services can also be defined here.

### 4.2.1. Networks


In the **Networks** menu, the hosts and networks and also the network groups are defined.

The network table contains static networks which have been predefined. By default, the table contains next to the definitions for the internal network card eth0 additional statically entered networks. These statical networks cannot be edited or removed. The hosts and networks can be grouped together. These groups will be treated as individual hosts and networks and can belong to an upstream group. The network types are represented by symbols.

The following pages contain a description of the different network types available and of how they are defined.

The network types are represented by symbols:

**The Symbols**

| Icon | Column | Display/Setting |
|---|---|---|
|  | Network type | Interface |
|  | Network type | Host/Server |
|  | Network type | Network |
|  | Network type | Network group |
|  | Network type | DNS server |
|  | Network type | DNS server (Multiple RRs) |
|  | Network type | IPSec user group |

**Adding Host**:

1. Under the **Definitions** tab, open the **Networks** menu.
2. Click on the New Definition button.
3. The entry window will open.
4. Make the following settings:

   **Name**: In the entry field, enter a unique host name.

   > This name will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

   **Type**: Select **Host** from the drop-down menu.

   **Address**: Enter the IP address in the entry field.

   **Comment**: You can enter a host description in this entry field.
5. Save the host by clicking on the **Add Definition** button.

If the definition is successful, the new **Host** will be entered in the network table. You will now find this host under its name also in different other menus. You could, for example define this host under **System/Remote Syslog** as **Remote Syslog Server**.

**Adding Network**:

1. Under the **Definitions** tab, open the **Networks** menu.
2. Click on the **New Definition** button.

   The entry window will open.
3. Make the following settings:

   **Name**: In the entry field, enter a network name.

   > This name will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

   **Type**: Select **Network** from the drop-down menu.

   **Address/Netmask**: Enter the IP address in the entry field and select the network mask from the drop-down menu.

   **Comment**: You can enter a network description in this entry field.
4. Save the network by clicking on the **Add Definition** button.

**WebAdmin** will check that your entries are valid.

After successful definition, the new **network** will appear in the network table. The network name will also be available for use in various configuration menus.

Using the network name you can, for instance, enable HTTP proxy access for the new network under **Proxies/HTTP**.

**Adding DNS Server**:

**The domain Name System** (**DNS**) is a distributed data base for the management of the name spaces in the Internet. *DNS* allows to either convert the name to an IP address (Forward Lookup) or, in the other case, to convert the address to a name (Reverse Lookup). In this security system, the first variant is used.

The **DNS Hostname** type should only be used in connection with the DynDNS end points. The security system resolves the definition according to the Time-to-live-value (TTL) and then updates it with the new IP address. This network-definition can be used in all configurations. It is particularly useful for *IPSec-VPN*-endpoints and *SMTP Route Targets*.

The **DNS Hostname type (multiple records)** should be used universally for all other address resolutions, when it is not sure, that from this *DNS* only one IP address will be mapped.

1. Under the **Definitions** tab, open the **Networks** menu.
2. Click on the **New Definition** button.

   The entry window will open.
3. Make the following settings:

   **Name**: In the entry field, enter a unique DNS Server name.

   > This name will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

   **Type**: Select **DNS Hostname** from the drop-down menu.

   **Hostname**: Enter the hostname in this entry field.

   **Comment**: You can enter a DNS Server description in this entry field.
4. Save the host by clicking on the **Add Definition** button.

If the definition is successful, the new **Host** will be entered in the network table. You will now find this host under its name also in different other menus.

**Defining Network Group**:

1. Under the **Definitions** tab, open the **Networks** menu.
2. Click on the **New Definition** button.

   The entry window will open.
3. Make the following settings:

**Name**: In the entry field, enter a unique network group name.

> This name will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

**Type**: Select **Network Group** from the drop-down menu.

**Initial Members**: From the selection field, select the network card by pressing the **Ctrl**-key on the keyboard and selecting the name with the mouse.

**Comment**: You can enter a network group description in this entry field.

4. Save the network group by clicking on the **Add Definition** button.

After successful definition, the new **network group** will appear in the network table. The network group name will also be available for use in various configuration menus.

**Defining IPSec user group**:

This definition contains only the **Distinguished Name** (**DN**). It is used for incoming IPSec connections, using X.509 certificates. If the DN of the group corresponds to the one of the user, his virtual IP address will dynamically be added to the group.

1. Under the **Definitions** tab, open the **Networks** menu.
2. Click on the **New Definition** button.

   The entry window will open.
3. Make the following settings:

   **Name**: In the entry field, enter a unique name for the IPsec user group.

   > This name will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

   **Type**: Select **IPsec User Group** from the drop-down menu.

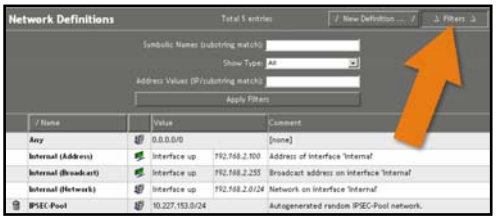
   **DN Template**: For the VPN-ID-Type **Distinguished Name** you will need the following data from the X.509 tab tree: Country (C), State (ST), Local (L), Organization (O), Unit (OU) Common Name (CN) and E-Mail Address (E).
   The data must be listed in the same order as a certificate in this entry field.

   **Comment**: You can enter a IPsec user group description in this entry field.

**4.** Save the IPsec user group by clicking on the **Add Definition** button.

After successful definition, the new **IPSec user group** will appear in the network table. The IPSec user group name will also be available for use in various configuration menus.

### Filters




The **Filters** function allows you to filter *networks* or hosts with specific attributes from the table. This function considerably enhances the management of huge networks, as networks of a certain type can be presented in a concise way.

**Filtering networks**:

**1.** Click on the **Filters** button.

The entry window will open.

**2.** Enter the filter attributes in the fields listed. You don't have to define all attributes.

**Name**: If you want to filter the networks by names, enter the expression in the entry menu.

**Type**: Use this drop-down menu to filter the networks of a specific type.

**Address Values**: If you wish to filter networks by specific addresses, enter the IP address in this entry field.

**3.** To start the filter, click on the **Apply Filters** button.

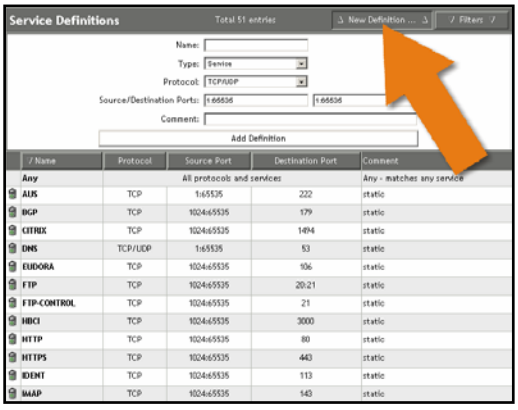
Only the filtered networks will be displayed in the table. Next time when you open the menu, the complete network table will be displayed.

### Further Functions

**Editing Definitions**: Click on the settings in the **Name**, **Value** and **Comment** columns in order to open an editing window. You can then edit the entries.

**Deleting Definitions**: Clicking on the symbol of the trash will delete the definition from the table.

### 4.2.2. Services




The **Services** menu is used to define the Services and Service Groups.

**Services** define certain types of traffic over networks like the Internet. A service is defined by a **name**, a **protocol**, and **ports**.

The following protocols can be used: *TCP*, *UDP*, *TCP/UDP*, *ICMP*, *ESP*, *AH* and *IP*.

**UDP** uses port numbers between 0 and 65535 (inclusive) and is a stateless protocol that uses no so-called ACK-Bit. Because it does not keep state, UDP can be faster than **TCP**, especially when sending small amounts of data. This statelessness, however, also means that **UDP** cannot recognize when packets are lost or dropped. The receiving computer does not signal the sender when it receives packets successfully.

*TCP* connections also use port numbers from 0 to 65535 (inclusive). Lost packets can be recognized through *TCP* and be requested again. in a *TCP* connection, the receiver notifies the sender when a packet is successfully received (connection related protocol). *TCP* sessions begin with a **three way handshake** and are torn-down at the close of the session.

The **ESP** and **AH** protocols are used for **Virtual Private Networking** (**VPN**). These protocols are covered in chapter 4.7 on page 220.

The network table contains the defined services and groups. By Default, the table contains the already pre-defined statically entered services.

**Services** can be grouped into **Service Groups**. These service groups can be used the same way single services can, and can themselves be included in other service groups. In the service table service groups are labeled by the group symbol ( ).
The definition of *Service Groups* is described on page 87.

**Add Service:**

1. Under the **Definitions** tab, open the **Service** menu.
2. Click on the **New Definition** button.

   The entry window will open.
3. Make the following settings:

   **Name**: In the entry field, enter a unique **Service** name.

   > This name will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

   **Type**: Select **Service** from the drop-down menu.

   **Protocol**: Select the **Protocol** from the drop-down menu.

   **Source/Destination Ports**: In the left entry menu, enter the Source Port, that is the Client Side of the service. In the right entry menu, enter the Destination Port, that is the Server Side of the service.
4. The other settings depend on the selected protocol:

   For the **TCP** and **UDP** protocols you need the following two values. Entry options: A single port (e.g., 80) or a port range (e.g., 1024:64000).

   **Source/Destination Ports**: In the left-hand entry menu, enter the Source Port, i.e. the Client Side of the service. In the right hand entry menu, enter the Destination Port, i.e. the Server Side of the service.

   The **ESP** and **AH** protocols are used for **IPsec VPN** connections. The port entered here should be agreed upon with the remote end of the IPSec VPN tunnel.

   **SPI**: Enter a value from 256 to 65535. Values up to and including 255 are reserved by the **Internet Assigned Numbers Authority (IANA).**

   For the **ICMP** protocol, select a type of ICMP packet from the **ICMP type** drop-down menu.

   For the **IP** protocol enter the protocol number into the **Protocol Number** entry field.

   **Comment**: You can enter a service description in this entry field.
5. Save the **Services** by clicking on the **Add Definition** button.

After successful definition, the new service will appear in the service table.

**Defining Service Group:**

1. Under the **Definitions** tab, open the **Service** menu.
2. Click on the **New Definition** button.

   The entry window will open.
3. Make the following settings:

   **Name**: In the entry field, enter a unique **Service Group** name.

   > This name will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

   **Type**: Select **Service Group** from the drop-down menu.

   **Initial Members**: From the selection field, select the services by pressing the **Ctrl**-key on the keyboard and selecting the name with the mouse.
4. Save the **Service Group** by clicking on the **Add Definition** button.

After successful definition, the new service group will appear in the service table.

#### Filters

The **Filters** function allows you to filter *Services* with specific attributes from the table. This function considerably enhances the management of networks with many services, as services of a certain type can be presented in a concise way.

**Filtering services:**

1. Click on the **Filters** button.

   The entry window will open.
2. Enter the filter attributes in the fields listed. You don't have to define all attributes.

   **Name**: If you want to filter the services by names, enter the expression in the entry menu.

   **Protocol**: This drop-down menu allows you to filter the services by specific protocols.

   **Source Port**: If you want to filter services by a specific source port, enter it in this entry field.

   **Destination Port**: If you want to filter services by a specific target port, enter it in this entry field.

   **Comment**: If you want to filter services by specific comments, enter the expressions in this entry field.

3. To start the filter, click on the **Apply Filters** button.

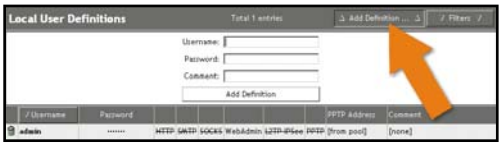
Only the filtered services will be displayed in the table. Next time when you open the menu, the complete service table will be displayed.

**Further Functions**

**Editing Definitions**: Click on the settings in the **Name**, **Value** and **Comment** columns in order to open an editing window. You can then edit the entries.

**Deleting Definitions**: Clicking on the symbol of the trash will delete the definition from the table.

### 4.2.3. Users




In the **Users** menu **Local Users** are added, if the use of proxy services should be limited to sepcial persons. This is an alternative to using an external user database. This menu allows you to define which user has access to which proxy services. Available options are **HTTP**-Proxy, **SMTP**-Proxy, **SOCKS**-Proxy, **WebAdmin**, **L2TP over IPSec** and **PPTP** (Remote Access).

**Security Note:**

Normally, only the **admin** user has access to **WebAdmin**. The password to *WebAdmin* should be changed at regular intervals.

**Add Local Users:**

1. Under the **Definitions** tab, open the **Users** menu.
2. Click on the **New Definition** button.

   The entry window will open.
3. Make the following settings:

   **Username**: In the entry field, enter a unique username for the local user.

   > This username will be used later, for example to configure packet filter rules. Allowed characters are: The only allowed characters are alphanumeric characters, minus (-), space ( ), and underscore (_). Names may be up to 39 characters long.

   **Password**: Enter a password here.

**Security Note:**

Use a secure password! Your name spelled backwards is, for example, not a secure password – while something like xfT35$4 would be.

**Comment**: You can enter a local user description in this entry field.

4. Save the **Local User** by clicking on the **Add Definition** button.

   The new *User* will then be displayed in the table.

5. In the table, enable the services for the **Local User**.

   At the beginning, no services are enabled for the user. Enable the services, by clicking on the corresponding term.

   **Example**:

   ~~HTTP~~ = the HTTP Proxy is not enabled

   HTTP = the HTTP Proxy is enabled

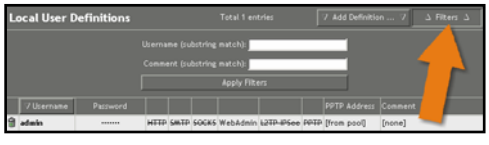
   The available services are: **HTTP** Proxy, **SMTP** Proxy, **SOCKS** Proxy, **WebAdmin**, **L2TP over IPSec** and **PPTP** (Remote Access).

   **PPTP Address**: In PPTP connections also a static IP address can be assigned to a remote host instead of a dynamic address from a PPTP IP pool. In order to define a static IP, click on the field in the *PPTP Address* column and enter the address in the entry field.

   Click the **Save** button to save your changes. In order to interrupt this process, click on the **Cancel** button.

   For more information on **PPTP VPN Access**, please refer to chapter 4.3.7 on page 133.

#### Filters




The **Filters** function allows you to filter *Users* with specific attributes from the table. This function considerably enhances the management of huge network configurations, as users of a certain type can be presented in a concise way.

**Filtering users**:

1. Click on the **Filters** button.

   The entry window will open.

2. Enter the filter attributes in the fields listed. You don't have to define all attributes.

   **Username**: If you want to filter the users by username, enter the expression in the entry field.

**Comment**: If you want to filter users by specific comments, enter the expressions in this entry field.

3. To start the filter, click on the **Apply Filters** button.

Only the filtered users will be displayed in the table. Next time when you open the menu, the complete user table will be displayed.

**Further Functions**

**Editing Local Users**: Click on the settings in the **Name**, **Password**, **PPTP Address** and **Comment** columns in order to open an editing window. You can then edit the entries.

**Deleting Local Users**: Clicking on the symbol of the trash can will delete the definition from the table.

#### 4.2.4. Time Events

The **Time Events** menu is used to define **single** or **recurring** time intervals.

These defined *Time Events* can be used with the following modules:

- In the **Packet Filter** the rules for the data traffic for specific time intervals can be defined.
- In the **Content Filter** (**Surf Protection**) time intervals for the access to the HTTP-proxy can be assigned in the **Profile Assignment** table.

Two *Time Event* types can be defined:

- **Recurring**: The defined time interval will be repeated periodically. The beginning and the end are defined through time indications. The periodic interval is defined through the indication of the weekdays.
- **Single**: The defined time interval will only take place once. The beginning and the end are defined through date and time indications. Weekdays may also be defined.

**Defining a Time Event**:

4. Open the **Time Events** menu in the **Definitions** tab.
5. Then click on the **New event definition** button.

   Then a new line will be displayed in the table.
6. Make the following settings:

   **Name**: Enter a descriptive service name in the **Time Event** field.

   > This name will be used later, for example, to configure packet filter rules. Allowed characters are: Letters of the alphabet, numbers from

> 0 to 9, minus, space, and underscore characters. The name may be up to 39 characters long.

**Type**: Use the drop-down menu to select a type.

**Start Time**: Here, you can define the beginning of the interval. Clicking on the field opens an entry window.

**Stop Time**: Here, you can define the end of the interval. Clicking on the field opens an entry window.

**Weekdays**: Configure the weekdays, for which the time interval is designed for, for the Recurring time interval type. When you click on this field, the option windows for the selection of the weekdays will be displayed.

The new definition will immediately be active and can be selected in the modules with a corresponding Time-Event-function.

#### Further Functions

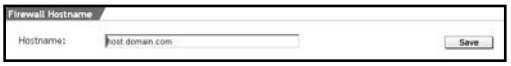
**Deleting a Time Event**: Clicking on the trash can icon deletes a definition from the table.

## 4.3. Network Settings (Network)

The **Network** tab contains menus which allow you to configure **network cards** and **virtual interfaces**, as well as to perform network-specific configuration and management tasks.

### 4.3.1. Hostname/DynDNS

#### Firewall Hostname




**Hostname**: Enter the hostname for the Security Manager in this entry field. Example: firewall.mydomain.com

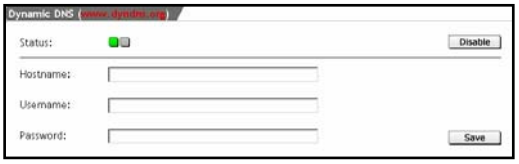
A Hostname or domain name may contain alphanumeric, period and minus characters. At the end there must be an alphabetic designator, such as „com", „de" or „org". The **Hostname** will appear in the subject line of all **Notification E-Mails**.

Save your entries by clicking the **Save** button.

**Note:**

The **Hostname** will appear in the subject line of all **Notification E-Mails** to the Administrator.

#### Dynamic DNS




**Dynamic DNS** addresses a device or a VPN receiver through a DNS decryptable name. The respective applicable IP address is stored for each name to a public DNS server in the Internet at each connection. The device can always be reached through this name - as long as it online, at least. A mobile user, for example can access his company network through Dynamic DNS, even if the company only uses standard DSL connections with dynamic IP addresses. In addition to VPN applications, *Dynamic DNS* can also be used for remote maintenance and control.

**Defining Dynamic DNS Servers**:

1. In the **Network** tab, open the **Hostname/DynDNS** menu.
2. Enable the function by clicking on the **Enable** button in the **Status** column.

   The entry window will open.

3. Make the following settings:

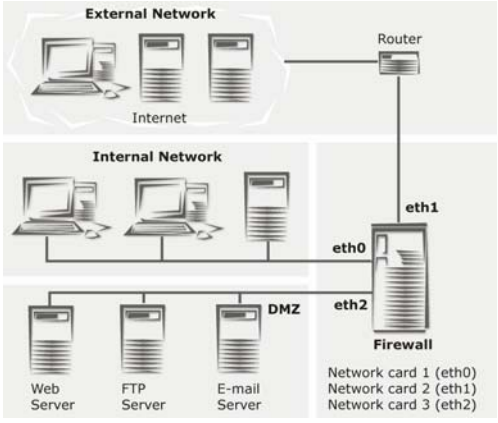
   **Hostname**: In the entry field, enter the hostname.

   **Username**: In the entry field, enter the username.

   **Password**: In the entry field, enter the password.

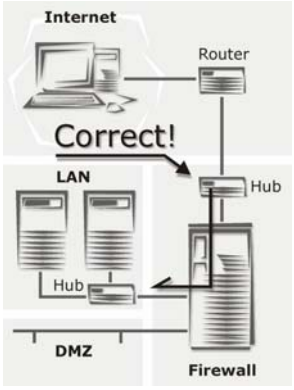
4. Save your settings by clicking on the **Save** button.

### 4.3.2. Interfaces

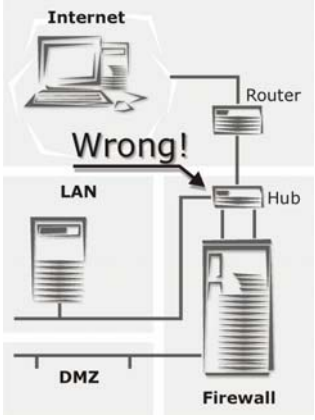



A firewall requires at least two **network cards** in order to securely connect an internal network (LAN) to an external one (the Internet). In our examples, the **Network card eth0** is always the interface connected to the internal network. **Network card eth1** is the interface connected to the external network (e.g., to the Internet). These interfaces are also called the **trusted** and **untrusted** interfaces, respectively.

Network cards are automatically recognized during the installation: if new network cards are added later, a new installation will be necessary. In order to re-install the system, simply make a backup of your configuration, install a new copy of the software, and re-load your backed-up configuration.




As is shown in the graphic at left, the firewall must be the only point of contact between internal networks and external ones. All data must pass through the Security Manager.




We strongly recommend against connecting both internal and external interfaces to one hub or switch – except if the switch is configured as a VLAN switch. There might be wrong ARP resolutions (Address Resolution Protocol) (ARP clash), which cannot be administered by all operating systems (such as those from Microsoft). Therefore, one physical network segment has to be used for each firewall network interface.

The **Interfaces** menu allows you to configure and manage all network cards installed on Novell Security Manager and also all interfaces with the external network (Internet) and interfaces to the internal networks (LAN, DMZ).

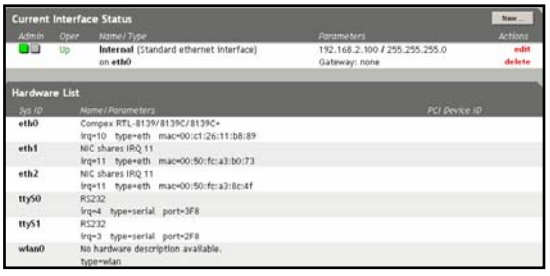
**Note:**

While planning your network topology and configuring Novell Security Manager, take care to note which interface is connected to which network. In most configurations, the network interface with SysID **eth1** is chosen as the connection to the external network.

In order to install the **High Availability (HA)** system, the selected network cards on both systems must have the same SysID. Installing the **HA** system is described in more detail in chapter 4.1.10 on page 74.

The following sections explain how to use the **Current Interface Status** and **Hardware List** windows to manage the various **Interface types**.

### Current Interface Status




This window allows you to configure both, logical and virtual **interfaces**. The table lists all interfaces which have already been configured. The graphic at left shows the **Interfaces** menu after three Ethernet network cards have been configured.

During the installation, you will have configured the **eth0** interface. This interface is the connection between Novell Security Manager and the internal network (LAN). By default, this network card is named **Internal**. The table displays all of the most important information about the interfaces: the administrative status (enabled/disabled, indicated by a **green** or **red** status light), current connection status (**Up**/**Down**), Name (**Name**), ID (**Sys ID**), network card type (**eth**/ **wlan**) as well as IP address and network mask (**Parameters**).

Click the status light in the **Admin** column to administratively enable or disable the interface. The functions in the **Actions** column allow you to **edit** the configuration of the interface, or to **delete** it entirely.

With Novell Security Manager, you assign one **Name** and also a specific network card to one virtual interface. Three logical networks will then be defined for each configured interface:

- An interface (**NAME (Address)**), consisting of the defined IP address and the network mask 255.255.255.255 (Host)

- An interface (**NAME (Network)**), consisting of the defined IP address and the network mask 255.255.255.255 (Network)
- A Broadcast (**NAME (Broadcast)**) network, consisting of the broadcast IP for this interface and the network mask 255.255.255.255 (Host)

The networks are shown in the **Networks** menu. If an interface is configured using a dynamic addressing scheme, for example through **DHCP** or **PPPoE**, these settings are automatically updated. This means that all functions (for example, packet filter rules) configured with these aliases will automatically use the correct addresses.

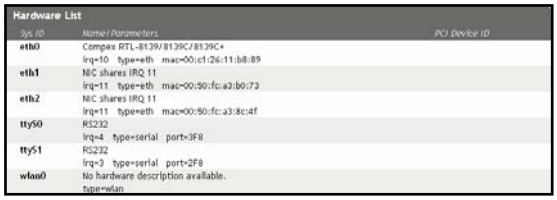
#### Transparent (Bridging) Mode

Through the **Transparent (Bridging) Mode** function, all configured network cards will be removed and a Bridge interface will be defined. This interface contains the address from the network card with the default gateway. If there is no default gateway, the security system uses the first IP address, which had been defined on an Ethernet-network card.

The **Transparent (Bridging) Mode** function is a simplified version of the **Bridging** function in the **Network/Interfaces** menu. For more information, please, refer to chapter 4.3.3 on page 119.

You can switch back to the **Routing Mode**, by clicking once again on the **Start** button. Then the bridge will be changed to a *Standard Ethernet Interface*. This interface contains all address settings of the *bridge*.

#### Hardware List




This table lists all network cards and serial interfaces installed on Novell Security Manager, together with the relevant hardware information. The table shows, for example, the system-assigned ID (**Sys ID**), type of network card, hardware (MAC) address (**Name/Parameters**), and PCI bus information: Bus/ Device/Function (**PCI Device ID**).

PPP modems, which are based on the serial console can be connected to the serial interface. For more information on configuring the serial interface with a PPP modem, please see chapter 4.3.2.6 on page 115.

---

**Error:**

The **Hardware List** table doesn't list all of the network cards.

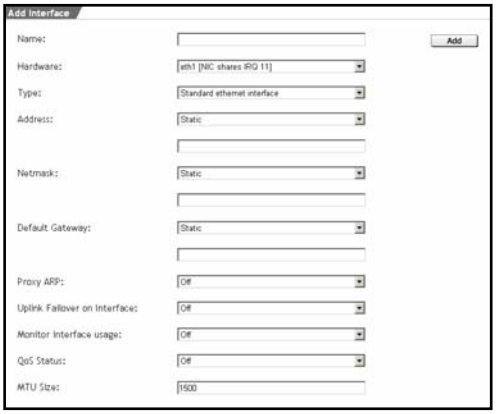
**Possible Causes:**

The missing network cards were added after the installation of Novell Security Manager, or were not recognized during installation. Please contact the support department of your Security Manager provider.

**Attention:**

If you change the **IP Address** of the internal network card (**eth0**), you may lock yourself out.

#### 4.3.2.1. Standard Ethernet Interface




To configure a network card for a standard Ethernet connection to an internal or external network, you must configure the card with an IP address and netmask.

All network cards installed on Security Manager are shown in the **Hardware List**.

**Configuring a Standard Ethernet Connection**:

1. In the **Network** tab, open the **Interfaces** menu.
2. Click on the **New** button.

   The **Add Interface** window will open.
3. In the **Name** entry field, enter a descriptive name for the interface. (example: **Externally** for an Internet connection)
4. Use the **Hardware** drop-down menu to select a network card.

**Tip:**

For an external connection (e.g., to the Internet) choose the card with Sys ID **eth1**.

5. Use the drop-down menu **Type** to select **Standard Ethernet Interface**.

   Please note that one network card cannot be used as both a **Standard ethernet interface** and a **PPP over Ethernet (PPPoE-DSL)** or **PPPTP over Ethernet (PPPoA-DSL) connection** simultaneously.
6. Now make the specific settings for this interface type:

   **Address**: If you wish to use a static IP address for this interface, select **Static** from the drop-down menu and enter the address to use in the entry field. If you wish to have a gateway dynamically assigned via DHCP, select **Assign by DHCP** from the drop-down menu.

**Important Note:**

If you wish to configure the **Uplink Failover on Interface** function, observe the description of this function while entering the network!

**Netmask**: If you wish to use a statically defined network mask for this interface, use the drop-down menu to select **Static** and enter the

netmask to use in the entry field. If you wish to have a netmask dynamically assigned via DHCP, select **Assign by DHCP** from the drop-down menu.

**Default Gateway**: If you wish to use a statically defined default gateway, use the drop-down menu to select **Static** and enter the address of the gateway in the entry field. If you wish to have a gateway dynamically assigned via DHCP, select **Assign by DHCP** from the drop-down menu. Otherwise, select **None**.

**Proxy ARP**: When this function is enabled, Novell Security Manager will answer ARP requests on the selected interface for all known networks. This system will thus act as a proxy on this interface for all of the other directly-connected networks.
This function is only required in special cases, for example when an attached network cannot be configured with normal routing entries (e.g., when the network includes a router over which you have no control).
By default, the **Proxy ARP** function is disabled (**Off**). To enable it, select **On** from the drop-down menu.

**Uplink Failover on Interface**: This function will only displayed, if the parameter **Assign by DHCP** or **Static** has been selected in the **Default Gateway** drop-down menu.

If a network card is an interface to the Internet (e.g., 2 Megabit fixed connection) you can configure a standby connection by a second Internet access (e.g., DSL connection) and an additional network card. If the primary connection fails, the uplink will automatically be set up through the backup Internet access. In order to monitor the connection, the P*rimary Interface* sends four ping requests to the **Uplink Failover check IP** every five seconds. Only if all four ping requests are not replied to, the Backup Interface is loaded.
When the Internet connection is established via the *Backup Interface* the ping requests are still sent by the *Primary Interface*. As soon as the Security Manager receives the corresponding reply packages to the ping requests again, the Internet connection is again established by the *Primary Interface*.

**Important Note:**

When the **Uplink Failover on Interface** function is used, two different networks must be defined on the *Primary* and *Backup Interface*. Therefore you need two separate Internet accesses next to the additional network card.

**Uplink Failover on Interface** is by default disabled (**Off**). If you wish to use this network card as primary Internet connection, then configure it in the **Primary Interface** drop-down menu. If this net-

work card shall contain the standby connection, select the setting **Backup Interface**.

**Uplink Failover check IP**: This entry field will be displayed if the **Primary Interface** setting has been selected for the **Uplink Failover on Interface** function. Enter the IP address of a host here, which replies to the ICMP Ping requests and which, in addition to that, is always reachable! Novell Security Manager will send ping requests to this host: if no answer is received, the backup interface will be enabled by the failover. In this entry field, there must always be an IP address for the failover!

**Monitor Interface Usage**: This function monitors the bandwidth on the interface. Once, the bandwidth falls short of or exceeds a specific value, a notification e-mail will be sent to the administrator.

The maximum available bandwidth must be entered for the Monitor Interface Usage function into the **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)** entry fields. The notification e-mail to the administrator will be sent, as soon as the actually available bandwidth falls off or exceeds a predefined limit value. The limit values are configured with the **Notify** drop-down menus.
The settings will only be displayed once the Monitor Interface Usage function is enabled (**On**).

**QoS Status**: In order to use **Quality of Service (QoS)** bandwidth management on an interface, enable this option. To enable the **Quality of Service (QoS)** function, select **On** from the drop-down menu.

---

**Important Note:**

For the bandwidth management **Quality of Service (QoS)** you must define the values for **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)**. These values are used as basis for the bandwidth management system: incorrect values can lead to poor management of the data flow. The **Quality of Service (QoS)** function is described in chapter 4.5.1.

---

**Uplink Bandwidth (kbits)**: This setting will only appear, if the **QoS** or **Monitor Interface Usage** function is enabled. In this entry menu, enter the available bandwidth for the Uplink in full kilobits. This value can be determined either from the values of the upstream interface or from the router. On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection - on an ADSL access the Uplink bandwidth amounts to 128 kBit/s and on a 2-Megabit fixed connection to 2048 kBit/s.

**Downlink Bandwidth (kbits)**: This setting will only appear, if the **QoS** or **Monitor Interface Usage** function is enabled. In this entry menu, enter the available bandwidth for the Downlink in full kilobits.

On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection - on an ADSL access the Downlink bandwidth amounts to 768 kBit/s and on a 2-Megabit fixed connection to 2048 kBit/s.

**Notify when uplink usage below (%)**: This setting will only be displayed, when the **Monitor Interface Usage** function is enabled. Use the drop-down menu to configure the lower threshold for the uplink.

**Notify when uplink usage exceeds (%)**: This setting will only be displayed, when the **Monitor Interface Usage** function is enabled. Use the drop-down menu to configure the upper threshold for the uplink.

**Notify when downlink usage below (%)**: This setting will only be displayed, when the **Monitor Interface Usage** function is enabled. Use the drop-down menu to configure the lower threshold for the downlink.

**Notify when downlink usage exceeds (%)**: This setting will only be displayed, when the **Monitor Interface Usage** function is enabled. Use the drop-down menu to configure the upper value for the downlink.

**MTU Size**: The **MTU** is the size (in bytes) of the largest transmittable packet. **MTU** stands for **Maximum Transfer Unit**. For connections, using the TCP/IP protocol, the data will be grouped into packets. A maximum size will be defined for these packets. Packets larger than this value will be considered too long for the connection and fragmented into smaller ones before transmission. These data packets will be sent again. However, the performance can be limited, if the upper value is too low.

The largest possible MTU for an Ethernet interface is 1500 Bytes.

The following value is the default for the **Standard Ethernet Interface**: 1500 Byte.

**7.** Confirm these settings by clicking **Add**.

The system will now check the address and network mask for semantic validity. After a successful check, the new **interface** will appear in the **Current Interface Status** table. The interface is not yet enabled (status light is red).

**8.** Enable the interface by clicking the status light.

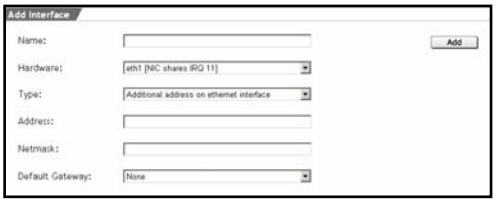
The interface is now enabled (status light shows green). The **Oper** column will at first show that the interface is **Down**: the system requires a short time to configure and load the settings.

9. Click the **Refresh** button to load the menu again.

   Further information about the **Refresh** function can be found in chapter 3.5 on page 31.

When the message **Up** appears, the interface is fully operational. The network card settings are displayed in the **Parameters** column.

#### 4.3.2.2. Additional Address on Ethernet Interface




One network card can be configured with multiple additional IP addresses (also called IP aliases). This function allows you to manage multiple logical networks on one physical network card. It can also be used to assign further addresses to a security device running **NAT**. **NAT** is described in further detail in chapter 4.3.5 on page 123. Each network card can be configured with up to 255 additional addresses.

**Adding additional addresses to a network card**:

1. In the **Network** tab, open the **Interfaces** menu.
2. Click on the **New** button.

   The **Add Interface** window will open.
3. In the **Name** entry field, enter a descriptive name for the interface.
4. Use the **Hardware** drop-down menu to select a network card.
5. Use the **Type** drop-down menu to select **Additional address on Ethernet interface**.
6. Now make the specific settings for this interface type:

   **Address**: For this interface type, the address must be statically defined. This kind of interface can only use static addresses.

   **Netmask**: This interface type requires a statically defined netmask. This kind of interface can only use static masks.

   **Default Gateway**: If you wish to use a default gateway with this interface, select **Static** from the drop-down menu and enter the gateway address in the entry field. Otherwise, select **None**.
7. Confirm these settings by clicking **Add**.

   The system will now check the address and network mask for semantic validity. After a successful check, the new **interface** will appear in the **Current Interface Status** table. The interface is not yet enabled (status light is red).
8. Enable the interface by clicking the status light.

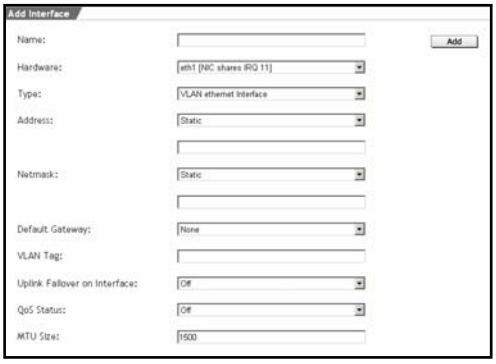
The interface is now enabled (status light shows green). The **Oper** column will at first show that the interface is **Down**: the system requires a short time to configure and load the settings.

**9.** Click the **Refresh** button to load the menu again.

Further information about the **Refresh** function can be found in chapter 3.5 on page 31.

When the message **Up** appears, the interface is fully operational. The network card settings are displayed in the **Parameters** column.

#### 4.3.2.3. Virtual LAN



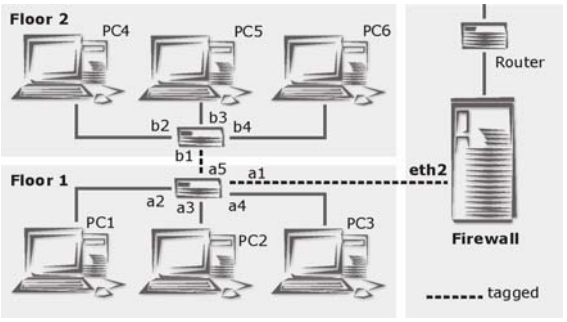

**Virtual LAN (VLAN)** technology allows a network to be segregated into multiple smaller network segments at the Ethernet level (layer 2). This can be useful, for instance, when security considerations require that certain clients only be allowed to communicate with certain other ones. In large networks, this can also be useful to connect physically separate clients on the same logical network segment.

A VLAN-capable switch can assign ports to distinct groups. For example, a 20 port switch could assign ports 1 through 10 to VLAN 1, and ports 11 through 20 to VLAN 2. With such a configuration, a computer on port 1 would not be able to communicate with a computer on port 11. The technology essentially allows one physical switch to be divided into two logical ones.

In order to connect the Security Manager to the virtual LANs, the system requires a network card with a **tag**-capable driver. A tag is a 4-byte header attached to packets as part of the Ethernet header. The tag contains the number of the VLAN that the packet should be sent to: the VLAN number is a 12-bit number, allowing up to 4095 virtual LANs. The WebAdmin tool refers to this number as the **VLAN Tag**.

The tagged packets are only used to communicate between the VLAN-compatible switch and the Security Manager, the other computers on the network do not need to have tag-compatible network cards. The port on the switch connected to Security Manager must also be configured as an **untagged port**. Most VLAN-compatible switches can be configured by using a terminal program over a serial interface.

**Example configuration**:




The graphic at left shows an office where computers are distributed across two floors. Each floor has a separate switch, and each computer is connected to the switch on its floor. In this configuration, PC1 and PC2 on the first floor and PC4 on the second floor will be connected together on VLAN 10. PC3, PC5 and PC6 will be connected together on VLAN 20.

The two switches must be configured as follows:

Switch a

| Port | VLAN Tag | tagged/ untagged |
|---|---|---|
| 1 | 10, 20 | T |
| 2 (PC1) | 10 | U |
| 3 (PC2) | 10 | U |
| 4 (PC3) | 20 | U |
| 5 | 10,20 | T |

Switch b

| Port | VLAN Tag | tagged/ untagged |
|---|---|---|
| 1 | 10, 20 | T |
| 2 (PC4) | 10 | U |
| 3 (PC5) | 20 | U |
| 4 (PC6) | 20 | U |

In this configuration, it seems to PC3 as though it were connected through a single switch to PC5 and PC6.

In order to connect the computers to an external network (e.g., the Internet), the interface on Novell Security Manager (in the example, this is eth2) must be configured to support the VLANs.

**Attention:**

In order to configure a **Virtual LAN** interface, you will need a network card with a **tag**-capable driver. The hardware supported by Novell Security Manager is listed in the **Hardware Compatibility List for Novell Security Manager powered by Astaro** available at **http://www.novell.com/documentation/nsma51**.

**Configuring a Virtual LAN**:

1. In the **Network** tab, open the **Interfaces** menu.
2. Click on the **New** button.

   The **Add Interface** window will open.
3. In the **Name** entry field, enter a descriptive name for the interface.
4. Use the **Hardware** drop-down menu to select a network card.

5. Use the drop-down menu **Type** to select **VLAN Ethernet interface**.

6. Fill in the required settings for the **VLAN Ethernet Interface** type of interface:

   **Address**: Assign an IP address for the virtual interface. If you wish to use a static IP address for this interface, select **Static** from the drop-down menu and enter the address to use in the entry field. If you wish to have a gateway dynamically assigned via DHCP, select **Assign by DHCP** from the drop-down menu.

   **Netmask**: If you wish to use a statically defined network mask for this interface, use the drop-down menu to select **Static** and enter the netmask to use in the entry field. If you wish to have a netmask dynamically assigned via DHCP, select **Assign by DHCP** from the drop-down menu.

   **Default Gateway**: If you wish to use a statically defined default gateway, use the drop-down menu to select **Static** and enter the address of the gateway in the entry field. If you wish to have a gateway dynamically assigned via DHCP, select **Assign by DHCP** from the drop-down menu. Otherwise, select **None**.

   **VLAN Tag**: Enter the VLAN tag to use for this interface.

   **QoS Status**: In order to use **Quality of Service (QoS)** bandwidth management on an interface, enable this option. To enable the **Quality of Service (QoS)** function, select **On** from the drop-down menu.

   ---

   **Important Note:**

   For the bandwidth management **Quality of Service (QoS)** you must define the values for **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)**. These values are used as basis for the bandwidth management system: incorrect values can lead to poor management of the data flow. The **Quality of Service (QoS)** function is described in chapter 4.5.1.

   ---

   **Uplink Bandwidth (kbits)**: This setting will only appear, if the QoS function is enabled. In this entry menu, enter the available bandwidth for the Uplink in full kilobits. This value can be determined either from the values of the upstream interface or from the router.

   **Downlink Bandwidth (kbits)**: This setting will only appear, if the QoS function is enabled. In this entry menu, enter the available bandwidth for the Downlink in full kilobits.

   **MTU Size**: The **MTU** is the size (in bytes) of the largest transmittable packet. **MTU** stands for **Maximum Transfer Unit**. For connections, using the TCP/IP protocol, the data will be grouped into packets. A maximum size will be defined for these packets. Packets larger than this value will be considered too long for the connection and frag-

mented into smaller ones before transmission. These data packets will be sent again. However, the performance can be limited, if the upper value is too low.

The largest possible MTU for an Ethernet interface is 1500 Bytes.

The following values are the defaults for the **VLAN Ethernet Interface**: 1500 Byte.

**7.** Confirm these settings by clicking **Add**.

The system will now check the address and network mask for semantic validity. After a successful check, the new **interface** will appear in the **Current Interface Status** table. The interface is not yet enabled (status light is red).

**8.** Enable the interface by clicking the status light.

The interface is now enabled (status light shows green). The **Oper** column will at first show that the interface is **Down**: the system requires a short time to configure and load the settings.

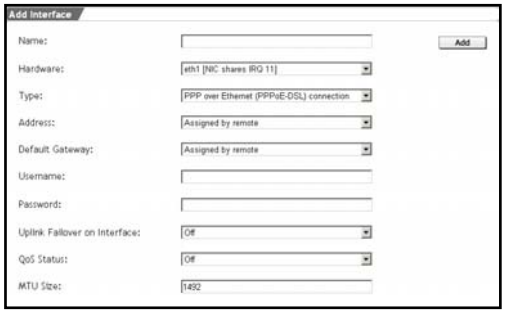
**9.** Click the **Refresh** button to load the menu again.

Further information about the **Refresh** function can be found in chapter 3.5 on page 31.

When the message **Up** appears, the interface is fully operational. The network card settings are displayed in the **Parameters** column.

The new virtual interface will appear in the **Hardware Device Overview** just as an additional IP address (IP alias) on a standard Ethernet network card would. The **Sys ID** of this virtual interface is composed of the SysID of the network card and the number of the VLAN tag.

#### 4.3.2.4. PPPoE-DSL Connection




This interface type is used to connect to the Internet over a **DSL** connection using the **PPP over Ethernet** protocol. The configuration will require the DSL connection information, including username and password, provided by your Internet Service Provider.

**Note:**

The installation and specific settings required for **DSL** connections is described in the **DSL Network** guide. Also note that, once the DSL connection is activated, Novell Security Manager will be connected to your ISP 24 hours a day. You should therefore ensure that your ISP bills on a flat-rate or bandwidth-based system rather than based on connection time.
The **DSL Network** guide is available at **http://www.novell.com/documentation/nsma51**.

**Configuring PPP over Ethernet (PPPoE-DSL)**:

1. In the **Network** tab, open the **Interfaces** menu.
2. Click on the **New** button.

   The **Add Interface** window will open.
3. In the **Name** entry field, enter a descriptive name for the interface.
4. Use the **Hardware** drop-down menu to select a network card.

   **Tip:**

   For an external connection (e.g., to the Internet) choose the card with Sys ID **eth1**.

   You cannot choose a network card that has already been configured with a primary network address.
5. Use the **Type** drop-down menu to select the **PPP over Ethernet (PPPoE-DSL) connection** interface type.

   You will need the connection settings provided by your ISP to configure the following settings.

   **Address**: If you have not been assigned a static IP address by your provider, keep the default **Assigned by remote** setting here. If you have a static IP address, choose **Static** from the drop-down menu and enter the address in the entry field.

**Important Note:**

If you wish to configure the **Uplink Failover on Interface** function, observe the description of this function while entering the network!

**Default Gateway**: You should probably keep the default setting **Assigned by remote**. Other possible values are **Static** and **None**.

**Username**: Enter the user name, provided by your ISP.

**Password**: Enter the password, provided by your ISP.

**Uplink Failover on Interface**: This function will only be displayed if the **Assigned by remote** or **Static** is selected in the **Default Gateway** drop-down menu.

You can setup a failover on an interface to the Internet with the help of a second Internet access and an additional network card. Please, remember in doing so that Novell Security Manager supports only one DSL connection. A failover for the Internet access can, for example, consist of a permanent communication line and a DSL access! If the primary connection fails, the Uplink will automatically be performed by the second Internet connection. In order to monitor the connection, the *primary network card* sends four ping requests to the **Uplink Failover check IP** every five seconds. Only if all four ping requests are not replied to the Backup Interface is loaded.
When the Internet connection is established via the *Backup Interface*, the ping requests are still sent by the *Primary Interface*. As soon as the Security Manager receives the corresponding reply packages again, the Internet connection is again established by the *Primary* Interface.

**Important Note:**

When the **Uplink Failover on Interface** function is used, two different networks must be defined on the *Primary* and *Backup Interface*. Therefore you need next to the additional network card for the Backup Interface two separate Internet accesses.

**Uplink Failover on Interface** is by default disabled (**Off**). If you wish to use this virtual interface as primary connection, select **Primary Interface** from the drop-down menu. If this interface shall contain the standby connection, select the **Backup Interface** configuration.

**Uplink Failover check IP**: This entry field will be displayed if the **Primary Interface** setting has been selected for the **Uplink Failover on Interface** function. Enter the IP address of a host here, which replies to the ICMP Ping requests and which, in addition to that, is always reachable! The Security Manager will send ping requests to this host: if no answer is received, the *backup interface* will be enabled by

the failover. In this entry field, there must always be an IP address for the failover!

**QoS Status**: In order to use **Quality of Service (QoS)** bandwidth management on an interface, enable this option. To enable the **Quality of Service (QoS)** function, select **On** from the drop-down menu.

---

**Important Note:**

For the bandwidth management **Quality of Service (QoS)** you must define the values for **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)**. These values are used as basis for the bandwidth management system: incorrect values can lead to poor management of the data flow. The **Quality of Service (QoS)** function is described in chapter 4.5.1.

---

**Uplink Bandwidth (kbits)**: This setting will only appear, if the QoS function is enabled. In this entry menu, enter the available bandwidth for the Uplink in full kilobits. This value can be determined either from the values of the upstream interface or from the router. On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection - on an ADSL access the Uplink bandwidth amounts to 128 kBit/s and on a 2-Megabit fixed connection to 2048 kBit/s.

**Downlink Bandwidth (kbits)**: This setting will only appear, if the QoS function is enabled. In this entry menu, enter the available bandwidth for the Downlink in full kilobits. On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection - on an ADSL access the Uplink bandwidth amounts to 768 kBit/s and on a 2-Megabit fixed connection to 2048 kBit/s.

**MTU Size**: The **MTU** is the size (in bytes) of the largest transmittable packet. **MTU** stands for **Maximum Transfer Unit**. For connections, using the TCP/IP protocol, the data will be subdivided into packets. A maximum size will be defined for these packets. Packets larger than this value will be considered too long for the connection and fragmented into smaller ones before transmission. These data packets will be sent again. However, the performance can be limited, if the upper value is too low.

The following values are the defaults for the **PPP over Ethernet (PPPoE-DSL) connection**: **1492** Byte.

6. Confirm these settings by clicking **Add**.

   The system will now check the address and network mask for semantic validity. After a successful check, the new **interface** will appear in the **Current Interface Status** table. The interface is not yet enabled (status light is red).

7. Enable the interface by clicking the status light.

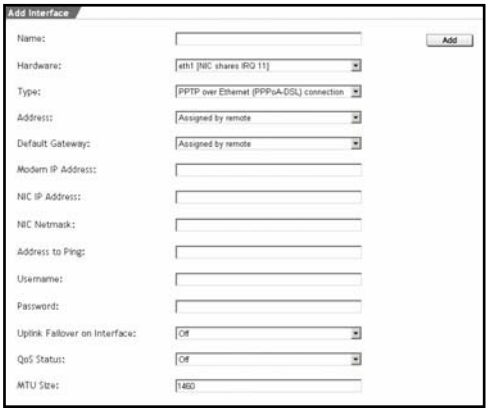
   The interface is now enabled (status light shows green). The **Oper** column will at first show that the interface is **Down**: the system requires a short time to configure and load the settings.

8. Click the **Refresh** button to load the menu again.

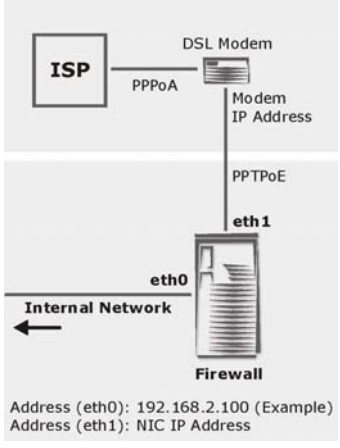
   Further information about the **Refresh** function can be found in chapter 3.5 on page 31.

When the message **Up** appears, the interface is fully operational. The network card settings are displayed in the **Parameters** column.

#### 4.3.2.5. PPTPoE/PPPoA-DSL Connections




This type of interface is required for **DSL** connections using the **PPP over ATM** protocol. To configure such a connection, you will need an unused Ethernet interface on the Security Manager as well as an ADSL modem with an Ethernet port. The connection to the Internet proceeds through two separate connections (see graphic): Between the Security Manager and the ADSL modem, a connection using the **PPTP over Ethernet** protocol is established. The ADSL modem is, in turn, connected to the ISP using the **PPP over ATM** dialing protocol.




The configuration will require the DSL connection information, including username and password, provided by your Internet Service Provider.

**Note:**

The installation and specific settings required for **DSL** connections is described in the **DSL Network** guide. Also note that, once the DSL connection is activated, Novell Security Manager will be connected to your ISP 24 hours a day. You should therefore ensure that your ISP bills on a flat-rate or bandwidth-based system rather than based on connection time. The **DSL Network** guide is available at **http://www.novell.com/documentation/nsma51**.

**Configuring PPTP over Ethernet (PPPoA-DSL)**:

1. In the **Network** tab, open the **Interfaces** menu.
2. Click the **New** button to open the **Add Interface** window.
3. In the **Name** entry field, enter a descriptive name for the interface.
4. Use the **Hardware** drop-down menu to select a network card.

**Tip:**

For an external connection (e.g., to the Internet) choose the card with Sys ID **eth1**.

You cannot choose a network card that has already been configured with a primary network address.

5. Use the **Type** drop-down menu to select the **PPTP over Ethernet (PPPoA-DSL) connection** interface type.

   You will need the connection settings provided by your ISP to configure the following settings.

   **Address**: If you have not been assigned a static IP address by your provider, keep the default **Assigned by remote** setting here.
   If you have a static IP address, choose **Static** from the drop-down menu and enter the address in the entry field.

**Important Note:**

If you wish to configure the **Uplink Failover on Interface** function, observe the description of this function while entering the network!

**Default Gateway**: You should probably keep the default setting **Assigned by remote**. Other possible values are **Static** and **None**.

**Modem IP Address**: Enter the IP address of your ADSL modem here. This address will usually be provided by your ISP or the modem hardware, and cannot be changed.
Example: 10.0.0.138 (with **AonSpeed**)

**NIC IP Address**: Enter the IP address of the network card on the Security Manager which is attached to the modem here. This address must be in the same subnet as the modem.
Example: 10.0.0.140 (with **AonSpeed**)

**NIC Netmask**: Enter the network mask to use here.
Example: 255.255.255.0 (with **AonSpeed**)

**Address to Ping**: In order to test the connection between the Security Manager and the external network, you can enter an IP address of a host on the Internet (e.g., the DNS server of your ISP) here. The Security Manager will send ping requests to this host: if no answer is received, the connection will be broken.

**Username**: Enter the username, provided by your ISP.

**Password**: Enter the password, provided by your ISP.

**Uplink Failover on Interface**: This function will only be displayed if the **Assigned by remote** or **Static** is selected in the **Default Gateway** drop-down menu.

You can setup a failover on an interface to the Internet with the help of a second Internet access and an additional network card. Please,

remember in doing so that Novell Security Manager supports only one DSL connection. A failover for the Internet access can, for example, consist of a permanent communication line and a DSL access! If the primary connection fails, the Uplink will automatically be performed by the second Internet connection. In order to monitor the connection, the *primary network card* sends four ping requests to the **Uplink Failover check IP** every five seconds. Only if all four ping requests are not replied to the Backup Interface is loaded.
When the Internet connection is established via the *Backup Interface*, the ping requests are still sent by the *Primary Interface*. As soon as the Security Manager receives the corresponding reply packages again, the Internet connection is again established by the *Primary* Interface.

**Important Note:**

When the **Uplink Failover on Interface** function is used, two different networks must be defined on the *Primary* and *Backup Interface*. Therefore you need next to the additional network card for the *Backup Interface* two separate Internet accesses.

**Uplink Failover on Interface** is by default disabled (**Off**). If you wish to use this virtual interface as primary connection, select **Primary Interface** from the drop-down menu. If this interface shall contain the standby connection, select the **Backup Interface** configuration.

**Uplink Failover check IP**: This entry field will be displayed if the **Primary Interface** setting has been selected for the **Uplink Failover on Interface** function. Enter the IP address of a host here, which replies to the ICMP Ping requests and which, in addition to that, is always reachable! The Security Manager will send ping requests to this host: if no answer is received, the backup interface will be enabled by the failover. In this entry field, there must always be an IP address for the failover!

**QoS Status**: In order to use **Quality of Service (QoS)** bandwidth management on an interface, enable this option. To enable the **Quality of Service (QoS)** function, select **On** from the drop-down menu.

**Important Note:**

For the bandwidth management **Quality of Service (QoS)** you must define the values for **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)**. These values are used as basis for the bandwidth management system: incorrect values can lead to poor management of the data flow. The **Quality of Service (QoS)** function is described in chapter 4.5.1.

**Uplink Bandwidth (kbits)**: These settings will only appear, if the QoS function is enabled. In this entry menu, enter the available bandwidth for the Uplink in full kilobits. This value can be determined either from the values of the upstream interface or from the router. On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection - on an ADSL access the Uplink bandwidth amounts to 128 kBit/s and on a 2-Megabit fixed connection to 2048 kBit/s.

**Downlink Bandwidth (kbits)**: These settings will only appear, if the QoS function is enabled. In this entry menu, enter the available bandwidth for the Downlink in full kilobits. On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection - on an ADSL access the Uplink bandwidth amounts to 768 kBit/s and on a 2-Megabit fixed connection to 2048 kBit/s.

**MTU Size**: The **MTU** is the size (in bytes) of the largest transmittable packet. **MTU** stands for **Maximum Transfer Unit**. For connections, using the TCP/IP protocol, the data will be subdivided into packets. A maximum size will be defined for these packets. Packets larger than this value will be considered too long for the connection and fragmented into smaller ones before transmission. These data packets will be sent again. However, the performance can be limited, if the upper value is too low.

The following values are the defaults for the **PPP over Ethernet (PPPoA-DSL) connection**: **1460** Byte.

6. Confirm these settings by clicking **Add**.

   The system will now check the address and network mask for semantic validity. After a successful check, the new **interface** will appear in the **Current Interface Status** table. The interface is not yet enabled (status light is red).

7. Enable the interface by clicking the status light.

   The interface is now enabled (status light shows green). The **Oper** column will at first show that the interface is **Down**: the system requires a short time to configure and load the settings.

8. Click the **Refresh** button to load the menu again.

   Further information about the **Refresh** function can be found in chapter 3.5 on page 31.

When the message **Up** appears, the interface is fully operational. The network card settings are displayed in the **Parameters** column.

#### 4.3.2.6. PPP over Serial Modem Line


This type of interface is required if you wish to connect to the Internet through a **PPP** modem via the serial interface. For the configuration you need a serial interface and an external PPP modem on Novell Security Manager.
And you also need the DSL access data including password. You will get these data from your provider.

**Setting up PPP over Serial Modem**:

1. In the **Network** tab open the **Interfaces** menu.
2. Click on the **New** button to open the **Add Interface** menu.
3. Now enter the name of the interface into the **Name** entry field.
4. From the **Hardware** drop-down menu select the serial interface.
5. From the **Type** drop-down menu select the **PPP over serial modem line** type of interface.

   **Address**: Keep the default setting **Assigned by remote**, if you have no fix IP-address.
   If you have a fix IP address select **Static** from the drop-down menu and enter the address into the entry field.

**Important Note:**

If you wish to configure the **Uplink Failover on Interface** failover for the network card, adhere to the description of this function for the entry of this network!

**Default Gateway**: Keep the default setting **Assigned by remote**. Potential further settings are **Static** and **None**.

**Username**: Enter the user name, which you have received from your provider.

**Password**: Enter the password, which you have received from your provider.

**Init String**: Enter the string to initialize the modem into the entry field. Remember that it might become necessary to adjust the *Init String* to the modem. In this case, the *Init String* can be gathered from the associated modem manual. If you do not have the required documentation available, enter **ATZ** into the entry field.

**Dial String**: Enter **ATDT** plus the phone number into the entry field. **Example**: ATDT5551230

**Reset String**: Enter the *Reset String* for the modem into the entry field. Remember here as well that it might be necessary to adjust the *Reset String* to the modem. In this case you can gather it from the associated modem manual. If you do not have the required documentation available, enter **ATZ** into the entry field.

**Flow Control**: This function is used to control the data flow. If the data are transferred via the serial connection it might happen that the system cannot process incoming data fast enough. To ensure that no data are lost, this method of controlling the data flow becomes necessary.
With the serial connection to methods are available:

- **Hardware signals**
- **Software signals**

Since, in a PPP-connection all 8 bits are used for the data transfer line and the transferred data contain the bytes of the command signs *Control S* and *Control Q* we recommend keeping the default setting **Hardware** and using a serial connection cable.

**Line Speed**: Set the speed in bits per seconds for the connection between the Security Manager and the modem.
Common values are 57600 Bits/s and 115200 Bits/s

**Uplink Failover on Interface**: This function will only be displayed if in the **Default Gateway** drop-down menu the setting **Assigned by remote** or **Static** has been selected.

With an interface to the Internet you can set-up a failover by means of a second Internet connection, e.g. via the serial interface and a PPP modem.
A failover for the Internet connection can for example consist of a permanent line and of an access via the serial interface! If the primary connection fails, the uplink will automatically be set up through the backup Internet access. In order to monitor the connection, the P*rimary Interface* sends four ping requests to the **Uplink Failover check IP** every five seconds. Only if all four ping requests are not replied to, the Backup Interface is loaded.
When the Internet connection is established via the *Backup Interface* the ping requests are still sent by the *Primary Interface*. As soon as the Security Manager receives the corresponding reply packages to the ping requests again, the Internet connection is again established by the *Primary Interface*.

**Important Note:**

When the **Uplink Failover on Interface** function is used, two different networks must be defined on the *Primary* and *Backup Interface*. Therefore you need two separate Internet accesses next to the additional network card.

**Uplink Failover on Interface** is by default disabled. If you wish to use this network card as primary Internet connection, then configure it in the **Primary Interface** drop-down menu. If this network card shall contain the standby connection, select the setting **Backup Interface**.

**Uplink Failover check IP**: This entry field will be displayed if the **Primary Interface** setting has been selected for the **Uplink Failover on Interface** function. Enter the IP address of a host here (e.g. the DNS server of your Internet Service Provider) , which replies to the ICMP Ping requests and which, in addition to that, is always reachable! The Security Manager will send ping requests to this host: if no answer is received, the backup interface will be enabled by the failover. In this entry field, there must always be an IP address for the failover.

**QoS Status**: In order to use **Quality of Service (QoS)** bandwidth management on an interface, enable this option. To enable the **Quality of Service (QoS)** function, select **On** from the drop-down menu.

---

**Important Note:**

For the bandwidth management **Quality of Service (QoS)** you must define the values for **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)**. These values are used as basis for the bandwidth management system: incorrect values can lead to poor management of the data flow. The **Quality of Service (QoS)** function is described in chapter 4.5.1.

---

**Uplink Bandwidth (kbits)**: This setting will only appear, if the **QoS** function is enabled. In this entry menu, enter the available bandwidth for the Uplink in full kilobits. This value can be determined either from the values of the upstream interface or from the router. On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection.

**Downlink Bandwidth (kbits)**: This setting will only appear, if the **QoS** function is enabled. In this entry menu, enter the available bandwidth for the Downlink in full kilobits. On an interface to the Internet, this value corresponds to the bandwidth of the Internet connection.

**MTU Size**: The **MTU** is the size (in bytes) of the largest transmittable packet. **MTU** stands for **Maximum Transfer Unit**. For connections, using the TCP/IP protocol, the data will be grouped into packets. A maximum size will be defined for these packets. If now the maximum size is too high it might happen that data packets with information concerning the PPP over Ethernet protocol are not delivered and recognized correctly. These data packets will be sent again. However, the performance can be limited, if the upper value is too low.
The largest possible MTU for an Ethernet interface is 1500 Bytes.

The following value is the default for the **Standard Ethernet Interface**: 1500 Byte.

For the interface type **PPP over Ethernet (PPPoA-DSL) Connection** a value for the maximum transmission rate must be defined in bytes in the **MTU Size** entry field.

For the **PPP over Ethernet (PPPoA-DSL) Connection** interface type a MTU-value is defined by default: **1460** Byte

6. Confirm these settings by clicking **Add**.

   The system will now check the address and network mask for semantic validity. After a successful check, the new **interface** will appear in the **Current Interface Status** table. The interface is not yet enabled (status light is red).

7. Enable the interface by clicking the status light.

   The interface is now enabled (status light shows green). The **Oper** column will at first show that the interface is **Down**: the system requires a short time to configure and load the settings.

8. Click the **Refresh** button to load the menu again.

   Further information about the **Refresh** function can be found in chapter 3.5 on page 44.

When the message **Up** appears, the interface is fully operational. The network card settings are displayed in the **Parameters** column.

### 4.3.3. Bridging

Through the **Bridging** two or several similar Ethernet-networks or network segments can be connected to each other. The data packages are forwarded through Bridging-tables, which assign the MAC-addresses to a Bridge Port. The *Bridge* works on layer 2 of the ISO/OSI-layer-model (see chapter 1 on page 9) of the open communication and is independent of higher protocols.

In this security system, the involved networks are defined through the selection of the corresponding network cards. The resulting **Bridge** will then be displayed in the **Interfaces** menu in the **Hardware List** table as a network card together with the **br0** *Sys ID*. Even though the data traffic is transparent via the network cards involved with the *Bridge*, it must be expressly authorized through appropriate packet filter rules. The packet filter rules are defined in the **Packet Filter/Rules** menu.

**Defining the Bridging**:

1. In the **Network** tab, open the **Bridging** menu.
2. Enable the function by clicking the **Enable** button.

   The status light is green.
3. Select the network cards for the corresponding network from the **Member Interfaces** selection field.

   Select at least two network cards. Only one already configured network card can be selected for *Bridging*. Then the Bridge will take over all defined addresses on this network card, such as *Additional Addresses* or *VLAN*-settings.

   If you have only selected unconfigured network cards for the *Bridging*, you can also afterwards define the IP addresses in the **Network/ Interfaces** menu.
4. Click **Start** to start the function.

Now, the network cards will be connected to each other and the *Bridge* will be activated. The selected network cards will be displayed in the **Current Bridged Interfaces** table. Then further functions will be available in this table.

**Further functions**

**Adding Network Cards**: Clicking on the **Add interface to Bridge** button imports a new line to the table. Clicking on the **Click here to select interface** message opens a selection field. Now select the new network card and save your settings by clicking on the **Save** button. The **Cancel** button will reject the selection again.

**Deleting a network card**: Click the trash can icon to delete a network card from the table. If you wish to deactivate the Bridge, click all entries subsequently until only one network card is left. This network card will then be changed to a *Standard Ethernet Interface* and will take over the address settings from the *Bridge*.

#### Bridge Options

This window will be displayed if a Bridge is operating.

**Allow ARP broadcasts**: This function lets you configure whether global **ARP broadcasts** should be forwarded by the *bridge*. If enabled, the bridge will allow broadcasts to the MAC destination address FF:FF:FF:FF:FF:FF. This, however, could be used by an alleged attacker to gather various information about the network cards employed within the respective network segment or even the security product itself. If such broadcasts pass the Bridge, this function should therefore be disabled. By default, the **Allow ARP broadcasts** function is enabled (status light shows green).

After a specific time interval the module will remove inactive MAC addresses from the *Bridging* table. You can edit the control and deleting behavior through the two following settings.

**Garbage Collection Interval** (**seconds**): Use this entry field to define the time interval, with which the Bridging table shall be scrutinized for inactive MAC addresses. Addresses with corresponding timeouts will be deleted. The function is preset to 4 seconds.

**Ageing timeout**: Use this entry field to define, after which time interval an inactive address shall be deleted. The function is preset to 300 seconds.

### 4.3.4. Routing

Every network-connected computer uses a routing table to determine where outbound packets should be sent. The routing table contains the information necessary to determine, for instance, if the destination address is on the local network, or if traffic must be sent via a router – and, if a router is to be used, the table details which router is to be used for which network.

#### Static Routes

The security system will install static routing entries for directly-connected networks by itself. Further routes, however, must be manually entered. This is the case, for instance, when the local network includes a router to

be used for access to a specific network. These routes, called static routes, contain information about how to contact a non-directly connected network.

This menu allows you to define which network card or router should be used to contact various external networks.

**Defining static routes**:

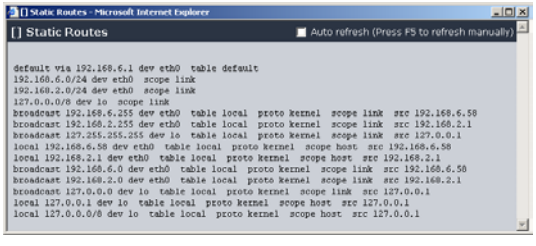
1. Under the **Network** tab, open the **Routing** menu.
2. Click on the **New static route** button.

   An advanced entry menu will open.
3. Choose the network from the **Destination** drop-down menu. The **Destination** drop-down menu contains all static networks, as well as those networks, which you have defined in the **Networks** and **Interfaces** menus.
4. Select the destination from the **Target** drop-down menu.
   Names in two angle brackets characterize network cards (**Interfaces**). Names without brackets stand for a host or a router.
5. Confirm your settings by clicking the **Add static route** button.

   If the definition was successful, the new **Static Route** will always be added to the static route table in a deactivated state (red status light).
6. Activate the static route by clicking the status light.

To remove an entry, click on the trash can icon.

#### Kernel Routing Table




The **Kernel Routing Table** will be displayed in a separate window. This window shows all on the system currently active routes. The system will check each rule in the order of the list, using the first applicable route. By default, the default routes associated with network cards are already entered, and are not editable.

Clicking on the **View static routing table** button opens the *Kernel Routing Table* window.

#### Policy Routes

The Policy-based Routing allows for forwarding and/or routing of data packets according to your own security-policy-based guidelines. Through

the advanced settings the data traffic can be distributed to multiple Internet uplinks. Among others this allows to save costs and to influence the used bandwidth and priorities.

**Defining policy routes**:

1. Under the **Network** tab, open the **Routing** menu.
2. In the Policy Routes window, click on the **New policy route** button.

   The entry window will open.
3. Make the following settings:

   **Position**: Define the line of the table, into which the route rule shall be entered. It is possible, to change the sequence of the routes later. By default, the route is placed at the end (**To Bottom**) of the route-table.

   **Source**: Select the source network of the data packets, which are to be routed, from the drop-down-menu. The **Any** setting applies to all networks.

   **Destination**: Select the target network of the data packets from the drop-down-menu. The **Any** setting applies to all networks.

   **Service**: Use the drop-down menu to select a service.

   This drop-down-menu contains all pre-defined services included to the security system, as well as any you have defined yourself. These services allow you to define precisely which traffic should be processed. The **Any** entry matches any combination of protocols and source and destination ports.

   **Source Interface**: Select a network card here for those data packets, which will be received by the security system and which will be routed.

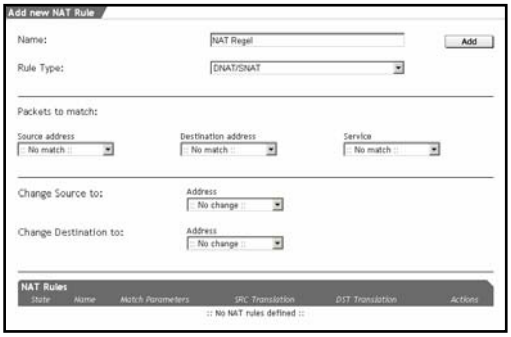
   **Target**: Choose the target IP-address for the data packets from this drop-down-menu.
   Either a network card on the security system or a „Next-Hop"-Host can be configured as target here.
4. Confirm your settings by clicking the **Add static route** button.

   If the definition was successful, the new **Static Route** will always be added to the static route table in a deactivated state (red status light).
5. Activate the static route by clicking the status light.

To remove an entry, click on the trash can icon.

### 4.3.5. NAT/Masquerading

#### 4.3.5.1. NAT




The **Network Address Translation (NAT)** function translates one set of IP addresses (usually private ones) to addresses in another set (usually public). NAT makes it possible for computers on an internal LAN to use private IP addresses, while still allowing them to communicate – through the Novell Security Manager – with the public Internet.

When a client sends an IP packet to the router, NAT translates the sending address to a different, public IP address (from the address space given by the Internet provider) before forwarding the packet to the Internet. When a response packet is received, NAT translates the public address into the original address and forwards it on to the internal client. Depending on system resources, the NAT function can handle arbitrarily large internal networks.

**Destination Network Address Translation (DNAT)** is a special case of NAT whereby the destination addresses of packets are translated. This is especially useful when an internal network uses private IP addresses, but an administrator wishes to make some services available to the public Internet.

**Important Note:**

**PPTP VPN Access** is incompatible with **DNAT**.

**Example**:

Your internal network uses the address space 192.168.0.0/ 255.255.255.0 and a web server running at IP address 192.168.0.20 port 80 should be available to Internet-based clients.

Because the 192.168 address space is private, the Internet-based clients cannot send packets directly to the web server. It is, however, possible for them to communicate with the external (public) address of Novell Security Manager. **DNAT** can, in this case, take packets addressed to port 80 of the system's address and forward them to the internal web server.

**Note:**

The method of setting up a **web server** behind Novell Security Manager is described in the **Web Server/DNAT** guide. The **Web Server/DNAT** guide is available at **http://www.novell.com/documentation/nsma51**.

**Source Network Address Translation (SNAT)** is another special case of **NAT**, and functions just as **DNAT** does, with the difference that **source addresses** (rather than **destination addresses**) are translated.
This is useful in complex networks where replies should be sent from other network addresses.

**Tip:**

To build a simple translation system from an internal network to the Internet, use the **Masquerading** function instead of **SNAT**.

In contrast to **Masquerading**, which is dynamic, **SNAT** uses a static address translation. That is, every internal address is translated to its own externally visible **IP address**.

**Note:**

In order to forward port 443 (HTTPS) to an internal server, you must first change the value of the **WebAdmin TCP Port** (e.g., 1443) for *WebAdmin* in the **System/WebAdmin Settings** menu. This function is described in chapter 4.1.8 in chapter **General Settings**.

**Note:**

Because translation occurs before **Packet filtering**, you must ensure that appropriate rules are entered in the **Packet Filter/Rules** menu. More information on setting packet filter rules can be found in chapter 4.4 on page 140.

**Defining NAT rules**:

1. In the **Network** tab, open the **NAT/Masquerading** menu.
2. In the **Name** field, enter a descriptive name for this **NAT** rule.
3. In the **Rule type** drop-down menu, select the **DNAT/SNAT** function.

   A window named **Properties** will open.
4. In the **Packets to match** window, define which packets should be translated.

At least one parameter in this window must be defined in order to create a valid DNAT/SNAT rule. The setting **No match** means that packets will not be matched on the basis of this parameter.

**Source address**: Choose the original source address here: This can be either a single host or an entire network.

**Destination address**: Choose the original destination address here: This can be either a single host or an entire network.

**Service**: Choose the original service here: the service is defined by source and destination ports as well as protocol used (e.g., TCP).

**Note:**

A **service** can only be redirected when the communicating addresses are also redirected. In addition, a service can only be redirected to another service when the two services use the same protocol.

5. Use the next drop-down menus to define how the packets should be translated.

   At least one parameter in this window must be defined in order to create a valid DNAT/SNAT rule. If you redirect the original address to an entire network, the addresses in that network will be used one after another.

   **Change Source to** *(SNAT)*: Choose a new source address for the translated packets. This can be either a single host or an entire network.

   **Service source**: This drop-down menu will only be shown when you have chosen an address in the **Change source to** menu. Only services with one source port can be used here.

   **Change Destination to** *(DNAT)*: Choose a new destination address here. This can be either a single host or an entire network.

   **Service destination**: This drop-down menu will only be shown when you have chosen an address in the **Change destination to** menu.

6. Save the settings by clicking **Add**.

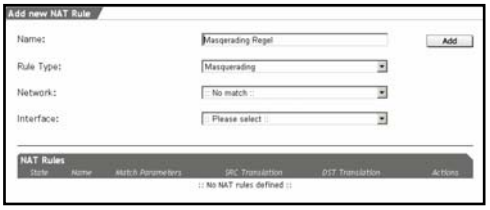
After successfully defining a rule, it will appear in the **NAT Rules** table list. The further functions in the NAT table can now be used for further customization.

**Further Functions**

**Edit rule**: Click **edit** to load the rule into the **Edit NAT Rule** window. The rule can now be changed as desired.

**Delete rule**: Click **Delete** to remove a rule from the list.

#### 4.3.5.2. Masquerading




**Masquerading** is a special case of **SNAT**, which allows you to associate many internal (private) addresses with one external (public) address. This allows you to hide internal IP addresses and network information from the outside network.

The differences between Masquerading and SNAT are:

- Masquerading requires a source network. It will automatically include all services (ports) on that network.
- The translation only occurs when the packet is sent via the supplied network card. The new source address will be that of the interface.

**Masquerading** is intended to hide privately addressed LANs behind one official (public) Internet address.

**Defining Masquerading rules**:

To define masquerading rules, select which network should masquerade as which network card. Normally, the external network card is used.

**Note:**

In order for clients from the defined network to build a connection to the Internet, the appropriate rules must be entered in the **Packet Filter/ Rules** menu.

More information on setting packet filter rules can be found in chapter 4.5 on page 152.

1. In the **Network** tab, open the **NAT/Masquerading** menu.
2. In the **Name** field, enter a descriptive name for this **Masquerading Rule**.
3. Use the **Rule Type** drop-down menu to select **Masquerading**.

   A window named **Properties** will open.
4. Use the **Network** drop-down menu to select a network.
5. Use the **Interface** drop-down menu to select an interface.
6. Save the settings by clicking **Add**.

After a *masquerading rule* has been defined and added, it will appear in the **NAT Rules** table. The further functions in the NAT table can now be used for further customization.

**Further Functions**

**Edit Masquerading rules**: Click **edit** to load the rule into the **Edit NAT Rule** window. The rule can now be changed as desired.

**Deleting Masquerading rules**: Click **delete** to remove a rule from the list.

#### 4.3.5.3. Load Balancing


The **Load Balancing** function allows you to balance incoming connections (e.g. SMTP or HTTP sessions) across different servers behind Novell Security Manager.

**Example**: In the enterprise's DMZ sit two identical HTTP servers with IP addresses 192.168.66.10 and 192.168.66.20. *Load Balancing* can split incoming HTTP requests between the two servers evenly.

Before the load-balancing rule can be defined, the two HTTP servers must be defined as networks (consisting of single hosts) in the **Definitions/ Networks** menu. Next, add both to a single network group.
The procedures for adding **networks** and **network groups** are described in chapters 4.2.1 and 80, respectively.

Once these definitions have been saved, the *load balancing* rules can be defined.

**Defining Load Balancing rules**:

1. In the **Network** tab, open the **NAT/Masquerading** menu.
2. Enter a descriptive name for the **load-balancing rule** in the **Name** entry field.

   A window named **Properties** will open.
3. Enter a descriptive name for the **load-balancing rule** in the **Name** entry field.
4. Use the **Rule Type** drop-down menu to select **Load Balancing**.
5. In the **Pre-Balancing Target** window, select the original destination address and service.

   **Address or Hostname**: Select the original destination address here. This should usually be the external address of Novell Security Manager.

**Service**: Select the destination port (service) to be balanced.

6. In the **Post-Balancing Target Group** drop-down menu, select the new address. This will usually be a network group composed of single hosts.

When the load-balancing rule has been defined and saved, it will appear in the **NAT Rules** table. The further functions in the NAT table can now be used for further customization.

**Editing Load Balancing rules**: Click **edit** to load the rule into the **Edit NAT Rule** window. The rule can now be changed as desired.

**Deleting Load Balancing rules**: Click **delete** to remove a rule from the list.

### 4.3.6. DHCP Service


The **Dynamic Host Configuration Protocol (DHCP)** automatically distributes addresses from a defined IP address pool to client computers. It is designed to simplify network configuration on large networks, and to prevent address conflicts. DHCP distributes IP addresses, default gateway information, and DNS configuration information to its clients.

In addition to simplifying the configuration of client computers and allowing mobile computers to move painlessly between networks, DHCP helps to localize and troubleshoot IP address-related problems, as these are mostly issues with the configuration of the DHCP server itself. It also allows for a more effective use of address space, especially when not all computers will be active at the same time. as addresses can be distributed as needed and re-used when unneeded.

The **DHCP Service** menu offers two operation modes. In the **DHCP Relay** mode the service is provided from a separate DHCP server and the security system works as relay. In the **DHCP Server** mode the security system provides the address range for the connected network.
The configuration of the *DHCP Relay* mode is described in the following. The basic settings and advanced function for the *DHCP Server* mode are described on page 129.

**Configuring the DHCP Relay**:


Before you can make the settings for the **DHCP Relay** mode, the separate DHCP server must be defined in the **Definitions/Networks** menu.

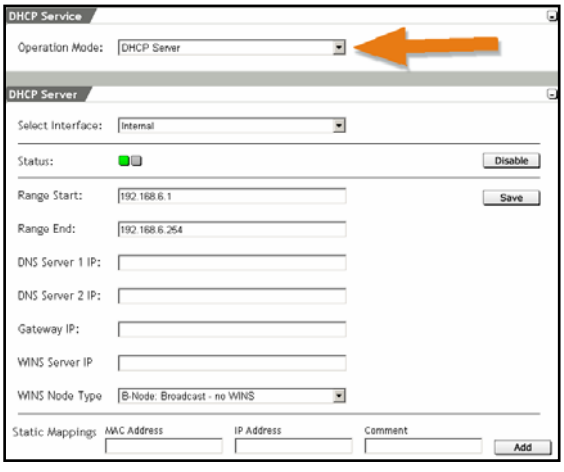
1. In the **Network** tab, open the **DHCP Server** menu.
2. From the **Operation mode** drop-down menu, select the **DHCP Relay** mode.

   The **DHCP Relay** window will open.
3. Enable the function by clicking the **Enable** button in the **Status** line.

   An advanced entry window will open.
4. Use the **DHCP Server** drop-down menu to select the server.
5. In the **Interfaces** selection field select the interfaces, which shall be used to assign the IP addresses to the clients.

The settings will take effect without further confirmation.

**Configuring the DHCP Server**:




1. In the **Network** tab, open the **DHCP Service** menu.
2. In the **Operation Mode** drop-down menu, select the **DHCP Server** mode.

   The **DHCP Server** window will open.
3. From the **Select Interface** drop-down menu, select the interface from which the IP addresses should be assigned to the clients.
4. Enable the function by clicking **Enable** in the **Status** line.

An advanced entry window will open.

5. Use the **Range Start** and **Range End** menus to set the address space from which IP addresses will be distributed.

   By default, the configured address area of the network card will appear in the entry field.

The settings will take effect without further confirmation.

**Assigning DNS servers, Gateway IP and WINS server**:

In the **DHCP Server** operation mode, you can transmit further parameters for the network configuration to the clients. Such as the DNS server addresses and the default gateway to be used by the clients. The security system itself will usually fill both of these functions: in this case, you should enter the internal address of the system in these entry fields.

The DNS Proxy is configured in the **Proxies/DNS** menu. Please see chapter 4.6.4 on page 208 for a description of how to use the DNS proxy.

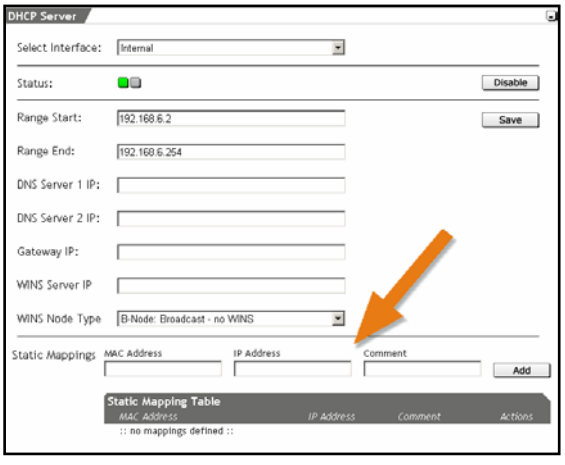
NetBIOS networks can also use a **WINS** server for name resolution. WINS stands for Windows Internet Name Service. WINS servers are MS Windows NT servers with both the Microsoft TCP/IP stack and the WINS server software installed. These servers act as a database matching computer names with IP addresses, thus allowing computers using NetBIOS networking to take advantage of the TCP/IP network.

1. In the **Network** tab, open the **DHCP Service** menu.
2. In the entry fields **DNS Server 1 IP** and **DNS Server 2 IP**, enter the IP address of your name servers.
3. In the **Gateway IP** entry field, enter the IP address of the default gateway.
4. If you wish to assign a **WINS** server, configure the following two settings:

   **WINS Server IP**: Enter the IP address of the WINS server here.

   **WINS Node Type**: Use the drop-down menu to choose which kind of name resolution clients should use. If you choose **Do not set node type**, the client will choose by itself which to use.
5. Save your configuration by clicking **Save**.

**Configuring Static Mappings**:




In the **DHCP Server** operation mode, this function allows you to ensure that specific computers are always assigned the same IP address. To configure this function, you will need to know the MAC (hardware) address of the client's network card.

Determining the MAC addresses of network cards is described on page **Error! Bookmark not defined.**.

1. In the **Network** tab, open the **DHCP Service** menu.
2. In the **Static Mappings** window, make the following settings:

   **MAC Address**: In the MAC Address entry field, enter the MAC address of the network card. The MAC address must be entered as in the following example
   Example: 00:04:76:16:EA:62

   **IP Address**: Enter the IP address into this entry field. The address must be within the range specified by the **Range Start** and **Range End** options.

   **Comment**: In this entry field you can optionally enter a comment on a static mapping.
3. Save the settings by clicking **Add**.

The static address mapping will appear in the **Static Mapping Table**. To remove an entry from this table, click **delete**.

#### Current IP Leasing Table

In the **DHCP Server** operation mode, the **Current IP Leasing** table shows all current IP address mappings. If more than one entry is shown for the same IP address, only the last-listed one is valid. This table will only be shown when there are entries in it.

### 4.3.7. PPTP VPN Access

**Point-to-Point Tunneling Protocol (PPTP)** allows single Internet-based hosts to access internal network services through an encrypted tunnel. **PPTP** is easy to set-up, and requires on Microsoft Windows systems no special client software.

**PPTP** is included with versions of Microsoft Windows starting with Windows 95. In order to use **PPTP** with this security system, the client computer must support the MSCHAPv2 authentication protocol. Windows 95 and 98 users must apply an update to their systems in order to support this protocol. The update is available from Microsoft at:

http://support.microsoft.com/support/kb/articles/Q191/5/40.ASP

Select the VPN Update and, if you use Windows 95, also the RAS Update.

#### PPTP VPN Access

This window allows you to enable or disable **PPTP VPN** access by clicking the **Enable**/**Disable** button.

**Logging**: This drop-down menu allows you to choose how detailed the information recorded in the **PPTP Logs** should be. The **Extensive** setting should be used when you are using the **Live Log** to debug connection problems. When you start the connection, you can view the process in real time.

The **PPTP Live Log** is in the **Local Logs/Browse** menu.

**Encryption**: This drop-down menu allows you to choose between encryption strengths (40-bit or 128-bit). Note that, in contrast to Windows 98 and Windows ME, Windows 2000 does not come with 128 bit encryption installed: to use this kind of connection, the **High Encryption Pack** or **Service Pack 2** must be installed. **SP2** cannot be uninstalled later.

**Security Note:**

You should always set **Encryption** to **Strong** (128-bit) except when your network includes endpoints, which cannot support this.

**Authentication**: Use this drop-down menu to select an authentication method If you have defined a RADIUS server in the **System/User Authentication** menu, you can use RADIUS authentication here as well.
The configuration of the Microsoft IAS RADIUS server and the configuration of RADIUS within **WebAdmin** is described in chapter 4.1.7 on page 52.

**IP Address Assignment**: You can use this function to define whether an address from a defined **PPTP IP Pool** shall be assigned during the dial-up or whether the address will be automatically requested from a **DHCP**-

server.
Please note that the local DHCP server is not supported. The DHCP server to be specified here must be running on a physically different system.

As an alternative to the two options, each user can be assigned a specific IP address. For this an account must be defined for each user in the **Definitions/Users** menu. The assigned IP address must not originate from the *IP Pool*. During the dial-up the address is automatically assigned to the host.

#### PPTP IP Pool

This menu is used to define which IP addresses PPTP hosts should be assigned. The default settings assign addresses from the private IP space 10.x.x.x. This network is called the **PPTP Pool**, and can be used in all of the other security system configuration options. If you wish to use a different network, simply change the definition of the *PPTP Pool*, or assign another defined network as *PPTP Pool* here.

PPTP users are defined in the **Definitions/Users** menu. It is also possible to assign specific users to specific IP addresses. These addresses do not need to be part of the defined PPTP pool. To use these addresses in other parts of the system configuration, such as the packet filter, they must be defined as single hosts (i.e., networks with netmask 255.255.255.255) or as a part of a larger network.

**Note:**

If you use private IP addresses for the **PPTP pool** and you wish *PPTP*-connected computers to be allowed to access the Internet, appropriate **Masquerading** or **NAT** rules must be in place.

#### DHCP Settings

This window will be displayed if you have selected the **DHCP** setting in the **PPTP VPN Access** window under the **IP Address Assignment** function.

**Interface**: Define the network card, across which the DHCP-server is connected. Note that the DHCP does not have to be directly connected to the interface - it can also be accessed through a router.

**DHCP Server**: Select the DHCP-server here. This drop-down-menu displays all hosts, which had been defined in the **Definitions/ Networks** menu.

#### PPTP Client Parameters

This window allows you to define name servers (DNS and WINS) and the name service domain, which should be assigned to hosts during the connection establishment.

**Connections with MS Windows 2000**:

The following example shows how to configure a PPTP VPN connection on a Windows 2000 host.

4. Under the **Network** tab, open the **PPTP VPN Access** menu.
5. In the **PPTP VPN Access** window, enable the system by clicking **Enable**.

   The status light will show green and the menu will open.
6. In the **PPTP VPN Access** window, make the settings for the network access:

   **Logging**: Keep the setting **Normal**.

   **Encryption**: In the drop-down menu, select the encryption type. The available options are **weak (40 bit)** and **strong (128 bit)**.

   Note that, in contrast to Windows 98 and Windows ME, Windows 2000 does not come with 128 bit encryption installed:
   to use this kind of connection, the **High Encryption Pack** or **Service Pack 2** must be installed. **SP2** cannot be uninstalled later. The selected encryption strength will take effect immediately.

   **Important Note:**

   Both sides of the connection must use the same encryption strength. If **WebAdmin** is set to use 40-bit encryption, and the MS Windows 2000 client is set to use 128-bit encryption, Windows will incorrectly report that the connection has been established.

   **Authentication**: Use the drop-down menu to select a service.
7. Now define which IP addresses should be assigned to the hosts when connecting. In the **PPTP IP Pool** window, use the **Network** drop-down menu to select a network. The chosen network will be used immediately.
   The **PPTP Pool** network is selected by default.

   The IP address, network mask, and number of free addresses will appear below the drop-down box.
   Users will be assigned an address from this range automatically.
8. In the **PPTP Client Parameters** window, DNS and WINS servers for PPTP clients can be defined. Two servers may be defined for each.

**Client DNS servers**: Enter the IP addresses of the DNS servers to use.

**Client WINS Servers**: Enter the IP addresses of the Windows name servers to use.

**Client domain**: Enter the DNS domain that the client should append to DNS requests.

**9.** Save your configuration by clicking **Save**.

The rest of the configuration takes place on the user's machine. This will require the IP address of the server, as well as a valid username and password. These should be supplied by the security system administrator.

**1.** In Microsoft Windows 2000, open the **Start/Settings/Network and Dialup Connections** menu.

**2.** Click the **Make New Connection** icon.

The **Network Connection Wizard** will open.

Then click on the **Next** button.

**3.** Select the following option: **Connect to a private network through the Internet**.

Then click on the **Next** button.

**4.** If you have a permanent connection to the Internet, select the following option **Do not dial the initial connection.**

Then click on the **Next** button.

Otherwise, select the **Dial other connections first option** and select your provider from the selection menu. These settings can be changed later in the **Properties** dialog box.

**5.** In the **Destination address** entry field, enter the IP address of the server.

Then click on the **Next** button.

**6.** In the **Connection Availability** window, select whether the connection should be available to all local users, or just this account.

Then click on the **Next** button.

**7.** In the next text entry field, enter a descriptive name for this PPTP connection.

Then click on the **Next** button.

**8.** In the **Start/Settings/Network and Dialup Connections**, a right-click on the new icon will allow you to open the **Properties** window and configure further options:

**General**: This allows you to change the hostname or destination address of the connection. In the **Connect First** window, select any

network connections that need to be established before setting up the PPTP session.

**Options**: The dial and redial options can be defined here.

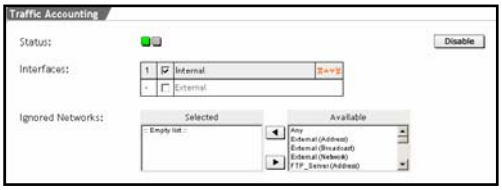
**Security**: Choose the **Advanced (Custom Settings)** option. Next click the **Settings** button. Leave these settings as they are.

**Network**: In the **Type of VPN Server I am calling** menu, select the **Point-to-Point-Tunneling Protocol (PPTP)** option.

**Sharing**: This menu allows you to share the PPTP connection with other computers on the local network.

To start the PPTP connection, simply click the new icon in the **Start/Settings/Network and Dialup Connections** menu. Further information is usually available from the network administrator.

### 4.3.8. Accounting




When the **Accounting** function is enabled, Novell Security Manager will track all transmitted data and compile statistics about it. The accounting menu allows you to select which network cards should be monitored. You can download the data from the **Log Files/Accounting** menu, or view daily reports in the **Reporting/ Accounting** menu.

**Important Note:**

In the normal case, you should only enable **Accounting** on one network card, because, if more than one card is monitored, data forwarded from one monitored interface to another monitored one will be counted twice.

If you use **Masquerading**, you should probably use **Accounting** on the internal interface. Otherwise, data packets dropped by Novell Security Manager filters will be included, and will appear to come from the wrong interface.

It is also possible to exclude certain **Hosts** or **Networks** from the **accounting** records. After installation, all networks are included in accounting records.

It may be useful to block certain hosts or networks from **accounting** data, for instance when a **DMZ** host only communicates with internal systems, but you are only interested in collecting **accounting** data for outbound traffic. ince it might only be used for internal means, it might not be useful to consider its traffic data.

In the **Reporting/Accounting** menu, you can monitor the collected **accounting** data and edit accounting rules.

**Important Note:**

Do not use **accounting** on network interfaces. Doing so may overload the system.

**Configuring Traffic Accounting**:

1. In the **Network** tab, open the **Accounting** menu.
2. Enable the function by clicking the **Enable** button.

   The status light will show green and another entry window will open.
3. In the **Interfaces** selection table, choose the network cards.

   A description of how to use the **selection table** can be found in chapter 3.3.3 on page 29.

4. Use the **Ignored Networks** selection menu to choose which networks to ignore.

   A description of how to use the **selection field** can be found in chapter 3.3.2 on page 28.

The settings in the **Traffic Accounting** menu will immediately be enabled.

### 4.3.9. Ping Check


**Ping** allows you to test the connection with a remote host on the IP level. Please note that these tools require that the **ICMP on firewall** option under the **Packet Filter/ICMP** menu be enabled. **Ping** sends an **ICMP Echo Packet** to the remote machine. When this packet is received by the remote machine, its TCP/IP stack will generate an **ICMP Reply Packet** and send it back. This allows you to test that IP-level connectivity with the remote machine.

**Ping Check** also allows you to check the connection with a host by entering the DNS hostname. In order to do that, **DNS Proxy** must be enabled in the **Proxies/ DNS** menu.

**Note:**

- **Ping** will not work unless **ICMP on firewall** (in the **Packet Filter/ ICMP** menu) is activated.
- **Name Resolution** will not work unless **DNS Proxy** (in the **Proxies/ DNS** menu) is activated.

**Using Ping**:

1. Under the **Network** tab, open the **Ping Check** menu.
2. Use the **Ping Host** drop-down menu to select a network card.

   If this is an interface with a host, configured in one of the menus **Interfaces** or **Networks**, you can select it directly from the drop-down menu.
   (Example: **Internal (Address)** for the internal network card on the Novell Security Manager).

   For another host in the network, select the setting **Custom Hostname/IP Address** from the drop-down menu.
3. In the **Hostname /IP Address** entry field, enter the IP address or hostname.
4. Click **Start** to begin the test connection.

## 4.4. Intrusion Protection

The **Intrusion Protection System (IPS)** recognizes attacks with the help of a signature-based Intrusion Detection set of rules. The system analyzes the complete traffic and automatically blocks attacks before they can reach the network.

The existing set of rules and/or IPS attack signatures are updated through the **Pattern Up2Date** function. New IPS attack signatures will automatically be imported as IPS rule to the IPS set of rules.

### 4.4.1. Settings

#### Global Settings


In the window, configure the basic settings for the **Intrusion Protection System** (**IPS**) option.

**Status**: Clicking on the **Enable** button enables the option.

**Local Networks**: From the selection field select those networks that should be monitored by the Intrusion Protection System (IPS). If no specific network is selected, the complete data traffic will be monitored.

#### Anomaly Detection

The **Anomaly Detection** function statistically and heuristically analyzes the data traffic. It controls the complete data traffic in the network and saves the most often used services and the available hosts. If an abnormal data traffic, service or host is discovered, the module will send a corresponding warning. Also, when data packets appear, which suggest an attack, a warning will be sent. All incidents will be logged to the Intrusion Protection log.
Enable the functions by clicking the **Enable** button.

#### Notification Levels

If the **Intrusion Protection System (IPS)** detects IPS attack signatures or prevents an intrusion, the system will send a message to the administrator. The e-mail address of the administrator can be configured in the **System/Settings** menu.

**Detected Packets**: Use this drop-down menu to select the severity level from which on a warning should be sent (Intrusion Detection).

- **All levels**: for each level of risk.
- **High and medium severity**: for high and medium levels of risk.

- **High severity only**: only for high risk levels.
- **None**: no warning will be sent.

**Blocked Packets**: Use this drop-down menu to select the level of risk, from which on a warning should be sent (Intrusion Prevention).

- **All levels**: for each level of risk.
- **High and medium severity**: for high and medium levels of risk.
- **High severity only**: only for high risk levels.
- **None**: no warning will be sent.

**Notify on anomaly events:** Enable this option to trigger a notification whenever an anomaly event is detected.
Enable the functions by clicking the **Enable** button.

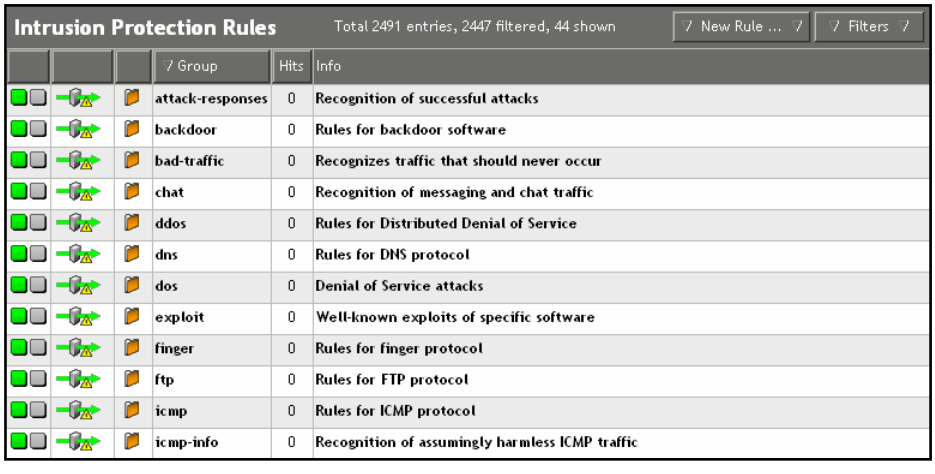
### 4.4.2. Rules

The **Rules** menu contains the **Intrusion Protection System** (**IPS**) set of rules. The already existing base set of rules with the IPS attack signatures can be updated through the **Pattern Up2Date** function, if desired. New IPS attack signatures will automatically be imported as IPS rule to the IPS rules table.

The **Pattern Up2Date** function is described in further detail in chapter 4.1.3 on page 40.

#### IPS Rules Overview

The overview contains all IPS sets of rules.




The functions in the overview from the left to the right:

: Clicking on the status light enables the IPS set of rules.

: The IPS rule can be configured as alarm rule (Intrusion Detection) or as blocking rule (Intrusion Prevention). Clicking on the icon switches the application of the IPS rules in this group.

: Clicking on the folder icon opens the sub-tab with all protocols of this group.

By clicking again on the icon, you will get back to the overview. The additional functions in the sub-tab are described in the „IPS Rules Sub-tab" section.

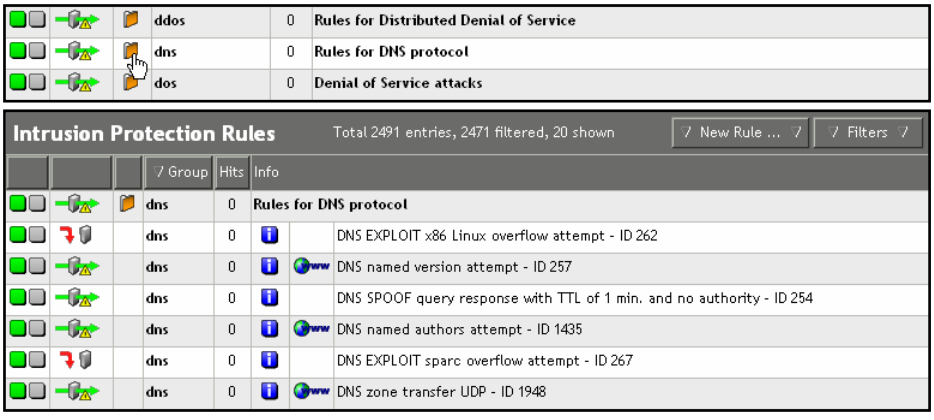
**Group**: The name of the IPS group of rules is displayed in this column. The groups are put in alphabetical order according to this name. Clicking in the header automatically displays the groups in de- or increasing alphabetical order.

**Hits**: This column displays, how often a rule from the group became active.

**Info**: This column provides short information on this IPS rule group.

#### The IPS Rule Sub-tab

All IPS rules of a group are listed in this sub-tab. The sub-group can be opened in the overview by clicking on the folder icon ( ).




The functions in the sub-tab from the left to the right:

: Clicking on the status light enables the IPS rule.

: The IPS rule can be configured as alarm rule (Intrusion Detection) or as blocking rule (Intrusion Prevention). Clicking on the icon switches the application of the IPS rule in this group.

: Return to the overview by clicking on the folder icon.

**Group**: The name of the IPS group of rules is displayed in this column.

**Hits**: This column displays, how often a rule from the group became active.

**Info**: The first line provides short information on this IPS rule group. You can obtain detailed information on the IPS rules by clicking on the correspondent icon with the mouse.

: This window presents the parameters of this as Low Layer Information.

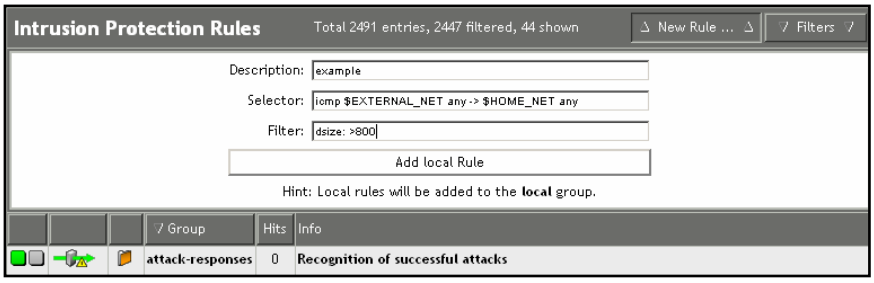
: Clicking on the icon connects you to the correspondent link in the Internet. The Website contains further information on the IPS rule. This information is compiled in projects such as Common Vulnerabilities and Exposures (CVE) and published in the Internet.

**Setting an IPS rule**:

You can add your own IPS rules to the set of rules. The rules are based on the syntax of the Snort Open Source ID System. Manually configured IPS rules are always **locally** imported to an IPS set of rules. For more information please see the following Internet address:
http://www.snort.org.

1. Under the **Intrusion Protection** tab, open the **Rules** menu.
2. Click on the  button.

   The entry window will open.
3. Make the following settings:

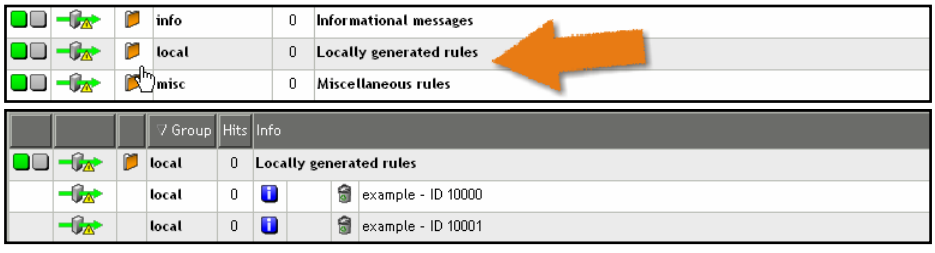



   **Description**: Enter a description of the rule in the entry field.
   Example: `Large ICMP packet`

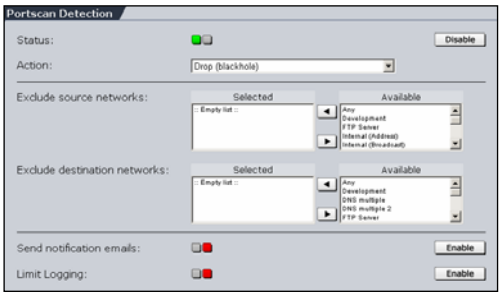
   **Selector**: Enter the selection parameters for the IPS rule in the Snort syntax in the entry field.
   Example: `icmp $EXTERNAL_NET any -> $HOME_NET any`

   **Filter**: Enter the real identification parameter for the IPS rule in Snort syntax in the entry field. Please make sure that the entry ends with a **;**-sign.
   Example: `dsize: >800;`
4. Save your configuration by clicking **Add local Rule**.

The new **IPS rule** is always **locally** imported to an IPS set of rules. The rule is immediately enabled (status light shows green).



### 4.4.3. Portscan Detection




The **Portscan Detection** (**PSD**) feature allows you to detect possible attacks from unauthorized users. Portscans are used by hackers to probe secured systems for available services: In order to intrude into a system, or to start a **Denial-of-Service (DoS)** attack, attackers need information on network services. If this information is available, attackers might make use of the security deficiencies of these services. Network services using the TCP and UDP Internet protocols, can be accessed via special ports and this port assignment is generally known, for example the SMTP service is generally assigned to the TCP Port 25. The ports, used by the services are referred to as open, since it is possible to establish a connection to them. Whereas unused ports are referred to as closed, every attempt to connect with them fails. The attacker tries to find the open ports with the help of a particular software tool, i.e. the Port Scanner. This program tries to connect with several ports on the destination computer. If it is successful, the tool displays the relevant ports as open and the attacker has the necessary information, showing him which network services are available on the destination computer.

The following is an example of the information returned by a port scanner:

```
Interesting ports on (10.250.0.114):
          (The 1538 ports scanned but not shown below are in
          state: closed)
          Port       State    Service
          25/tcp     open     smtp
          135/tcp    open     loc-serve
          139/tcp    filtered netbios-ssn
          445/tcp    open     Microsoft-ds
          1032/tcp   open     iad3
```

Since 65535 ports are available for the TCP and UDP Internet protocols, the ports are scanned at very short intervals. When the firewall detects an unusually large number of attempts to connect to services, especially when these attempts come from the same source address, this is almost certainly due to a portscan.

**PSD** watches for such scans and immediately informs the administrator via e-mail when one is detected. The administrator can also decide what further measures should be taken in response to the scan. The e-mail address of the administrator can be configured in the **System/Settings** menu.

**Security Note:**

The administrator should take special care that all systems have the most recent security patches installed.

The Up2Date service, which updates the security system itself, is detailed in chapter 4.1.3 on page 40.

**Enabling and Disabling Portscan Detection**:

1. In the **Network** tab, open the **Portscan Detection** menu.
2. Click **Enable** next to **Status** to enable the function.

   The **Portscan Detection** window will open.
3. In the **Action taken on portscanner traffic** drop-down menu, select the countermeasures to take when a portscan is detected.

   **Accept**: No further action outside of the notification e-mail is taken.

   This is the default action, as some normal network traffic may be misinterpreted as an attack. In this case, more restrictive countermeasures would only hinder legitimate traffic.

   **Drop (blackhole)**: All following packets in the portscan sequence are silently ignored even if they would otherwise be allowed to pass. The port scanner will report subsequent ports as "filtered".

   **Reject (reply with ICMP deny)**: All following attempts to connect will result in an ICMP "port unreachable" response. The port scanner will report these ports as "closed".

   If either **Drop** or **Reject** is selected, the chosen countermeasure will remain in effect until the portscan-like traffic stops.
4. The following two settings allow you to exclude networks from the Portscan Detection function.

   **Exclude Source Networks**: Select the reliable source networks here, which are to be excluded from the function.

   **Exclude Destination Networks**: Select the reliable destination networks here, which are to be excluded from the function.
5. If the administrator is to be informed by e-mail in the event that a portscan is detected, enable the **Send Notification E-Mails** function.

   The e-Mail address of the administrator can be configured in the **System/Settings** menu.
6. If you wish to minimize the protocol scope, enable the **Limit Logging** function.

   During a portscan many different entries can be made to the corresponding log-file. This function allows you to reduce the protocol

scope to the absolutely necessary scope. The log files are administered in the **Local Logs/Browse** menu.

#### 4.4.4. DoS/Flood Protection

Through the functions in this menu **Denial-of-Service**-(**DoS**)- and **Distributed-Denial-of-Service**-(**DoS**)-attacks can be fended off, by limiting the scope of the SYN-(TCP)-, UDP- and ICMP-packets, which are sent to the network over a specific time interval.

##### SYN (TCP) Flood Protection

**Denial-of-Service** attacks (**DoS**) on servers, shall deny the service access to legitimate users. In the simplest case, the attacker overloads the server with useless packets, to overload its performance. Since a large bandwidth is required for such attacks, more and more attackers start using so-called SYN Flood attacks, which don't aim at overloading the bandwidth, but at blocking the system resources. For this purpose, they send so-called SYN packets to the TCP port of the service, i.e. in a web server to Port 80.

The **SYN (TCP) Flood Protection** function reduces the number of SYN packets, sent to the local network. This is disabled by default (status light shows red).

**SYN (TCP) Flood Protection**:

1. Under the **Intrusion Protection** tab, open the **DoS Flood Protection** menu.
2. Click the **Enable** button next to **Status** to enable the function.

   An advanced entry window will open.
3. In the **Mode** drop-down menu, select the mode.

   **Both source and destination addresses**: In this mode the SYN (TCP) packets will be rejected, which treat both, the source-IP address and the destination IP address: first the SYN packets are filtered for the source address. If, in addition to that, there are also too many requests, also the SYN packets for the destination address will be filtered.

   **Destination address only**: Only those SYN-(TCP)-packets will be rejected in this mode, which treat especially the destination IP address.

   **Source address only**: Only those SYN (TCP) packets will be rejected in this mode, which treat especially the source-IP-address.

   **Logging**: SYN (TCP) flood-attacks might result in the creation of very bulky protocols. This drop-down-menu allows you to define the logging scope. The potential settings are **Everything**, **Limited** and **Off**.

4. The following two settings allow you to exclude networks from the Portscan Detection function.

   **Skip Source Networks**: Select the reliable source networks here, which are to be excluded from the function.

   **Skip Destination Networks**: Select the reliable destination networks here, which are to be excluded from the function.

5. Define the maximum rate for the data packets in the following two settings.

   It is very important to enter appropriate values into both entry fields. If you define values, which are too high, it might happen that for example your web-server fails since it cannot cope with such an amount of SYN-packets. If, otherwise, the rate is too low it might happen that the security system reacts unpredictably and blocks regular requests. The values depend mainly on the hardware, which is installed to the security system. Thus, replace the standard settings through values, which are appropriate for your security system.

   **Source flood packet rate (packets/second)**: Enter the maximum amount of data packets per second into this entry field, which are allowed for source-IP-addresses.

   **Source flood packet rate (packets/second)**: Enter the maximum amount of data packets per second into this entry field, which are allowed for destination IP addresses.

6. Save the settings by clicking **Save**.

#### UDP Flood Protection

The **UDP Flood Protection** function reduces the number of UDP packets, sent to the local network. This is disabled by default (status light shows red).

**UDP Flood Protection**:

1. Under the **Intrusion Protection** tab, open the **DoS Flood Protection** menu.
2. Click the **Enable** button next to **Status** to enable the function.

   An advanced entry window will open.
3. In the **Mode** drop-down menu, select the mode.

   **Both source and destination addresses**: In this mode the UDP packets will be rejected, which treat both, the source-IP address and the destination IP address: first the UDP packets are filtered for the source address. If, in addition to that, there are also too many

requests, also the SYN packets for the destination address will be filtered.

**Destination address only**: Only those UDP packets will be rejected in this mode, which treat especially the destination IP address.

**Source address only**: Only those UDP packets will be rejected in this mode, which treat especially the source IP address.

**Logging**: UDP flood attacks might result in the creation of very bulky protocols. This drop-down-menu allows you to define the logging scope. The potential settings are **Everything**, **Limited** and **Off**.

4. The following two settings allow you to exclude networks from the Portscan Detection function.

   **Skip Source Networks**: Select the reliable source networks here, which are to be excluded from the function.

   **Skip Destination Networks**: Select the reliable destination networks here, which are to be excluded from the function.

5. Define the maximum rate for the data packets in the following two settings.

   It is very important to enter appropriate values into both entry fields. If you define values, which are too high, it might happen that for example your web server fails since it cannot cope with such an amount of UDP packets. If, otherwise, the rate is too low it might happen that the security system reacts unpredictably and blocks regular requests. The values depend mainly on the hardware, which is installed to the security system. Thus, replace the standard settings through values, which are appropriate for your security system.

   **Source flood packet rate (packets/second)**: Enter the maximum amount of data packets per second into this entry field, which are allowed for source IP addresses.

   **Destination flood packet rate (packets/second)**: Enter the maximum amount of data packets per second into this entry field, which are allowed for destination IP addresses.

6. Save the settings by clicking **Save**.

#### ICMP Flood Protection

The **ICMP Flood Protection** function reduces the number of ICMP packets, sent to the local network. This is disabled by default (status light shows red).

**ICMP Flood Protection** :

1. Under the **Intrusion Protection** tab, open the **DoS Flood Protection** menu.
2. Click the **Enable** button next to **Status** to enable the function.

   An advanced entry window will open.
3. In the **Mode** drop-down menu, select the mode.

   **Both source and destination addresses**: In this mode the UDP packets will be rejected, which treat both, the source IP address and the destination IP address: first the ICMP packets are filtered for the source address. If, in addition to that, there are also too many requests, also the SYN packets for the destination address will be filtered.

   **Destination address only**: Only those ICMP packets will be rejected in this mode, which treat especially the destination IP address.

   **Source address only**: Only those ICMP packets will be rejected in this mode, which treat especially the source IP address.

   **Logging**: ICMP flood attacks might result in the creation of very bulky protocols. This drop-down menu allows you to define the logging scope. The potential settings are **Everything**, **Limited** and **Off**.
4. The following two settings allow you to exclude networks from the *Portscan Detection* function.

   **Skip Source Networks**: Select the reliable source networks here, which are to be excluded from the function.

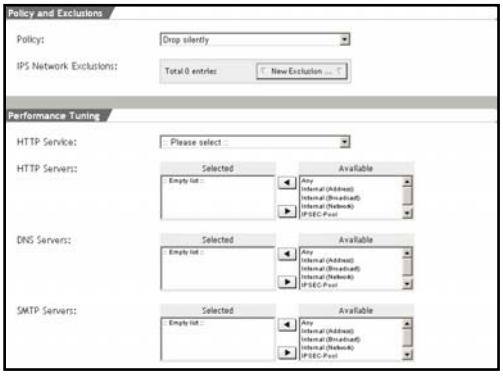
   **Skip Destination Networks**: Select the reliable destination networks here, which are to be excluded from the function.
5. Define the maximum rate for the data packets in the following two settings.

   It is very important to enter appropriate values into both entry fields. If you define values, which are too high, it might happen that for example your web-server fails since it cannot cope with such an amount of ICMP packets. If, otherwise, the rate is too low it might happen that the security system reacts unpredictably and blocks regular requests. The values depend mainly on the hardware, which is installed to the security system. Thus, replace the standard settings through values, which are appropriate for your security system.

   **Source flood packet rate (packets/second)**: Enter the maximum amount of data packets per second into this entry field, which are allowed for source-IP addresses.

   **Destination flood packet rate (packets/second)**: Enter the maximum amount of data packets per second into this entry field, which are allowed for destination IP addresses.
6. Save the settings by clicking **Save**.

### 4.4.5. Advanced




This menu allows you, to configure additional settings for the **Intrusion Protection System (IPS)**. This should, however, only be done by experienced users.

#### Policy and Exclusions

**Policy**: From this drop-down menu select the security policy that the Intrusion Protection System should use, if a blocking rule detects an IPS attack signature.

- **Drop silently**: the data packet will only be blocked.
- **Terminate connection**: a *TCP Reset* and/or *ICMP Unreachable* (*for UDP*) packet will be sent to both communication partners and the connection will be terminated.

**IPS Network Exclusions**: Specific connections between the networks of the Intrusion Protection System (IPS) can be excluded in this selection menu.

The connections will be listed in a table below the selection menu. Clicking the trash can icon ( ) deletes the defined connection from the table.

#### Performance Tuning

The performance of the *Intrusion Prevention System (IPS)* can be enhanced through the settings in this window, in which the servers and ports are defined. The correspondent IPS rules will only be used for the configured servers and ports.

The server must first be added as host in the **Definitions/Networks** menu. For more information on adding hosts, please refer to chapter 4.2.1 on page 80.

**Note:**

If you don't configure a server in this window, the **Intrusion Protection System (IPS)** will monitor the complete data traffic according to the settings in the **Global Settings** window.

**HTTP Service**: In this drop-down menu select the target port for the HTTP data traffic, by selecting a *Service*. In the **Definitions/Services** menu, you can change or add a *Service*, if necessary. The added service will only use the target port number. In the case of a port range, only the first and

last port will be used.
Example: In a port range 80:8080 the HTTP rule will be used for the target port 80 and 8080.

**HTTP Servers**: Select the HTTP servers in this selection field.

**DNS Servers**: Select the DNS servers in this selection field.

**SMTP Servers**: Select the SMTP servers in this selection field.

**SQL Servers**: Select the SQL servers in this selection field.

**Telnet Servers**: Select the Telnet servers in this selection field.

## 4.5. Packet Filter

The **Packet Filter** is the central part of the firewall. In the **Rules** menu you define the allowed data traffic between the networks and hosts in the form of **Packet filter rules**. You can also define specific packets, which will never be allowed to pass through the firewall. The packet filter management is done in the **Rules table**.
The tools in the **ICMP** menu allow you to check the network connections and functions of Novell Security Manager. The additional and reporting functions are available in the **Advanced** menu.

### 4.5.1. Rules

The **Rules** menu allows you to define packet filter sets of rules. These rules are defined with the help of the **network** and **service** definitions.

In general, there are two basic kinds of packet filtering policy:

- Default allow – the rules explicitly define which packets are blocked; all others are allowed.
- Default deny– the rules explicitly define which packets are allowed; all others are dropped.

Novell Security Manager uses a **Block all packets** policy, as this policy is inherently much more secure. This policy requires you to define explicitly, which IP packets will be allowed to pass the filter. All other packets will be blocked and – depending on the action chosen – displayed in the **Packet Filter Live Log**. The **Packet Filter Live Log** can be opened in this menu by clicking on the **Live Log** button or under the **Packet Filter/Advanced** menu. The functions in the **Packet Filter Live Log** are described in chapter 4.5.3 on page 163.

**Example**:

Network A is a subset of network B. Rule 1 allows SMTP traffic destined for Network A. Rule 2 blocks SMTP for network B. Result: Only SMTP traffic for network A will be allowed. SMTP packets from the rest of network B IP addresses will be blocked.

A packet filter rule is defined by the **source address** (**Source**), a **service** (**Service**), the **destination address** (**Destination**) and a **Response** (**Action**).

The following values can be chosen as source and target addresses. Please see the corresponding chapters of this for a more detailed explanation of how to configure and manage these targets.

- A **Network** – networks are defined in the **Definitions/Networks** menu.

- A **Network Group** – network groups are defined in the **Definitions/Network** menu.
- An **Interface** network – logical networks are defined automatically by the system when configuring a new network card or interface. Interfaces can be configured in the **Network/Interfaces** menu.
- An **IPSec Remote Key Object** (**IPSec User Group**) – the IPSec User groups are defined in the **Definitions/Networks** menu. This address or port range is required when configuring packet filter rules for IPSec Road Warrior Endpoints.

A new defined packet filter rule is initially disabled, when it is added to the table. Active rules are applied in the given order, ending with the first matching rule. The order of this process will be displayed in the table through the **Position number** (second column from the left). If you re-sort the rules table later, for example according to the *source address* please, note that the rules won't be displayed in the order in which the system processes the rules. If, however, you change the numerical rule order via the **Position number**, the processing order will change correspondingly. In our example, if rule 2 were moved to be before rule 1, all SMTP traffic for both networks would be blocked. Be very careful when defining rules and their order, as this will determine the security of your firewall.

**Important Note:**

When one filter rule applies, all other rules will be ignored! The sequence of rules is thus very important. Never place a rule like **Any** (*Source*) – **Any** (*Service*) – **Any** (*Destination*) – **Allow** (*Action*) at the top of the rule set.

**Setting Packet Filter Rules**:

1. Under the **Packet Filter** tab, open the **Rules** menu.
2. Click on the **New** button.

   The entry window will open.
3. Make the following settings:

   **Position**: Define the line of the table, in which the packet filter rule will be entered. It is possible, to change the sequence of the packet filter rules later. By default, the rule is placed at the end (**To Bottom**) of the rules table.

   **Group**: For a smooth management of the set of rules, the packet filter rules can be grouped together in one group. This does not influence the way, in which a rule will be processed within the set of rules.
   For the first rule, no group can be selected from the drop-down menu yet. New groups are defined in the set of rules table.

   **Source**: In the drop-down menu, select the source address of the data packets. The **Any** setting applies to all IP addresses, regardless

of whether these are publicly assigned IP addresses or private IP addresses according to RFC1918.

**Service**: Use the drop-down menu to select a service.

This list includes all the pre-defined services included in Novell Security Manager, as well as the ones that you defined yourself. This allows you to define precisely which traffic should be allowed. The **Any** setting represents here all combinations of protocols and source and/or destination ports.

**Destination**: In the drop-down menu, select the destination address of the data packets.

The **Any** setting applies to all IP addresses, regardless of whether these are publicly assigned IP addresses or private IP addresses according to RFC1918.

**Action**: In the **Action** drop-down menu, select the action to execute if a data packet complies with the settings for **Source**, **Service** and **Destination**: In connection with this action, the priority for the **Quality of Service (Qos)** function is also configured here.

**Important Note:**

In order to enable the priorities **high priority** and **low priority**, you must select the respective interface for the **QoS** function in the **Network/Interfaces** menu and also define the values **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)**.

**Allow**: All packets, complying with this rule are allowed to pass.

**Allow (high priority)**: All packets, complying with this rule are allowed to pass. In addition, this data traffic gets a higher priority if the Uplink is overloaded.

**Allow (low priority)**: All packets, complying with this rule are allowed to pass through. In addition, this data traffic gets a lower priority if the Uplink is overloaded.

**Drop**: All packets matching this rule are blocked.

**Reject**: All packets, complying with this rule are denied. In addition, the firewall will send an ICMP error to the sending computer.

**Log**: Any violation of the rule will be reported in the **Packet Filter Live Log**. This action is enabled by clicking on the check box.

For such filter violations, which take place very often, and which are not particularly security-relevant and only reduce the readability of the **Packet Filter Live Log** (e.g., Windows NetBIOS broadcasts), we recommend not to enable the **Log** function.

**Comment**: In this entry field you can optionally enter a comment on a rule.

4. Save your configuration by clicking **Add Definition**.

   If the definition was successful, the new **Packet filter rule** will be added to the rule table in a deactivated state, marked by the red status light.

5. Activate the Packet filter rule by clicking the status light.

After the rule is added to the table, further options are available for managing and editing rules in the rules table.

**Note:**

By default, new rules are added in an **inactive** state in the table. The rule will only become effective when it is set to be **active.** See **Activating/ deactivating rules**.

#### The Rules Table

Each packet filter rule will be displayed in the table through a separate line: The different settings will either be displayed as alphanumeric signs or as symbols. While all settings with alphanumeric signs can be edited by clicking on the correspondent field, this is not possible with all symbol displays.

The following table explains all symbols from the rules table:

**The Symbols**

| Icon | Column | Display/Setting |
|---|---|---|
|  | | Trash can |
|  | Status light | Packet filter rule is disabled |
|  | Status light | Packet filter rule is enabled |
|  | Source/Destination | Host |
|  | Source/Destination | Network |
|  | Source/Destination | Network group |
|  | Source/Destination | DNS Hostname |
|  | Source/Destination | IPSec User Group |
|  | Action | Allow |
|  | Action | Allow (high priority) |
|  | Action | Allow (low priority) |
|  | Action | Drop |
|  | Action | Reject |
|  | Log | Log disabled |

| Icon | Column | Display/Setting |
|---|---|---|
|  | Log | Log enabled |

**Adding/editing groups**: Clicking in the field in the **Group** column opens an entry window. Clicking on the **Save** button saves your changes.
In order to interrupt this process, click on the **Cancel** button.

**Enabling/Disabling Packet filter rules**: The status light in the fourth column shows the rule status. Clicking the status light toggles the state between **active** (green light) and **inactive** (red light).
Deactivated rules remain in the database, but have no effect on firewall behavior.

**Activating the time control**: Clicking on the field in the column with the clock symbol (  ) opens a drop-down menu. Now, you can select the time interval for the packet filter rule. Click on the **Save** button to save your changes.
In order to interrupt this process, click on the **Cancel** button.

If a time interval is configured for a packet filter rule, a clock symbol will be displayed in the corresponding field. The precise settings for this time interval will be displayed, if you touch the clock symbol with the mouse.

The time intervals are defined in the **Definitions/Time Events** menu. The menu is described in more detail in chapter 4.2.4 on page 90.

**Edit rules**: Clicking on the correspondent setting will open an entry window. The rule can then be modified. Click **Save** to save your changes.
In order to interrupt this process, click on the **Cancel** button.

**Re-order rules**: The order of the rules in the table determines the behavior of the firewall; having the correct order is essential for secure operation. By clicking the position number, you can adjust the order to suit your needs. In the drop-down menu select the Position, to which you wish to place the packet filter rule and confirm your settings by clicking on the **Save** button.

**Delete rules**: Click the trash can icon to delete a rule from the table.

**Sorting the rules table**: By clicking on the column headers, you can sort the table: for instance, to sort the rules by sender address, click **Source**. To return to the precedence-based sorting **Matching**, click the column with the position numbers.

#### Filters

The **Filters** function allows you to filter *Packet Filter Rules* by specific attributes. This function enhances the management of huge networks with extensive sets of rules, since rules of a specific type can be presented in a concise way.

**Filtering rules**:

1. Click on the **Filters** button.
2. The entry window will open.
3. Enter the filter attributes in the fields. Not all attributes must be defined.

   **Group**: If you want to filter the rules of a specific group, select them from the drop-down menu.

   **State**: This drop-down menu allows you to filter rules by a specific status.

   **Source**: This drop-down menu allows you to filter rules by a specific source address.

   **Service**: If you want to filter rules by a specific service, select it from the drop-down menu.

   **Action**: This drop-down menu allows you to filter rules by a specific action.

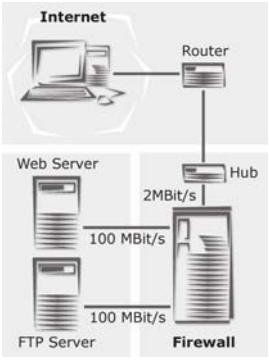
   **Destination Port**: This drop-down menu allows you to filter rules by a specific destination address.

   **Log**: This drop-down menu allows you to filter logged rules.

   **Comment**: If you want to filter rules by specific comments, enter the expressions in the entry menu.
4. To start the filter click on the **Apply Filters** button.

Only the filtered packet filter rules will be displayed then. When the menu is closed, the complete set of rules will be displayed again.

### Quality of Service (QoS)




Internet Service Providers usually measure the service they provide in terms of bandwidth, measured in kBit/s. If a server tries to cross the saturation boundary – if it tries to send more information than the link can carry – the communication can either slow to a crawl or be dropped altogether.

The graphic at left, for example, shows a network with a web server and an FTP server. Both servers share a 2Mbit uplink to the Internet. Due to the protocols, TCP based applications (e.g., FTP) always use the full bandwidth. It might thus happen that not enough bandwidth is available for the Web Server.

The **Quality-of-Service-(QoS)** function allows you to assign different priorities to the connections, if the Uplink is overloaded. These priorities are defined in the packet filter rules through the **Allow**, **Allow (high priority)** and **Allow (low priority)** actions.

---

**Important Note:**

In order to enable the priorities **high priority** and **low priority**, you must select the respective interface for the **QoS** function in the **Network/ Interfaces** menu and also define the values **Uplink Bandwidth (kbits)** and **Downlink Bandwidth (kbits)**.

---

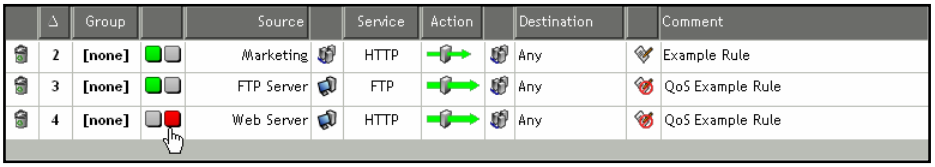
In order to assign the same bandwidth to the connection with the web server, as shown in the example, as the one for the connection with the FTP server, both packet filter rules must be set to the same **Action**:

1. Rule for data packets from the web server:

**Source**: web server
**Service**: HTTP
**To (Server)**: Internet
**Action**: Allow (high priority)

2. Rule for data packets from the FTP server:

**Source**: FTP server
**Service**: FTP
**Destination**: Internet
**Action**: Allow (high priority)



| | Δ | Group | | Source | | Service | Action | | Destination | | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2 | [none] | | Marketing | | HTTP | | | Any | | Example Rule |
| | 3 | [none] | | FTP Server | | FTP | | | Any | | QoS Example Rule |
| | 4 | [none] | | Web Server | | HTTP | | | Any | | QoS Example Rule |

If the Uplink is only used by the data packets of these two servers, each connection receives one half of the bandwidth (1MBit/s) in the **Worst Case**. The **High Priority** setting becomes only relevant, if a third data connection is established. All connections with a lower priority, **Allow** or **Allow (low priority)**, will be treated with a lower ranking.

#### Additional Functions and Settings

**Internet-wide Broadcast**:

In order to **drop IP broadcast** packets, first define the broadcast address in the **Definitions/Networks** menu in the form of a new network. Next, install the appropriate packet filter rule and activate it.

1. Under **Definitions**, open the **Networks** menu and define the following network:

   **Name**: Broadcast32

   **Type**: Host

   **IP Address**: 255.255.255.255

   **Comment** (optional): Enter a comment.

2. Confirm the entries by clicking **Add Definition**.

3. Under **Packet Filter**, open the **Rules** menu and enter the following rule:

   **Source**: Any

   **Service**: Any

   **Destination**: Broadcast32

   **Action**: Drop

   **Comment** (optional): Enter a comment.

4. Confirm the entries by clicking **Add Definition**.

**Segment-wide Broadcast**:

For each network card configured in the Interfaces menu, the system automatically defines a network named **NAME (Broadcast)**.
For more information, please see the **Current Interface Status** section of chapter 4.3.2 on page 93.

1. Under **Packet Filter**, open the **Rules** menu and enter the following rule:

   **Source**: Any

   **Service**: Any

   **Destination**: Select the broadcast network for the relevant interface here.
   Example: NAME (Broadcast)

   **Action**: Drop

   **Comment** (optional): Enter a comment.

2. Confirm the entries by clicking **Add Definition**.

### 4.5.2. ICMP

#### ICMP Settings


This menu is used to configure the settings for **Internet Control Message Protocol (ICMP)** packets:

**ICMP** is used for testing network connectivity and troubleshooting network problems.

**Note:**

More information on **ICMP** can also be found in the **Ping** and **Traceroute** sections.

**ICMP on firewall** and **ICMP forwarding** apply to all IP addresses (**Any**). When **ICMP on firewall** is activated (green status light), all IP addresses can ping the firewall; when **ICMP forwarding** is enabled, computers on the external network can ping hosts behind the firewall. Pings to single IP addresses cannot then be blocked with packet filter rules.

**Important Note:**

Settings configured here take precedence over rules configured in the packet filter rules table.

When the **ICMP** settings are disabled, packet filter rules can be used to allow specific IP addresses or networks to ping the firewall or internal network.

**ICMP Forwarding**: This allows you to forward all ICMP packets behind the firewall. This means, that all IPs in the local network and in all connected DMZs can be pinged.
Click the **Enable** button to enable the function (status light shows green).

**Important Note:**

If you wish to disable **ICMP forwarding**, you must ensure that the **Packet Filter/Rules** menu does not contain a rule of the form **Any** (*Source*) – **Any** (*Service*) – **Any** (*Destination*) – **Allow** (*Action*). Otherwise **ICMP forwarding** will remain active irrespective of the setting here.

**ICMP on Firewall**: The firewall directly receives and forwards all ICMP packets. This is enabled by default /status light shows green).
Click the **Disable** button to change disable the function (status light shows red).

**Note:**

**ICMP on firewall** must be activated to use the **Ping** action. The action is described in more detail in the **Network/Ping Check** menu and is described in chapter 4.3.9 on page 139.

**Log ICMP Redirects**: **ICMP Redirects** are sent from one router to the other, in order to find a better route for a destination. Router then change their routing tables and forward the following packets to the same destination on the supposed better route.
This function logs the *ICMP Redirects*. Clicking on the **Enable** button enables the function (status light is green).

#### Traceroute Settings


**Traceroute** is a tool used to check and troubleshoot network routing. This tool can resolve the path to an IP address. Traceroute lists the IP addresses of the routers that had been used to transport the sent packet. Should the packet path not be reported within a certain time interval, traceroute will report a star (*) instead of the IP address. After a certain number of failures, the test will end.
An interruption of the test can have any number of causes, notably a packet filter along the network path that blocks traceroute packets.

This window shows advanced options related to **ICMP Traceroute**. The settings here can also open the UDP ports **UNIX Traceroute** uses.

**Firewall is Traceroute visible**: When this function is enabled, the firewall will respond to **Traceroute** packets.
Click the **Enable** button to enable the function (status light shows green).

**Firewall forwards Traceroute**: When this function is enabled, the firewall will forward **Traceroute** packets.
Click the **Enable** button to enable the function (status light shows green).

**Note:**

These two functions, **Firewall is Traceroute visible** and **Firewall forwards Trace route,** are probably only useful when both are enabled.

**Traceroute from Firewall**: The Traceroute command can be used on the firewall.
Click the **Enable** button to enable the function (status light shows green).

### Ping Settings


This window contains configuration options specific to **ICMP Ping**.
Further information about **Ping** can be found in chapter 4.3.9 on page 139.

**Firewall is ping visible**: When this function is enabled, the firewall will respond to **Ping** packets. Click the **Enable** button to enable the function (status light shows green).

**Firewall forwards Ping**: When this function is enabled, the firewall will forward **Ping** packets. Click the **Enable** button to enable the function (status light shows green).

**Ping from Firewall**: The **Ping** command can be used on the firewall. Click the **Enable** button to enable the function (status light shows green).

### 4.5.3. Advanced

#### Connection Tracking Helpers


The **Stateful Inspection Packet Filter** and the **NAT** function are provided by the *iptables* module in the *Netfilter* sub-system. All connections, operated with the packet filter, will be tracked by the *Conntrack* module: this is referred to as **Connection Tracking**.

Some protocols, such as FTP or IRC require several communication channels, which cannot be connected through port numbers. In order to use these protocols with the *Packet filter*, or to replace an address through *NAT*, the **Connection Tracking Helpers** are required. Helpers are structures, referring to so-called Conntrack Helpers. Generally speaking these are additional Kernel modules that help the Conntrack module to recognize existing connections.

For FTP data connections, a FTP Conntrack helper, for example, is necessary. It recognizes the data connections, belonging to the control connection (normally TCP Port 21), which can have any destination port and adds the respective expect structures to the expect list.

The following protocols are supported:

- FTP (File Transfer Protocol)
- H323
- IRC (for DCC)
- MMS (Microsoft Media Streaming)
- PPTP (Point to Point Tunneling Protocol)
- TFTP (Trivial File Transport Protocol)

**Loading Helper Modules**: By default, all Helper modules are loaded except for TFTP. The helper modules are loaded and deleted in the selection field.

A description of how to use the **selection field** can be found in chapter 3.3.2 on page 28.

#### SYN Rate Limiter


**Denial-of-Service** attacks (**DoS**) on servers, shall deny the service access to legitimate users. In the simplest case, the attacker overloads the server with useless packets, to overload its performance. Since a large bandwidth is required for such attacks, more and more attackers start

using so-called SYN-Flood attacks, which don't aim at overloading the bandwidth, but at blocking the system resources. For this purpose, they send so-called SYN packets to the TCP port of the service, i.e. in a web server to Port 80.

The **SYN Rate Limiter** function reduces the number of SYN packets, sent to the local network. This is disabled by default (status light shows red).

Click the **Enable** button to enable the function (status light shows green).

#### Protocol Handling


**Strict TCP Session Handling**: To secure a reliable data transport, the Transmission Control Protocol (TCP) that is in the transport layer is used. TCP then creates computer to computer connections and continues to send data, until it receives an affirmative answer that the data have been transmitted. This type of connection is called **TCP Handshake** and is executed in three steps. Before a client is able to exchange data, with a server, for example, he sends a TCP packet, in the header of which there is also a so-called SYN-Bit (sequence number). This is an order to the server, to set up a connection. In addition, the client transmits the so-called window size. This value defines the maximum number of bytes for the usable data in the data package, so that they can be processed on the client. In the second step the server replies by setting an ACK-Bit (Acknowledge) to the header and also transmits the window size. In the last step, the client accepts this with the ACK-Bit and starts to send the data themselves.
The firewall accepts PSH packets without having received a **TCP Handshake**. This is necessary, if, for example after a **Restart** of Novell Security Manager or after a transfer of the second Novell Security Manager with a **High Availability** system the existing connections shall be maintained.

If the **Strict TCP Session Handling** function is enabled, the connection set-up is done by **TCP Handshake**.

**Validate Packet-Length**: The Packet Filter checks the data packets for minimal length if the icmp, tcp or udp protocol is being used.

The minimal data lengths for the individual protocols are:

- icmp: 22 bytes
- tcp: 48 bytes
- udp: 28 bytes

If the data packets are shorter than the minimal values, they are blocked and recorded to the **Packet Filter** log file with the annotation **INVALID_PKT:**.

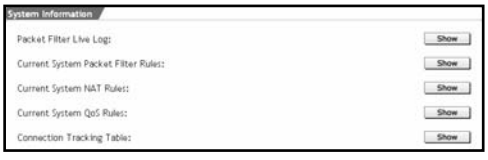
The log files are administered in the **Local Logs/Browse** menu.

### Logging Options

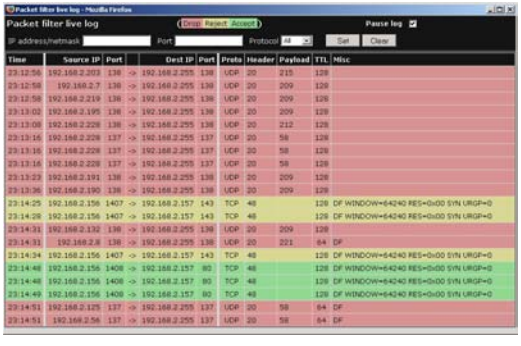

**Log Unique DNS Requests**: DNS packets, which are sent to or through the Firewall and receive a DNS request are recorded to the **Packet Filter** log file with the annotation **DNS_REQUEST:**.
The log files are administered in the **Local Logs/Browse** menu.

**Log FTP Data Connections**: All FTP data connections – either in the **active** or in the **passive mode** – are recorded to the **Packet Filter** log file with the annotation **FTP_DATA:**.
The log files are administered in the **Local Logs/Browse** menu.

### System Information




**Packet Filter Live Log**: The **Packet Filter Live Log** monitors the **packet filter** and **NAT** rules in place on the Security Manager. The window provides a real-time display of packets intercepted by the packet filter. This is especially useful in troubleshooting and debugging packet filter rules. If, after Novell Security Manager starts, a networked application, such as online banking, is not accessible, the Packet Filter Live Log can help you reconstruct which packets are being blocked by the packet filter.




By clicking on the **Show** button, a new window will appear. This window displays rules violations in the order of their occurrence in real time and in table form. The background color allows you to see which action has been performed for the respective violation of a rule:

- Red: The package was dropped.
  Packages that have been blocked due to the *Spoof Protection*, *Validate Packet Length* and *SYN Rate Limiter* functions also have a red background color.
- Yellow: The package was rejected.
- Green: The package was allowed through.

**Setting/Resetting the Live Log Filter**:

With the help of the **IP Address/Netmask** and **Port** entry fields and of the **Protocol** drop-down menu, you can configure the *Packet Filter Live Log* such that only violations of rules with specific attributes are displayed in the table. The filter influences violations of rules that are logged after enabling this function. The filter is enabled by clicking on the **Set** button.

To reset the filter, click the **Clear** button. From this moment on, all violations of rules will be displayed in the *Packet Filter Live Log* again.

Clicking on the **Pause Log** check box interrupts or continues the update.

**Note:**

Please note that only those processed rules will be filed in a protocol, for which the **Log** function has been enabled under **Packet Filter/ Rules**!

**Current System Packet Filter Rules**: The **Current Packet Filter rules** window provides detailed information for expert administrators. The table shows all rules in real time, including system generated ones, and is taken directly from the operating system kernel.

**Current System NAT Rules**: As with the current filter rules, **Current NAT rules** displays all user- and system-defined NAT rules.

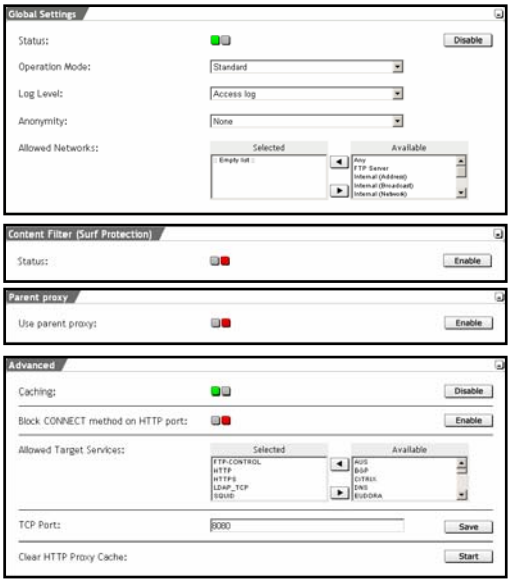
**Connection Tracking Table**: This menu shows a list of all current connections and the connection parameters.

## 4.6. Application Gateways (Proxies)

While a **Packet Filter** filters packets at the network level, **Proxies (also called Application Gateways)** offer control and security at the application level by preventing a direct connection between client and server.
Each **Proxy** can also provide further security services for its service. Since each proxy knows the context of its service, extensive security and protocol options are being offered. This intensive protocol analysis is made possible by well-defined and well-supported protocol standards. The proxies concentrate on the most essential information.

In the **Proxies** tab, select the **Proxies** with the same name and configure the settings. By default, all proxies are disabled. Novell Security Manager contains proxies for **HTTP** (Web), **DNS** (Name server), **SOCKS** (point-to-point connections), **POP3**, **SMTP** (e-mail), and **Ident**.

### 4.6.1. HTTP




The **HTTP** menu allows you to configure Novell Security Manager as a **HTTP Caching Proxy**. This proxy can provide caching services in addition to simple proxy services, resulting in dramatic performance increases: pages, that had already been requested before are no longer re-loaded via the Internet but only retrieved from the proxy cache after the first transmission.

**Note:**

**WebAdmin** should not be used through a proxy. Configure your browser so that connections to Novell Security Manager's IP address do not use a proxy server.

**Microsoft Explorer, avoiding a Proxy use for WebAdmin**:

1. In Explorer, open the **Extras/Internet Options** menu.
2. Choose the **Connections** tab.
3. Open the **LAN Settings/Advanced** menu.
4. Under **Exceptions**, enter the IP Address of your Security Manager.
5. Click **OK** to save your settings.

**Mozilla Firefox, avoiding a Proxy use for WebAdmin**:

1. Open the **Tools/Options/General** menu.
2. Click on the **Connection Settings** button.
3. Click on the **Manual proxy configuration** checkbox.

   Then the entry menu for the proxy configuration will be activated.
4. Enter the IP address of your firewall into the **No Proxy for** entry field.
5. To save the entries, click on the **OK** button.

**Netscape Communicator, avoiding a Proxy use for WebAdmin**:

1. In Netscape, open the **Edit/Settings/Advanced/Proxies** menu.
2. Under **Manual Proxy Configuration** click **Show**.
3. In the **No Proxy for this address** field, enter the IP address of your Security Manager.
4. Click **OK** to save your changes.

The **HTTP proxy** controls web transactions using the HTTP protocol (usually TCP/IP Port 80). Please note that some web servers transmit some data, in particular streaming video and audio, over a port other than 80. These requests will not be noticed when the proxy is in **Transparent** mode: to support such requests, you must either use a different mode, or enter an explicit rule in the **Packet Filter/Rules** allowing them.

**Example**:

**Source**: a local network

**Service**: service with target address (the service must first be defined in the **Definitions/Services** menu)

**Destination**: IP address of the web server (or **Any**)

**Action**: Allow

HTTPS (TCP/IP Port 443) data is passed directly through the Security Manager without processing.

**Note:**

In order to use the **Proxy** in **Standard** mode, the client **Browser** must be configured with the **TCP/IP Address** of the Novell Security Manager and the proxy **port** configured in the **Proxies/HTTP** menu. In addition, the HTTP proxy service requires a valid **Name server (DNS)**. Without configuring the client browser, the **Proxy** can only be used in **Transparent** mode.

#### Global Settings

**Operation Modes**:

**Standard**: In this mode, you must select all networks which should be allowed to use the HTTP proxy service. If a browser on a non-configured network is configured to use the proxy, it will have no access to HTTP services.
If the Word Wide Web shall be accessed without the HTTP proxy, you have to enable the HTTP data traffic between the internal network and the Internet or the web server by a rule in the **Packet Filter/Rules** menu.

**Example**:

**Source**: IP address of a local client

**Service**: HTTP

**Destination**: IP address of the web server or **Any**

**Action**: Allow

To access the World Wide Web via the proxy enter the IP address of the proxy – which is in general the IP address of the internal network card - and the port address 8080 into the browser.

**Transparent**: In this mode, the system notices HTTP requests on the internal network, automatically processes them, and forwards them to the remote server. The client browser is entirely unaware of the proxy server. The advantage of this mode is that no additional administration or configuration is required on the client; the disadvantage is that only pure HTTP (port 80) requests can be forwarded.
All networks allowed to use the transparent proxy must be explicitly listed in the **Allowed Networks** menu. When **Transparent** mode is used, the client browser settings cannot be used to control proxy settings. Moreover, no data can be downloaded from a FTP server in this mode. HTTPS connections (SSL) must be executed via a Packet Filter.

**User Authentication**: This mode complies with the functions of the **Standard** mode. In addition, user access to the HTTP proxy is only authorized after previous **Authentication**.

**Active Directory/NT Domain Membership**: This mode is only available if you have selected the **Active Directory/NT Domain Membership** authentication method in the menu.
If this operation mode is set, only those users are allowed to access the HTTP-Proxy, who belong to a corresponding group (e. g. http_access) on the *Domain Controller*.
In the **Content Filter** window also the **Profile Order/Activation** function will be displayed.

To give Internet access to a user, he must be assigned to a specific profile in the **Profiles** table. If you have already defined the group in your *Active Directory* (*AD*) you must give the same name to the profile (e. g. http_access) as to the group in the tab service. Like that, you only need to define those profiles for the user group, for which the access to specific websites shall be prevented.

Configuring **Surf Protection Profiles** is described in chapter 4.6.1.1 on page 174.

**Note:**

Changes in **Proxies** become effective immediately, without further notice.

**Enabling the HTTP Proxy**:

1. In the **Proxies** tab, open the **HTTP** menu.
2. Enable the proxy by clicking the **Enable** button in the **Global Settings** window.

   Another entry window will open.
3. In the **Operation mode** drop-down menu, select the mode to use.

   Note again that some modes require client-side configuration. The modes are described in chapter "Operation Modes".

   Having set the **Standard** or **Transparent** mode, continue with step 5.
4. If you have selected the **User Authentication** mode from the **Operation mode** drop-down menu, define the authentication method to use here in the **User Authentication** window.

   **Authentication Methods**: Only those authentication methods that you have configured in the **Settings/User Authentication** menu are available here.

If you have configured the **Local Users** method, use the **Allowed users** selection menu to choose users allowed to use the proxy. **Local users** are defined in the **Definitions/ Users** menu.

5. In the **Log level** drop-down menu, choose the appropriate level of logging.

   **Full**: All relevant information is recorded.

   **Access Log only**: The log only records access information, for example URL accessed and username/IP address of the client.

   **None except content filter**: No data are logged for the **Caching** function. The entries of the content filter log are still recorded.

6. The **Anonymity** drop-down menu allows you to choose how much information about the client is passed on to the remote server in HTTP Request Headers.

   **Standard**: The following headers are blocked: Accept-Encoding, From, Referrer, Server, WWW-Authenticate and Link.

   **None**: Client headers are not changed at all.

   **Paranoid**: All headers except those listed below are blocked. Additionally, the "User-Agent" field will be changed so that no information about the internal client is available.
   Allow, Authorization, Cache-Control, Content-Encoding, Content-Length, Content-Type, Date, Expires, Host, If-Modified-Since, Last-Modified, Location, Pragma, Accept, Accept-Language, Content-Language, Mime-Version, Retry-After, Title, Connection, Proxy-Connection and User-Agent.

   **Note:**
   In **Standard** and **Paranoid** modes, the proxy blocks all cookies. If you wish to use cookies, you should use the **none** mode.

7. Use the **Allowed networks** selection menu to select which networks should be allowed to use the proxy.

   If you have configured the **Transparent Mode** in step 3, also the **Skip Source/Destination Networks** selection field will be displayed. You have the possibility to exclude specific network segments or hosts from the allowed networks.

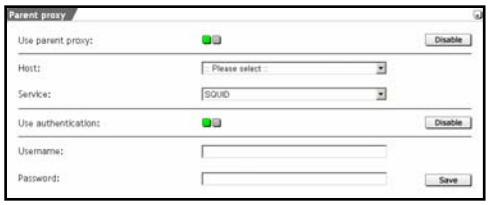
   In the selection fields you can select those networks or hosts, which have been defined before in the **Definitions/Networks** menu.

   A description of how to use the **selection field** can be found in chapter 3.3.2 on page 28.

All settings take effect immediately and will be saved if you leave this menu. Only the HTTP proxy can be accessed from the allowed networks.

See also the functions in the **Advanced** window.

### Parent Proxy




The **Parent Proxy** function is required in those countries, in which an Internet access is only permitted with a state-controlled proxy. This applies to many countries in Africa or Asia. In addition, there might be successive proxies in specific IT landscapes. Once, a **Parent Proxy** has been defined in this window, the HTTP requests are at first sent to the relevant IP address.

**Defining a Parent Proxy**:

1. In the **Proxies** tab, open the **HTTP** menu.
2. Enable the proxy by clicking the **Enable** button in the **Parent Proxy** window.

   An advanced entry window will open.
3. Define the **Parent Proxy**.

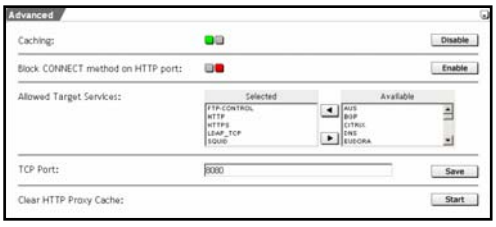
   **Host**: Select the parent proxy server from the drop-down menu. Prior to this, the server must be defined in the **Definitions/Networks** menu.

   **Service**: Select the service from the drop-down menu. Prior to this, the service must be defined in the **Definitions/Networks** menu.
4. Save your settings by clicking on the **Save** button.
5. If an authentication is required for the **Parent Proxy**, click on the **Enable** button.

   **Username**: Enter a user name in the entry field.

   **Password**: Enter the password in this entry field.
6. Save your setting by clicking on the **Save** button.

### Advanced




**Caching**: This function buffers often-used Websites to the **HTTP Proxy Cache**. This is enabled by default (status light shows green). Clicking on the **Disable** button disables this function.

**Block CONNECT Method on HTTP Proxy**: All HTTP connection requests will be blocked by the HTTP proxy. Only the HTTP methods **GET** and **PUT** will be allowed through the proxy. This involves that no HTTPS connections can be established!

Each Client Request will be introduced through the information of the method. Methods define the respective action for requests. The current HTTP-specification offers eight methods: OPTIONS, GET, HEAD, POST, PUT, DELETE, TRACE and CONNECT. Only the *GET* and *PUT* methods are explained in this section.
The **GET** method is used with requests from a document or another source. A source in this case is defined through the request-URL. There are two types: Conditional GET and partial GET. With the conditional-GET-type the request of data depends on certain conditions. The detail of these conditions is stored in the header-field Conditional. Often used conditions are for example If-Modified-Since, If-Unmodified-Since or If-Match. This condition helps to considerably reduce network utilization, since only the necessary data are forwarded. In practice, proxy servers, for example, use this function to prevent that data that are already stored in cache are forwarded several times. Also the partial GET-method has the same purpose. It uses the range-header-field that only forwards parts of the data, which, however, cannot be processed by the client yet. This technique is used for the resumption of an interrupted data transfer.

The **PUT** method allows for a modification of existing sources and/or for the creation of new data on the server. In contrast to the POST-method, the URL in the PUT-request identifies the data sent with the request and not the source.

Clicking on the **Enable** button enables the function (status light is green).

**Allowed Target Services**: Use the **Allowed target services** selection menu to choose services that the HTTP proxy should be allowed to access. By default, the services with the ports are already available, to which a connection is considered as being safe.

**TCP Port**: Enter the **TCP/IP-Port** in the entry field. By default, this is set to the TCP/IP-Port **8080**.

**Clear HTTP Proxy Cache**: The **HTTP Proxy Cache** proxy stores a copy of often-visited pages locally, reducing load times.

By clicking the **Start** button, the cache will be cleared, and any new accesses will be loaded from the remote Internet site.

#### 4.6.1.1. Content Filter (Surf Protection)

The **Surf Protection Profiles** function allows you to produce profiles, which prevent access to certain websites. These profiles can then be associated with certain users or networks, thus allowing control over which sites users may access. The categories are based on the **URL** data base from **Cobion Security Technologies** and can be edited in the **Surf Protection Categories** table.

Each *Surf Protection Profile* contains a **Content Filter** with the modules **Virus Protection for Web** and **Spyware Protection** and further *protection mechanisms*.

The **Spyware Protection** module consists of the following functions:

- Block Spyware (Infection and Communication)
- Block suspicious and unknown sites

Additional *protection mechanisms* are:

- Strip Embedded Objects
- Strip Scripts

This **Surf Protection** module can only be configured when the HTTP proxy is enabled. The *modules* and *protection mechanisms* are described in the **Profiles Table** section.
The information and error messages that are returned by the HTTP proxy are listed in chapter **Error! Reference source not found.** on page **Error! Bookmark not defined.**.

**Important Note:**

The Content Filter connects to Cobion via Port 6000.

**Whitelist Domains**: A **Whitelist** with domains that are basically excluded from the **Surf Protection** module can be defined in the Control List.

The functions of the **Control List** are identical to the **Ordered List** and described in chapter 3.3.5 on page 30.

##### Surf Protection Categories

The **Surf Protection** module contains 18 defined **Surf Protection Categories**. The categories are based on the **URL** data base from **Cobion Security Technologies** and can be edited in this table.

All URLs, contained in *Cobion's* database are assigned to one of 59 sub-categories. This assignment is done by unique category names such as *Hate/Discrimination*, *Online Shopping* or *Pornography*. These content categories can be used to block websites with this content. If a user requests a website, the request is compared to the URL database. If the access to the website violates the Web Policy, defined by the administrator, the request is blocked.

The websites categorized in the URL database are subdivided into 18 categories* and/or 59 sub-categories:

**Community_Education_Religion***

(1) Governmental Organizations
Websites with content for which governmental organizations are responsible (e.g. police departments, fire departments, hospitals) and supranational government organizations (e.g. the United Nations or the European Community).

(2) Non-Governmental Organizations
Websites of non-governmental organizations (e.g. associations, communities, nonprofit organizations and labor unions).

(3) Cities/Regions/Countries
Websites with regional information (e.g. web sites of cities, regions, countries, city maps).

(4) Education/Enlightenment
Websites of universities, colleges, public schools, schools, kindergartens, adult education, course offerings, dictionaries and encyclopedias of any topic.

(5) Political Parties
Websites of and about political parties.

(6) Religion
Websites with religious content (e.g. information about the five main religions, and religious communities that have emerged out of these religions).

(7) Sects
Websites about sects (e.g. cults, psycho-groups, occultism, Satanism).

**Criminal_Activities***

(8) Illegal Activities
Websites describing illegal activities according to German law (e.g. instructions for murder, manuals for bomb building, manuals for murder, instructions for illegal activity, child pornography).

(9) Computer Crime
Websites describing illegal manipulation of electronic devices (e.g. methods and also password encryption and decryption, virus programming and credit card misuse).

(10) Hate and Discrimination
Websites with extremes (e.g. extreme right and left-wing groups, sexism, racism and the suppression of minorities).

(11) Hacking
Information on hacks and cracks (e.g. license key lists and illegal license key generators).

**Drugs***

(12) Illegal Drugs
Websites about illegal drugs (e.g. LSD, heroine, cocaine, XTC, pot, amphetamines, hemp and the utilities for drug use).

(13) Alcohol
Websites dealing with alcohol as a pleasurable activity (e.g. wine, beer, liquor, breweries) and websites of alcohol distributors.

(14) Tobacco
Websites about tobacco and smoking (cigarettes, cigars, pipes), and websites of tobacco vendors.

(15) Self Help/Addiction
Websites from self-help groups, marriage guidance counseling, and help for addiction problems.

**Entertainment_Culture***

(16) Cinema/Television
Websites from cinemas and TV providers (e.g. program information and video on demand).

(17) Amusement/Theme Parks
Leisure organizers (e. g. public baths, zoos, fun fairs and amusement parks).

(18) Art/Museums
Websites about cultural events and museums (e.g. theatres, museums, exhibitions, and opening days).

(19) Music
Websites from music providers (e.g. radio stations, MP3, Real Audio, Microsoft Media, homepages of bands, record labels and music vendors).

(20) Literature/Books
Websites about literature and books (e.g. novels, poems, specialized books, cooking books, advisories, etc.).

(21) Humor/Comics
Websites with humorous content (e.g. jokes, sketches).

(22) Extremistics
Websites with extreme content (e.g. violence). These URLs are generally already assigned to other sub-categories.

**Finance_Investing***

(23) Brokerage
Websites displaying stock exchanges rates dealing exclusively with the main stocks (e.g. finance, brokerage and online trading).

(24) Investing
Websites about real estate (e.g. insurance, and construction financing).

(25) Banking
Websites of banks (e.g. bank offices, credit unions, and online bank accounts).

**Games_gambles***

(26) Gambling
Websites of lottery organizations (e.g. casinos and betting agencies).

(27) Computer Games
Websites of computer games (e.g. computer game producers, cheat sites and online gaming zones).

(28) Toys
Websites containing information about toys (e.g. dolls, modeling, scale trains/cars, board games, card games and parlor games).

**Information_Communication***

(29) General News/Newspapers/Magazines
Websites that inform about general topics (e.g. magazines or newspapers).

(30) Web Mail
Websites that enable internet users to send or to receive e-mails via the internet. All providers of web mail services are categorized in this sub-category as well.

(31) Chat
Websites that allow users to have a direct exchange of information with another user from place to place. All providers of web mail services are categorized in this sub-category as well.

(32) Newsgroups/Bulletin New Boards/Discussion Sites
Websites that enable sharing information such as on a pin board, including a variety of topics.

(33) SMS/Mobile Phones fun Applications
Websites that enable users to send short messages via SMS via the Internet to a mobile phone. It also includes providers and services for mobile phone accessories that are not necessary for daily use (e.g. games, ring tones and covers).

(34) Digital Postcards
Websites that allow people to send digital postcards via the internet, and also the providers of these services.

(35) Search Engines/Web Catalogs/Portals
Websites containing search engines, web catalogues and web portals.

**IT***

(36) Software and Hardware Vendors/Distributors
Websites of producers of hardware used for information, measuring and modular technology, vendors of software, and distributors that provide hardware and software.

(37) Web Hosting
Websites such as web hosting and Internet Service Providers as well as providers of broadband services.

(38) Information Security Sites
Websites that inform people about security, privacy, data protection in the Internet and in other broadband services as telecommunications.

(39) URL Translation Sites
Websites that enable the translation of parts or the entire content of a website into another language.

(40) Anonymous Proxies
Websites that allow users to anonymously view websites.

**Job_Search***

(41) Job Search
Websites of job offerings (e.g. job searches, job agencies, labor exchanges, temporary work, etc).

**Lifestyle***

(42) Dating/Relationship
Websites that promote interpersonal relationships.

(43) Restaurant/Bars
Websites about bars, restaurants, discotheques, and fast food restaurants.

(44) Travel
Websites about traveling (e.g. monuments, buildings, sights, travel agencies, hotels, resorts, motels, airlines, railways, car rental agencies and tourist information).

(45) Fashion/Cosmetics/Jewelry
Websites about fashion, cosmetics, jewelry, perfume, modeling and model agencies.

(46) Sports
Websites about fan clubs, events (e.g. Olympic Games, World Championships), sport results, clubs, teams and sporting federations.

(47) Building/Residence/Furniture
Websites about building equipment (e.g. property markets, furniture markets, prefabricated houses, design, etc.).

(48) Nature/Environment
Websites about nature and environment (e.g. pets, market gardens, environmental protection etc.).

**Locomotion***

(49) Locomotion
Websites about all kinds of transportation means (e.g. resort automobiles, car tuning, car-exhibitions, motorbikes, airplanes, ships, submarines, bikes, railway, etc.).

**Medicine***

(50) Health/Recreation/Nutrition
Websites about health, recreation and nutrition (e.g. hospitals, doctors, drugstores, psychology, nursing, health food stores and medicine, etc.).

(51) Abortion
Websites about abortion.

**Nudity***

(52) Pornography
Websites containing the depiction of sexually explicit activities and erotic content unsuitable to children or persons under the age of 18.

(53) Erotic/Sex
Websites containing erotic photography and erotic material, as it can be found on television or obtained from magazines free of charge. Sex toys are also in this category. Sexually explicit activities are not listed here.

(54) Swimwear/Lingerie
Websites containing nudity, but with no sexual references. Includes bikini, lingerie and nudity.

**Ordering***

(55) Online Purchasing
Websites from online shops where there is a possibility to choose from a product range and order online.

(56) Auctions/Small Advertisements
Websites from online/offline auction sites, auction houses and online/offline advertisements.

**Private_Homepages***

(57) Private Homepages
Includes private websites and homepage servers.

**Suspicious_and_Uncategorized***

(58) Suspicious and Uncategorized

**Weapons***

(59) Weapons
Websites dealing with guns, knives (not including household or pocket knives), air guns, fake guns, explosives, ammunition, military guns (tanks, bazookas), guns for hunting, and swords.

The main categories can also be completed by sub-categories from one of the other 18 categories. To learn more about editing the *Surf Protection Categories*, please read the following section.

**Editing Surf Protection Categories**:

1. Enable this module by clicking the **Enable** button in the **Content Filter (Surf Protection)** window.

   The status light will show green and an advanced entry window will open.

2. Click the **Show/Hide** button to open the table with the categories.

   The name of category is displayed in the **Name** field. This name will be selected later from the *Profiles Table*. The **Sub-categories** field lists the sub-categories.

3. Now click on the entry, you wish to edit.

   Clicking on **Name** opens another entry window. You can edit the name of a category here.

   If you click on the sub-categories, another selection window will open. All available sub-categories will be listed in this selection field. You can add further *sub-categories* to the *category* here.

   Save your changes by clicking on the **Save** button. To keep an entry, click **cancel**.

4. To close the table, click on the **Show/Hide** button.

The **Surf Protection Categories** window will close.

#### The Profiles Table

Each **Surf Protection Profile** will be displayed in the **Profiles** table through a separate line: All settings can be edited by clicking on the correspondent field.

A **Surf Protection Profile** contains two function groups: The **Surf Protection Categories** with the additional functions *Blacklist, Whitelist* and *Custom HTML Content Removal,* and the **Content Filter**. The *Surf Protection Categories* prevent the access to Websites with a specific content. The *Content Filter* contains the modules *Virus Protection for Web* and *Spyware Protection* and filters moreover Websites with specific technical components.

The information and error messages that are returned by the HTTP proxy are described in chapter **Error! Reference source not found.** on page **Error! Bookmark not defined.**.

#### The Functions

The following picture shows a **Surf Protection profile**:

The functions from the left to the right are:

**Deleting Profiles** (  ): Click on the trashcan icon to delete a profile from the table.

**Name**: This is the name of the Surf Protection Profile. This *Name* is necessary to assign this profile to a specific *Network* or *User*.
Open the editing window by clicking on the field with the entry (e.g., Default). Save your changes by clicking on the **Save** button. To keep an entry, click **cancel**.

**Block SP Categories**: This field allows you to select the website topics, which you wish to block for this profile.
Open the access control list by clicking on the field with the entry (e.g., 0 entries).

The **Surf Protection** module contains 18 defined **Surf Protection Categories**. Those 18 categories are administered and edited in the same table.

The administration of the **Surf Protection Categories** is described on page 180.

**Virus Protection for Web**: This functions checks incoming traffic for dangerous content such as viruses.
Clicking on the check box enables and disables the **Virus Protection for Web**.

**Block Spyware (Infection and Communication)**: This function detects and blocks *Spyware* on the way from the server to the client. Doing this will prevent computers from getting infected by new *Spyware*. In addition to that, this function can detect and prevent the data traffic between the *Spyware*, already installed to a client and the Internet. Such, the *Spyware* will no longer be able to forward the information it has collected to the receiver.

*Spyware* is a type of application, which collects information on a user and his surf habits and forwards this information via the Internet without notifying the user, let alone asking for his authorization.
The notion *Spyware* comprises also the so-called *Adware*, *Malware* or other applications of this type, which spy on the system of a user or threaten it. *Spyware* is dangerous for several reasons:
Security gaps for information and data - in the worst case it contains a tool, through which each entry is detected and recorded and this is also true for passwords. These developments are often supported by commercial dealers, since *Spyware* is most often used to comprehend the customer behavior:

- In general, *Spyware* is installed and implemented unnoticed
- It is difficult to identify or remove *Spyware*
- Most desktop firewalls cannot differentiate the communication of the *Spyware* with the Internet from authorized data traffic

A typical *Spyware* installs itself such that it starts automatically when the computer is booted. It is permanently active. The *Spyware* records the surf behavior of the user and transfers those data to external systems, which use the information to send targeted commercials to the user. In general *Spyware* does not affect the files of a user. The most important damage caused by *Spyware* is due to the recording and use of personal data. In most cases*, Spyware* installs itself through one of the following methods:

- A hidden *Spyware* component is integrated in another, desired program. Thus, the access to web-based applications can often be linked to *Spyware*, e.g. with specific tool bars.
- Unnoticed direct installation to a computer via a so-called *Drive-by* download without prompting the user. These *Drive-by* installations often comprise the so-called *Browser Helper Objects,* which embed themselves as part of a web browser and record the surf behavior of a user.
- HTTP Cookies to record the behavior of a user. A cookie is a mechanism which saves the websites a user has visited to his computer. Cookies are often used to record individual surfing behavior not only for specific websites, but for all websites, a user requested in a specific time span.

This is only then dangerous, when this is backed by a company, which such can retrieve the surf behavior for several sites.

This **Block Spyware** function is the *Cobion* sub-category **Spyware** *(60)*. If this function is enabled, the requested websites are compared to the URLs of this sub-category. If the requested website is categorized in there, it will be blocked. The *Spyware* sub-category is not assigned to one of the 18 main categories. It must only be enabled via the **Block Spyware** checkbox.

**Block suspicious and unkown sites**: Enabling this function will block the browser to open websites of unknown content. This function can be considered as a fallback security mechanism in case a *spyware* contaminated website has not yet been categorized as such.

Another huge benefit of this function is to prevent the user from so-called *Phishing* attacks, since, as a rule, *phishing mails* contain suspicious links. Those links are either *Uncategorized (Cobion sub-category 73)*, *Categorization Failed (74)*, or *Suspicious (75)* having the effect that those categories will be blocked. Thus, even if a *phishing mail* has been delivered, the user cannot click on the fraudulent links. Next to potentially contaminated URLs, it might also happen that regular websites for Online Banking, which are often falsified by *Phishers*, are categorized. However, other URLs which actually should be allowed may also be blocked. Those Web pages can be added to the appropriate *URL Whitelist* in order to grant access.

**Strip Embedded Objects**: This function deletes embedded objects in websites such as ActiveX, Flash or Java from the incoming HTTP traffic.

**Security Note:**

Enable the **Strip Embedded Objects** function only, if high security demands apply to your network.

Clicking on the check box enables and disables the **Strip Embedded Objects**.

**Strip Scripts**: This function deletes script contents, such as Java and VBScript from incoming HTTP traffic.

**Security Note:**

Enable the **Strip Scripts** function only, if high security demands apply to your network.

Clicking on the check box enables and disables the **Strip Scripts**.

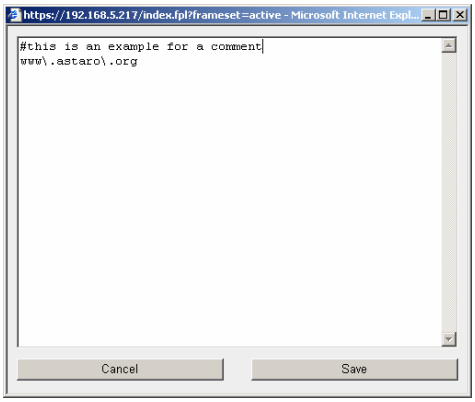
**File extension blocking**: This function is used to block files with extensions from the control list.

Open the access control list by clicking on the line with the entry (e.g. 0 entries). Enter the extensions one beneath the other. Please ensure that

only the „exe" string stands in the line and not also the additional dot in front of the extension (correct: exe, wrong: .exe). Comments must be identified with a **#** sign at the beginning of each line. Save your changes by clicking on the **Save** button. To keep an old entry, click **cancel**.

**URL Whitelist**: This is an additional function from the **Block SP Categories**. With this access control list you can "allow" the access to specific Websites with a content that matches the subjects in the *Surf Protection Categories*.

**Example**: If you have chosen the **Information and Communication** subject in the **Surf Protection Categories** menu, but wish to explicitly allow access to the **www.astaro.org** website, simply add this address to the **Whitelist**.




Open the access control list by clicking on the line with the entry (e.g., 0 entries). Enter the Internet addresses one beneath the other into the entry field (e.g., www\ .astaro\.org). Comments must be identified with a **#** sign at the beginning of each line. Save your changes by clicking on the **Save** button. To keep an entry, click **cancel**.

**URL Blacklist**: This is an additional function of the **Block SP Categories**. With this access control list you can "forbid" the access to specific Websites with a content that doesn't match the subjects in the *Surf Protection Categories*.

Open the access control list by clicking on the line with the entry (e.g., 0 entries). Enter the Internet addresses one beneath the other. Comments must be identified with a **#** sign at the beginning of each line.
Save your changes by clicking on the **Save** button. To keep an entry, click **cancel**.

**Custom HTML Content Removal**: This is an additional function of the **Block SP Categories**. This access control list allows you to filter website in real time (Online Filtering) that contain specific expressions. Such texts, which contain an expression from the access control list, will be replaced by a HTML comment.

Open the access control list by clicking on the directory with the entry (e.g., 0 entries). Enter the expressions one beneath the other. Comments must be identified with a **#** sign at the beginning of each line.
Save your changes by clicking on the **Save** button. To keep an entry, click **cancel**.

**Enabling Surf Protection, adding Profiles**:

1. Enable this module by clicking the **Enable** button in the **Surf Protection (Content Filter)** window.

   The status light will show green and an advanced entry window will open.

   By Default the **Profiles** table contains a **Blank Surf Protection Profile**.

2. To add a new **Blank Surf Protection Profile** to the table, click on the **Add blank Profile** button.

There you can edit the Surf Protection Profile.

**Editing Surf Protection Profiles**:

1. In the **Profiles** table go to the *Surf Protection Profile* that you wish to edit.

2. In the **Name** field enter a descriptive name for the *Surf Protection Profile*.

3. Now make the settings for the **Surf Protection Categories** functional group in the following order.

   **Block SP Categories**: In this field, choose the websites topics to which access should be blocked from your network.

   **URL Whitelist**: In the access control list enter those Internet addresses, for which you wish to "allow" access, even though their topic matches a topic in the **Surf Protection Categories** field.

   **URL Blacklist**: In the access control list enter those Internet addresses, for which you wish to "forbid" access, even though their topic doesn't match a topic in the **Surf Protection Categories** field.

   **Security Note:**

   In the HTTP protocol the header of the request will be filtered by the **HTTP Cache Proxy Squid**.

   This is different in the **HTTPS** protocol - in this case, the squid does not read the header of the request, but performs a pass through. Therefore, the requested **URL** is unknown and cannot be filtered again. This means that the **Surf Protection** module cannot evaluate requested **URLs** on the basis of **White-** or **Blacklists**.

   **Custom HTML Content Removal**: In the access control list enter those expressions that should be deleted from the Web pages.

4. Make the settings for the **Content Scanning Features** functional group.

**Virus Protection for Web**: Clicking on the check box enables and disables the function.

**Block Spyware (Infection and Communication)**: Clicking on the check box enables and disables the function.

**Block suspicious and unkown sites**: Clicking on the check box enables and disables the function.

**Strip Embedded Objects**: Clicking on the check box enables and disables the filter.

**Security Note:**

Enable the **Strip Embedded Objects** function only, if high security demands apply to your network.

**Strip Script**: Clicking on the check box enables and disables the function.

**Security Note:**

Enable the **Strip Script** function only, if high security demands apply to your network.

**File extension blocking**: This function is used to block files with extensions from the control list.

The **Surf Protection Profile** is now edited. Now assign the profile in the **Profile Assignment** table to a *Network* or to a *Local User*.

#### The Profile Assignment Table

The **Surf Protection Profiles** from the **Profiles** table are assigned to Local Users or Networks in the **Profile Assignment** table.

To assign a *Surf Protection Profile* to a local user, the HTTP proxy must be used in the **User Authentication** mode. The assignment of *Profiles* to a network is possible in every operation mode.

---

**Important Note:**

If you are simultaneously assigning a **Profile** to a **local user** and to a **network**, this *Profile* will only take effect, if the user accesses the HTTP proxy from the "configured" network! Only one **Surf Protection Profile** can be configured for each user or network.

---

If you have configured the **User Authentication** configuration mode in the **Global Settings** window, the **Profile Assignment via** drop-down menu will be displayed above the *Profile Assignment* table. By default this is set to **Local Users + Network blocks**.

#### The Functions

The following picture shows a **Profile assignment**:

The functions from the left to the right are:

**Deleting Profile assignments** (): Click the trash can icon to delete an assignment from the table.

**Position number**: The workout sequence will be displayed in the table through the respective **Position number**.
Clicking on the field with the entry will open a drop-down menu. This drop-down menu allows you, to change the order of the profile assignments. Save your changes by clicking on the **Save** button. To keep an entry, click **cancel**.

**Status light**: The status light refers to the status of the profile assignment: Each new assignment is not yet enabled (status light is red). The profile assignment will be enabled by clicking on the status light (status light is green).

**Profile Name**: Select the **Surf Protection Profile** in this field from the Profiles Table.
Clicking on the field with the entry opens the drop-down menu. Save your changes by clicking on the **Save** button. To keep an entry, click **cancel**.

**Time Event** (): Clicking on the field in this column opens a drop-down menu. Now, you can select the time interval for the profile. Click on the **Save** button to save your changes. In order to interrupt this process, click on the **Cancel** button.
If a time interval is configured for a profile, the clock symbol will be

displayed in the corresponding field. The precise settings for this time interval will be displayed, if you touch the clock symbol with the mouse.

The time intervals are defined in the **Definitions/Time Events** menu. The menu is described in more detail in chapter 4.2.4 on page 90.

**Directory Groups**: You will need this entry field only, if you use an authentication via *Radius*, *LDAP* or *Active Directory*. Enter the **Group Name** from the directory service, to which this **Profile** shall be assigned into this column. For *LDAP* please enter the **Distinguished Name** (**DN**), which is also used for the user requests on the LDAP-server.
If you use *Active Directory*, you must define a group with the designation **http_access** to access the HTTP proxy in addition to the *Group Names* in this field.

**Assigned local Users**: Use this field to select the **local user**, who you wish to assign to this profile.
Clicking on this field with the entry opens the selection field. Save your changes by clicking on the **Save** button. To keep an entry, click **Cancel**.

**Important Note:**

If you are simultaneously assigning a **Profile** to a **local user** and to a **network**, this *Profile* will only take effect, if the user accesses the HTTP proxy from the "configured" network! Only one **Surf Protection Profile** can be configured for each user or network.

**Assigned Network Blocks**: Use this field to select the **network**, which you wish to assign to this profile.
Clicking on this field with the entry opens the selection field. Save your changes by clicking on the **Save** button. To keep an entry, click **Cancel**.

**Assigning Surf Protection Profiles**:

By default, the table contains already a **Blank Assignment**. If this blank assignment has not been edited yet, continue with step 1.

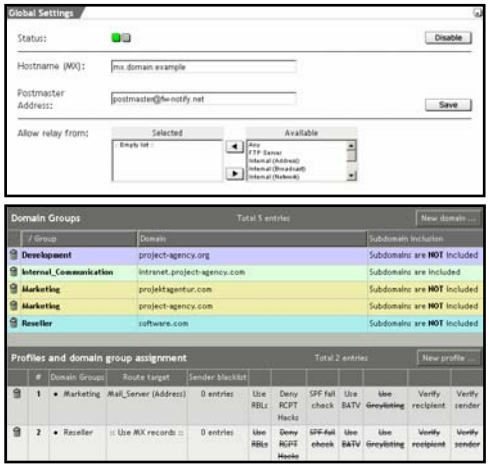
1. By clicking on the **Add blank Assignment** button, add a new blank assignment.
2. From the **Profile Name** field, select the **Surf Protection Profile**.
3. From the **Assigned local Users** field, select the local user for this profile.
4. From the **Assigned Network Blocks**, select the network for this profile.
5. Enable the profile assignment by clicking the **status light**.

   The status light is green.

If a user or computer defined in the profile attempts to access a blocked website, access will be blocked, and the user will receive a message explaining why.

**Skip Image Scanning**: In order to enhance the performance of the **Virus Protection** module, specific contents of Websites can be excluded from the control: In the current version these are images in *GIF* and *JPEG f*ormat. The chance that these components are infected with a virus is very low. Whereas the performance of the module can be increased by up to 25%. Clicking on the **Enable** button, enables this function.

### 4.6.2. SMTP




An **SMTP Proxy** allows you to protect an internal mail server from remote attacks. While forwarding and receiving messages, the proxy can also scan them for potentially dangerous contents. This menu also allows you to configure *anti-spam* parameters to block unwanted e-mails.

This menu allows you to configure the **POP3 Proxy** for incoming e-mails. The SMTP Proxy receives all e-mails at the gateway and then forwards them to their destination. Because there is no direct contact between internal and external machines, only data are transferred, and no protocol errors will propagate. The SMTP proxy monitors the SMTP protocol on TCP port 25.

**Note:**

In order to use the **SMTP** Proxy correctly, a valid **nameserver (DNS)** must be activated. System notifications are sent to the administrator even if the **SMTP proxy** is disabled.

**Configuring the SMTP Proxy**:

1. In the **Proxies** tab, open the **SMTP** menu.
2. Click the **Enable** button next to **Status** to start the proxy.
3. In the **Global Settings** window, configure the basic settings.

   **Hostname (MX)**: Enter the hostname here.

**Important Note:**

If you wish to use TLS encryption, this hostname must be identical with the one listed in your DNS server's **MX record**. Otherwise, other mail servers using TLS will refuse to send incoming mails.

**Postmaster Address**: Enter the e-Mail address of the postmaster here.

4. Save your settings by clicking **Save**.

5. In the **Allow Relay from** window, select the network or hosts, which shall be allowed to send e-mails via the SMTP-Proxy.

**Security Note:**

Messages sent from those networks will never be scanned by **Spam Detection**.

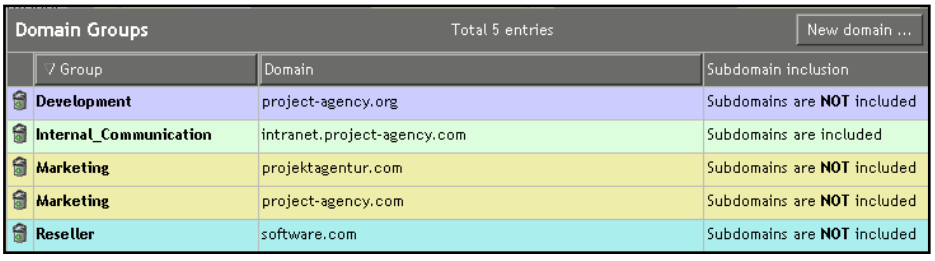
From the hosts, which are not in the **Selected** selection field, e-mails can only be sent to those domains, which are defined in the **Domain Groups** defined.

The basic settings are now made. E-mails can now be sent from the configured networks via the proxy.

#### The Domain-Groups Table

Several domains can be comprised to one group in this table (e.g. mydomain.com, mydomain.de etc.). For each domain, and/or sub-domain a line is added to the table. They will be summarized under the group name.

The following picture shows four **Domain Groups**:




The functions from the left to the right are:

**Deleting a Domain Group** ( ): Clicking on the trash can icon deletes a domain group from the table.

**Group**: This is the name of the group. This group name is required to assign a specific profile to the domain in the line.
Open the editing window by clicking on the field with the entry (e.g. Default). Save your changes by clicking on the **Save** button. To keep an old entry, click **Cancel**.

**Domain**: Enter the domain into this field.
Open the editing window by clicking on the field with the entry (e.g. Default). Save your changes by clicking on the **Save** button. To keep an old entry, click **Cancel**.

**Sub-domain Inclusion**: Clicking on the message in this column, allows you to integrate the sub-domains into the group.

**Adding and editing domains**:

1. To enter a **Blank-Domain** into the table, click on the **New Domain** button.

   Then you can edit the *Domain*-line.

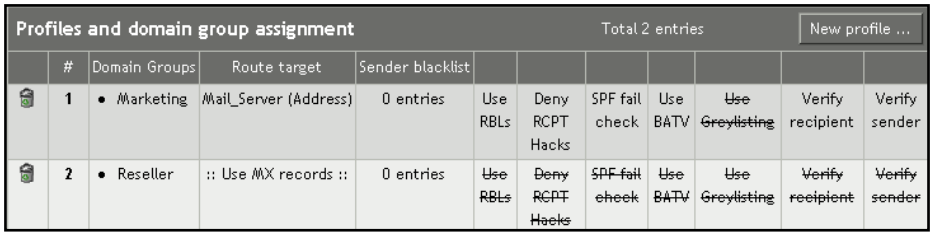
2. In the text entry field **Group**, enter a descriptive name for the domain group.

3. Enter the domain into the **Domain** field.

4. If the sub-domains are included in the group, click on the **Subdomain inclusion** field.

#### The Profiles-and-Domain-Group-Assignment table

The following picture shows two **Domain Profiles**:



Profiles and domain group assignment — Total 2 entries — New profile ...

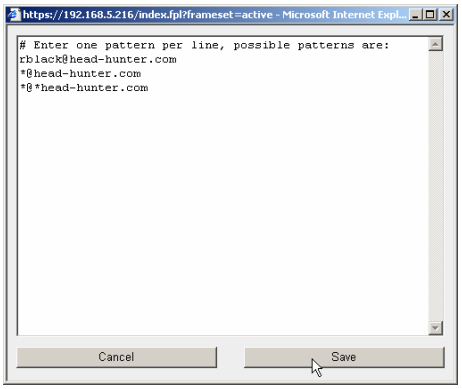
| | # | Domain Groups | Route target | Sender blacklist | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | • Marketing | Mail_Server (Address) | 0 entries | Use RBLs | Deny RCPT Hacks | SPF fail check | Use BATV | ~~Use Greylisting~~ | Verify recipient | Verify sender |
| | 2 | • Reseller | :: Use MX records :: | 0 entries | ~~Use RBLs~~ | ~~Deny RCPT Hacks~~ | ~~SPF fail check~~ | ~~Use BATV~~ | Use Greylisting | ~~Verify recipient~~ | ~~Verify sender~~ |

The functions from the left to the right are:

**Domain Groups**: This field allows you to select the **Group Name** from the **Domain-Groups** table.

**Route Target**: All e-mails for this domain-group must be forwarded to a specific host. This will normally be a host like **Microsoft Exchange Server** or **Lotus Notes**. Prior to that, the host must be defined in the **Definitions/Networks**.
You can also set the system to forward e-mails to the system specified by the MX record. You should take care that the firewall itself is not the MX host for the domain.

**Sender Blacklist**: This function allows you to create a list of sender addresses, for example those of known spam senders. The proxy will then reject all messages with these addresses in either the *From* or *Reply-To* headers.




Enter the address data as described in the following into the control list. Open the control list by clicking on the field with the message (e.g. 0 entries).

- To block e-mails from a certain address.
  Entry: user@domain.com
- To block all e-mails from a certain domain.
  Example: *@domain.com
- To block all e-mails from a certain user, no matter what domain is used to send the message.
  Example: user@*

Comments must be identified with a **#** sign at the beginning of each line. Addresses, starting with this sign, will not be taken into consideration by the *Sender Blacklist* function!
Save your changes by clicking on the **Save** button. To keep an old entry, click **Cancel**.

The number of patterns will then be displayed in the field. If the firewall receives an e-mail from a blocked address, a **5xx** error code will be issued with the message **Your address (envelope or header) is blacklisted at this site**.

**Use RBL**: The **Realtime Blackhole Lists (RBL)** function uses an external database of known spam senders to check sending addresses. Several services of this type are available on the Internet. This function helps to massively reduce the number of spam.

One commercial service, for example, can be found at http://www.mail-abuse.org.

The Internet addresses of the data bases are entered in the **Feature Settings** window into the **RBL Zones** control list.

The function of the **Control List** is identical to the **Ordered List** and described in chapter 3.3.5 on page 30.

**Deny RCPT Hacks**: The proxy will reject e-mails with a sender address containing the characters **!**, **%**, **/**, or **|**or an additional **@.** In addition, addresses with an extra **@** symbol, or which begin with a **dot** (**.**) will also be blocked.

**SPF Fail Check**: With this function, the Firewall controls through the Sender Policy Framework (SPF), whether ingoing e-mails have been sent from the correct server. SPF is made available through specific DNS-entries, which are requested here. Through *SPF* the owners of a domain can publish information on their mail-servers in DNS.
A domain uses public **Records** (**DNS**) to direct requests for the different services (e. g. HTTP, SMTP, etc.) to those computers, which execute those services. The **Mail (MX) Records** are already published by all domains, to inform others on those computers, which contain e-mails for this domain. By **SPF** are now published the „reverse" **Mail (MX) Records**, in which it is disclosed, which computers send e-mails from a specific domain. The receiver of a mail can only control those *Records* and determine whether they have really been sent from this domain.

**Use BATV**: The **Bounce Address Tag Validation** (**BATV**) function is a tool of the standardizing body **Internet Engineering Task Force** (**IETF**). Through domain keys the *Internet Service Provider* (*ISP*) shall be able to reject unwanted mass e-mails more easily, by preventing that the sender address of an e-mail is concealed or falsified. Through the **BATV** function, an encrypted digital signature is appended to outgoing e-mails, which displays the server of the sender.
Through e-mails put into quarantine by the firewall, you will see that 40% of the *Spam Mails* are *Bounce Mails*. The appended signature allows the system to determine, whether the *Bounce Mail*, you have received, was originally caused by your e-mail and not through the sender of *Spam Mails*, who falsified the sender address. This type of *Spam Mails* will then always be rejected by the firewall without the risk of false positives. In addition to that this function is used to reject all e-mails without sender address.
Please note that the signature created through **BATV** is valid only for seven days!

In the **Feature Settings** window, additional settings for the **BATV** function can be made.

**Use Greylisting**: Typically, a mail-server, using **Greylisting**, will record the following three pieces of information for all incoming mail, which is also known as **Triplet**.

- The sender address
- The IP address of the host it is sent from
- The recipient address

This *triplet* is checked against the SMTP proxy's internal database; if the triplet has never been seen before it is created within the database getting a special time stamp. This triplet causes the e-mail to be rejected for a period of time of five minutes. This action is called *Greylisting*. After that period of time the triplet is known and the mail will be accepted when it is sent again.

*Greylisting* uses the fact that most senders of *Spam Mails* use software, working according to the *Fire-and-Forget* method: Attempt to deliver the mail and if it doesn't work, forget it! This means that senders of spam mail do not try to send mails again when there is a *Temporary Failure*s, in contrast to RFC-conforming mails-servers.
If the time stamp is older than five minutes, the e-mail will immediately be delivered and the time stamp will be updated with the current time minus five minutes.

**Verify Recipient**: This function is used to compare the receiver addresses of ingoing e-mails with the addresses on your Backend Mail Server.
To make this work, the Backend Mail Server must reject e-mails to unknown receiver addresses on SMTP-level! The general rule is: If the Backend Mail Server rejects a mail, then the mail will also be rejected by the firewall.

**Verify Sender**: This function is used to check the sender addresses of incoming e-mails. It is checked whether messages can really be delivered from the sender address, by connecting to the host and executing a RCPT-command. If this is not the case the mail will be rejected.

**Editing Domain Profiles**:

1. To add a new **Blank-Profile** to the table, click on the **New Profile** button.

   Then you can edit the *Profile*-line.

2. For incoming e-mails select the group from **Domain Groups** table in the **Domain Groups** field.

   Open the selection window by clicking on the message (e.g. empty).

3. In the **Route Target** field, set the route for incoming mails.

   Open the selection window by clicking on the message (e.g. use MX records).

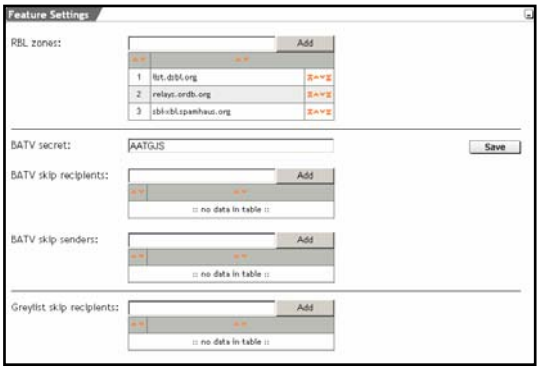
   All e-mails for this domain group must be forwarded to a specific host. This will normally be a host like **Microsoft Exchange Server** or **Lotus Notes**. Prior to that, the host must be defined in the **Definitions/Networks**.
   You can also set the system to forward e-mails to the system specified by the MX record. You should take care that the IP-address of the firewall itself is not the primary MX-Record (Use MX records) host for the domain, because it will not send e-mails to itself.

4. In the other columns configure the **Spam-Protection** functions for this profile.

   The functions are explained in section **Profiles-and-Domain-Group-Assignment-Table**.

The **Domain Profile** is now assigned to a domain group and edited. The settings will be immediately effective and without further confirmation.

### Feature Settings




In the **Feature Settings** windows there are additional settings for the **Spam Protection** functions in the **Profiles and Domain Group Assignment** table.

**RBL Zones**: Enter the Internet addresses of the databases for the **Use RBL** function into the control list.

The function of the **Control List** is identical to the **Ordered List** and described in chapter 3.3.5 on page 30.

**BATV Secret**: The automatically generated **Security Key** can also be defined manually. If you use several firewalls as MX, the same Security Key must be entered on all systems.

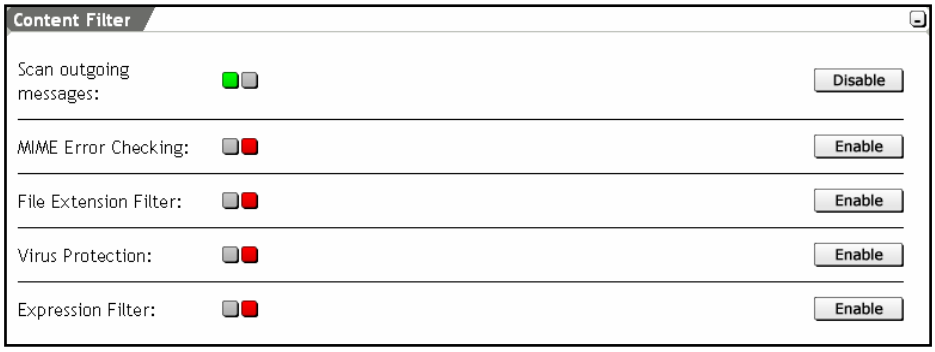
**BATV skip Recipients**: Enter the recipients that should receive unsigned messages into the control list. This is needed, for instance, when posting on mailing lists that make use of the envelope sender address. The disadvantage is that you don't get bounces from the addresses entered in this field.

**BATV skip Senders**: Enter the senders that are allowed to send unsigned messages into the control list.

**Greylist skip Recipients**: Enter the recipients that are exempted from *greylisting* into the control list.

#### 4.6.2.1. Content Filter

**Scan outgoing Messages**




The **Scan Outgoing Messages** function uses the Content Filter for outgoing connections.

**MIME Error Checking**

The **MIME Error Checking** module can detect errors in messages, which have been encrypted with **MIME**. **MIME** stands for **M**ultipurpose **I**nternet **M**ail **E**xtensions. MIME defines the structure and the composition of e-mails and of other Internet messages. This is an encoding rule, which allows for the transmission of non-text documents, e.g. pictures, audio and video in text based transmission systems. The non-text elements are encrypted at the sender and decrypted at the receiver.

The **MIME Error Checking** module can help detecting attacks, in which error tolerance variations in the MIME-decryption-software are being utilized.

**Action**: This drop-down menu allows you to select the action the proxy should take upon finding a message with a filtered string. The following actions are possible:

- **Reject**: The message will be bounced back to the sender with a **5xx** error message and a comment. A Bounce-Mail to the sender does not contain a reason why the e-mail was blocked.
- **Blackhole**: The e-mail will be accepted and silently dropped. Do not use this action unless you are absolutely certain no legitimate e-mails will be lost.
- **Quarantine**: The e-mail will be accepted, but kept in quarantine. The e-mail will be displayed in the **Proxy Content Manger** menu with the status **Quarantine**. This menu presents further options, including options to read or send a mail securely.
- **Pass**: The e-mail will be treated by the filter, but allowed to pass. A **Header** will be added to the e-mail, by which it can be sorted or filtered on the mail server or in the e-Mail programs of the recipient.

A description of how the rules are created in **Microsoft Outlook 2000** can be found on page 202.

**Trigger on**: In this drop-down menu you define, which errors cause, that the e-mail is treated according to the Action function:

- **Level 1**: This step causes that only e-mails with most serious errors are treated. This setting is recommended, since many users use a deficient encryption program that already responds in the higher levels (Level 2 und 3).
- **Level 2**: With the exception of the e-mails with the ordinary errors, all are treated.
- **Level 3**: Any e-mails with errors are treated.

#### File Extension Filter

This module allows the firewall to selectively filter attachments based on their file extensions. The extensions to filter can be selected in the **Extensions** list tool.

**Action**: This drop-down menu allows you to select the action the proxy should take upon finding a message with a filtered string. The following actions are possible:

- **Reject**: The message will be bounced back to the sender with a **5xx** error message. The bounce message sent to the sender will also contain an explanation of why the message was blocked.
- **Blackhole**: The e-mail will be accepted and silently dropped. Do not use this action unless you are absolutely certain no legitimate e-mails will be lost.
- **Quarantine**: The e-mail will be accepted, but kept in quarantine. The e-mail will be displayed in the **Proxy Content Manger** menu with the status **Quarantine**. This menu presents further options, including options to read or send a mail securely.
- **Pass**: The e-mail will be treated by the filter, but allowed to pass. A **Header** will be added to the e-mail, by which it can be sorted or filtered on the mail server or in the e-Mail programs of the recipient.

  A description of how the rules are created in **Microsoft Outlook 2000** can be found on page 202.

**Extensions**: Enter the file extensions, such as **exe**, that the firewall should filter.

The function of the **Control List** is identical to the **Ordered List** and described in chapter 3.3.5 on page 30.

#### Virus Protection

The **Virus Protection** option allows you to check e-mails and attachments for dangerous contents such as viruses, Trojan horses, and so on. The results of the scan are inserted into a header of the message.

If the **Virus Protection** discovers an infected e-Mail, the message will be filtered by the firewall. The further handling will be according to the setting configured in the **Action** drop-down menu.

**Action**: This drop-down menu allows you to select the action the proxy should take upon finding a message with a filtered string. The following actions are possible:

- **Reject**: The message will be bounced back to the sender with a **5xx** error message. The bounce message sent to the sender will also contain an explanation of why the message was blocked.
- **Blackhole**: The e-mail will be accepted and silently dropped.
- **Quarantine**: The e-mail will be accepted, but kept in quarantine. The e-mail will be displayed in the **Proxy Content Manger** menu with the status **Quarantine**. This menu presents further options, including options to safely read the message.
- **Pass**: The e-mail will be treated by the filter, but allowed to pass. A **Header** will be added to the e-mail, by which it can be sorted or filtered on the mail server or in the e-Mail programs of the recipient.

  A description of how the rules are created in **Microsoft Outlook 2000** can be found on page 202.

#### Expression Filter

There is the chance that new viruses will appear which are not yet recognized by the firewall. Various viruses can be identified because of known strings – such as the IloveYou virus. The strings are entered into the control list. If an e-mail contains this string, it will be blocked. Next to simple strings, also expressions can be defined in the form of **Perl Compatible Regular Expressions**.

**Action**: This drop-down menu allows you to select the action the proxy should take upon finding a message with a filtered string. The following actions are possible:

- **Reject**: The message will be bounced back to the sender with a **5xx** error message. The bounce message sent to the sender will also contain an explanation of why the message was blocked.
- **Blackhole**: The e-mail will be accepted and silently dropped.
- **Quarantine**: The e-mail will be accepted, but kept in quarantine. The e-mail will be displayed in the **Proxy Content Manger** menu with the

status **Quarantine**. This menu presents further options, including options to read or send a mail securely.

- **Pass**: The e-mail will be treated by the filter, but allowed to pass. A **Header** will be added to the e-mail, by which it can be sorted or filtered on the mail server or in the e-Mail programs of the recipient.

  A description of how the rules are created in **Microsoft Outlook 2000** can be found on page 202.

**Expressions**: Enter the strings to filter in this list.

The function of the **Control List** is identical to the **Ordered List** and described in chapter 3.3.5 on page 30.

#### 4.6.2.2. Spam Protection


This option heuristically checks incoming e-mail for characteristics suggestive of spam. This system uses an internal database of heuristic tests and characteristics. making the test independent from sender information, and also more reliable.

**Important Note:**

When you use an upstream firewall, it must allow traffic from Novell Security Manager to the Internet on the following ports. They are used for communication to the **Spam Protection** databases:
TCP Port 2703, UDP Port 6277, UDP Port 53 (DNS)

Two **Thresholds** can be defined for the Spam Score. This ensures that potential SPAM e-mails are treated differently by the Firewall.
The two **Thresholds** are equal; whereas the threshold with the higher level should be treated more severely. The functioning is explained below with the help of the default settings.

**Default settings**:

**Threshold One**

**When Spam Level exceeds**: 05 (reasonable)
**do this**: Quarantine

**Threshold Two**

**When Spam Level exceeds**: 08 (conservative)
**do this**: Reject

The first threshold implicates that e-mails from level 5 on are filtered, and put in quarantine. The e-mail will be displayed in the **Proxy Content Manger** menu with the status **Quarantine**.
With the second threshold the e-mail will be sent back with a comment.

Basically, the **Threshold** with the higher level is treated more severely (**do this**).

---

**Important Note:**

On busy systems, the **Spam Detection** may require a large percentage of system resources.

---

**When Spam Level exceeds**: This drop-down menu can be used to select the strategy to use in marking messages as spam. The difference between the maximum values is defined through the probability that legitimates messages, such as HTML Newsletters will be blocked. It is possible to set a value between 1 and 15 in the drop-down menu. With level 1, the e-mails are already treated with a low spam score. The following Levels serve as clue:

- **Aggressive (03)**: This strategy will catch most spam messages. It may also identify some legitimate messages, for example HTML newsletters, as spam.
- **Reasonable (05)**: This strategy is a compromise between **Aggressive** and **Reasonable**
- **Conservative (08)**: This strategy will only catch messages that are highly likely to be spam. Legitimate messages are unlikely to be caught.

**do this**: This drop-down menu allows you to select the action the proxy should take upon finding a message with a filtered string. The following actions are possible:

- **Reject**: The message will be bounced back to the sender with a **5xx** error message. The bounce message sent to the sender will also contain an explanation of why the message was blocked.
- **Blackhole**: The e-mail will be accepted and silently dropped. Do not use this action unless you are absolutely certain no legitimate e-mails will be lost.
- **Quarantine**: The e-mail will be accepted, but kept in quarantine. The e-mail will be displayed in the **Proxy Content Manger** menu with the status **Quarantine**. This menu presents further options, including options to read or send a mail securely.

- **Pass**: The e-mail will be treated by the filter, but allowed to pass. A **Header** will be added to the e-mail, by which it can be sorted or filtered on the mail server or in the e-Mail programs of the recipient. In addition, the word * **SPAM *** will be added to the message subject line.

  A description of how the rules are created in **Microsoft Outlook 2000** can be found on page 202.

**Spam sender Whitelist**: This control list is defined for the **Spam Protection** function. Enter the e-mail addresses of those senders into the list, whose messages you wish to allow through.

The function of the **Control List** is identical to the **Ordered List** and described in chapter 3.3.5 on page 30.

**The Header**:

Many of the functions will add **headers** to the messages scanned: The Header will inform the user on specific characteristics of a message. If you select the **Pass** action, recipients can configure their e-mail programs to filter messages with high spam scores. The following is a list of the headers the SMTP proxy may insert:

- **X-Spam-Score**: This header is added by the **Spam Detection** option. It contains a score, consisting of a numerical value and of a number of minus and plus characters. The higher the value, the more likely it is that the message is spam.
  If you select the **Pass** action under **Spam Detection**, recipients can configure their e-mail software to filter messages.
- **X-Spam-Flag**: This header is set to **Yes** when the proxy classifies a message as spam.
- **X-Spam-Report**: The proxy identified a message as spam. The added Multiline Header contains a readable and accessible anti-spam report.
- **X-Infected**: This header is added if a virus is detected within the message. The value of the header is the name of the virus found.
- **X-Contains-File**: The **File Extension Filter** is enabled and a mail contains an attachment with a potentially dangerous extension is found, the proxy will add this header.
- **X-Regex-Match**: When the **Expression Filter** is enabled and an e-mail contains a sequence of characters from the control list.

**Creating rules in Microsoft Outlook 2000**:

**MS Outlook** allows you to sort those e-mails, which had been filtered and subsequently been allowed to pass through the Firewall, provided that the **Pass** function in the **Action** drop down menu of the corresponding modules on the Firewall has been selected.

1. Start **MS Outlook**.
2. Click on **Inbox**.
3. Open the menu **Tools/Rules Wizard**.
4. Click on the button **New**.

   The Rules Wizard opens, in order to set new rules. The Rules wizard now leads you step-by-step through the configuration.
5. Which type of rule do you want to create? (step 1)

   Select the rule **Check messages when they arrive**.

   Then click on the button **Next**.
6. Which condition(s) do you want to check? (step 2)

   In this window, select the condition **with specific words in the message header**.

   In the window **Rule description** click on the underlined portion of text and type the header's name into the input field **Search text**. Example: **X-Spam-Score**

   Then click on the button **Next**.
7. What do you want to do with message? (step 3)

   Define in this window, what has to be done with the filtered e-mail. If for instance, you want to move the filtered e-mails to a specific folder, select the action **move it to a specified folder**.

   With one click on **Specified folder** in the window **Rule description**, a new menu appears. Here you can either choose an existing folder or create a new destination folder for the filtered e-mails. Example: **Spam**

   Click **OK** to save the new settings in this menu.

   Then click on the button **Next**.
8. Add exceptions (step 4)

   The module **Spam Detection** heuristically checks incoming e-mails for certain characteristics. It therefore might be that safe messages, e. g. HTML-Newsletter are filtered. This menu allows you to define exceptions and to thus exclude e-mails, e. g. messages of a particular sender from this rule.

   Then click on the button **Next**.

**9.** Enter a name for this rule (step 5)

Type a distinct name for this rule into the input field. In the options fields below, you can **activate** these rules and also apply them on e-mails, which are already in the **Inbox** folder. You can change your settings in the window Rule description.

Then click on the button **Finish**.

**10.** Apply rules in the following order (step 6)

In the Rules Wizard you can activate or deactivate the rules by one click on the option field or execute changes.

In order to close the Rules Wizard, click on the button **OK**.

#### SMTP Authentication


The **Require TLS Connection** function allows you to specify if appropriate encrypted connections should be required. TLS for incoming connections is always turned on and the proxy will use strong encryption automatically if the remote host supports this function. SMTP is generally not encrypted and can easily be read by third persons. The function should therefore be enabled.

**Important Note:**

Some mail servers, such as Lotus Domino, use non-standard implementations of **TLS**. While these servers claim to support TLS during connection negotiation, they cannot establish a TLS full session. If TLS is enabled, it will not be possible to send messages to these servers. In such situations, please contact the administrator of the mail server.

When configuring clients, please note that SPA (Secure Password Authentication) should not be used. SPA is an alternative encryption method which is not supported by Novell Security Manager. You should use an unencrypted authentication method instead, and use TLS (or SSL) to encrypt the session.

The **Authentication methods** selection menu allows you to select the user authentication method to be used. Only those authentication methods you have configured in the **Settings/User Authentication** menu are available here.

**Local users** are defined in the **Definitions/ Users** menu.

### Advanced Settings


**Trusted Hosts/Networks**: In the selection field a **Global Whitelist** can be defined with reliable hosts or networks, which in this case are excluded from the following options:

- MIME Error Checking
- Expression Filter
- Sender Address Verification
- Realtime Blackhole Lists (RBL)
- Spam Protection

This implicates, that the necessary computing power for scans is reduced and that problematic hosts can be excluded from Content Scanning.

**Trusted Senders**: with the hierarchical list trusted sender addresses can be excluded from the following functions:

- Greylisting
- Sender Verification

**Security Note:**

This function should only be used carefully, since sender addresses can easily be falsified.

**Max message size**: Enter the maximum message size for in- and outbound mail messages. Normal values are 20 or 40 MB. Please note that the encoding used to transmit e-mails can make the size of the message larger than the files sent.

**DoS Protection**: In order to protect Novell Security Manager against a **Denial of Service (DoS)** attack, a maximum of 20 incoming concurrent connections are supported. The 21$^{th}$ connection will not be accepted.
By default, the **DoS Protection** function is enabled.

**Outgoing TLS**: Incoming connections are always TLS-encrypted. This function is used to strongly encrypt outgoing connections. You must first confirm that the remote host supports this function. TLS is used for encryption, not just authentication. SMTP is generally not encrypted and can easily be read by third persons. The function should therefore be enabled.

**Important Note:**

Some mail servers, such as Lotus Domino, use non-standard implementations of **TLS**. While these servers claim to support TLS during connection negotiation, they cannot establish a TLS full session. If TLS is enabled, it will not be possible to send messages to these servers. In such situations, please contact the administrator of the mail server.

**Use Smarthost**: If you wish to use an **Upstream Smarthost** to deliver messages, enable this function and enter the IP address of the smarthost here. In this case, the proxy will not attempt to deliver messages itself, but will instead forward them to the smarthost. The proxy will, however, deliver messages locally to domains defined in the **Incoming Mail** window.

For the Smarthost the **Username** and **Password** can be defined as an option.

### 4.6.3. POP3

**POP3** stands for **Post Office Protocol 3**: This is a protocol, which allows the retrieval of e-mails from a mail server. POP3 is the logical opposite of **SMTP**. SMTP stands for Simple Mail Transfer Protocol. This protocol is used to deliver e-mails to a mail server.

This menu allows you to configure the **POP3 Proxy** for incoming e-mails. The POP3 proxy works transparently, requiring no configuration on the client side. POP3 requests coming from the internal network on port 110 are intercepted and redirected through the proxy. This process is not visible to the client. The advantage of this mode is that no additional administration or configuration is required on the client of the end user.

**Configuring the POP3 Proxy**:

Note that the drop-down menus contain only those networks you have already defined in the **Definitions/Networks** menu.

**11.** In the **Proxies** tab, open the **POP3** menu.

**12.** Click the **Enable** button next to **Status** to start the proxy.

An advanced entry window will open.

**13.** Use the **Allowed networks** selection menu to select which networks should be allowed to use the proxy.

In the **Skip Source/Destination Networks** selection field you have the possibility to exclude specific network segments or hosts from the allowed networks.

For a description of how to use the **selection field** please see chapter **Error! Reference source not found.** on page **Error! Bookmark not defined.**.

All settings take effect immediately and will be saved if you leave this menu. The HTTP proxy can now be accessed from the allowed networks.

#### 4.6.3.1. Content Filter

**Virus Protection**: This module scans e-mails and attachments passing through the proxy for dangerous contents such as viruses or Trojan horses. The results of the scan are inserted into a header of the message. Any messages blocked by the proxy will be shown in the **Proxies/Proxy Content Manager** menu. Enable the **Virus Protection** by clicking on the **Enable** button (status light is green).

**Spam Protection**: This module heuristically checks incoming e-mail for characteristics suggestive of spam. This system uses an internal database of heuristic tests and characteristics, making the test independent from sender information, and also more reliable.

**Important Note:**

When you use an upstream firewall, it must allow traffic from the security system to the Internet on the following ports. They are used for communication to the **Spam Protection** databases:
TCP Port 2703, UDP Port 6277, UDP Port 53 (DNS)

Two **Thresholds** can be defined for the Spam Score. This ensures that potential SPAM e-mails are treated differently by the Firewall.

**Default settings**:

**Thresholds**

**Pass when Score exceeds**: 03 (aggressive)

**Quarantine when Score exceeds**: 05 (reasonable)

The first threshold implicates that e-mails from level 3 on are filtered, but allowed through. With the help of the attached Header the e-mail on the mail server or in the e-mail program of the recipient can be sorted or filtered. For the second threshold the e-mail will be accepted but put into quarantine.

Basically, the **Threshold** with the higher level is treated more severely.

**Important Note:**

On busy systems, the **Spam Protection** may require a large percentage of system resources.

**Pass/Quarantine when Score exceeds**: These drop-down menus can be used to select the strategy to use in marking messages as spam. The difference between the maximum values is defined through the probability that legitimates messages, such as HTML Newsletters will be blocked. It is possible to set a value between 1 and 15 in the drop-down menu. With

level 1, the e-mails are already treated with a low spam score. The following Levels serve as clue:

- **Aggressive (03)**: This strategy will catch most spam messages. It may also identify some legitimate messages, for example HTML newsletters, as spam.
- **Reasonable (05)**: This strategy is a compromise between **Aggressive** and **Reasonable**.
- **Conservative (08)**: This strategy will only catch messages that are highly likely to be spam. Legitimate messages are unlikely to be caught.

The following actions are preset:

- **Quarantine**: The e-mail will be accepted, but kept in quarantine. The **Proxy Content Manager** menu will list this e-mail with status **Quarantine**. This menu presents further options, including options to read or to send the message.
- **Pass**: The proxy will add a **Header** to the message noting that it has found a potentially dangerous string, but will then allow the message to pass. A **Header** will be added to the e-mail, by which it can be sorted or filtered on the mail server or in the e-mail program of the recipient. In addition, the word ***SPAM*** will be added to the message subject line.

  A description of how the rules are created in **Microsoft Outlook 2000** can be found on page **Error! Bookmark not defined.**.

**Message Style**: This drop-down-menu allows you to define the scope of the message for an e-mail put into quarantine. If all technical details are to be presented, set it to **Verbose**. With the **Normal** setting only the basic information such as the *sender* (*From*), the *subject* and the *date* will be displayed.

**The Header**:

Many of the SMTP proxy functions will add **headers** to the messages scanned. The Header will inform the user on specific characteristics of a message. If you select the **Pass** action, recipients can configure their e-mail programs to filter messages with high spam scores.
The following list contains all possible *Header*s:

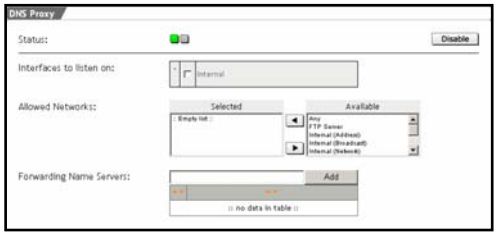
- **X-Spam-Score**: This header is added by the **Spam Protection** module. It contains a score, consisting of a numerical value and of a number of minus and plus characters. The higher the value, the more likely it is that the message is spam.
  If you select the **Pass** action under the **Spam Protection** module, recipients can configure their e-mail programs to filter messages with high spam scores.
- **X-Spam-Flag**: This header is set to **Yes** when the proxy classifies a message as spam.
- **X-Spam-Report**: The proxy identified a message as spam. The added Multiline Header contains a readable and accessible anti-spam report.

**Spam Sender Whitelist**: This control list can only be defined for the **Spam Protection** module. Enter the e-mail addresses of those senders into the list, whose messages you wish to allow through.

**File Extension Filter**: The firewall filters attachments with the extensions from the control list.

**Expression Filter**: This function allows to filter all e-mail texts and attached text files, that pass through the POP3 proxy by specific expressions. The expressions are defined in the check list in the form of **Perl Compatible Regular Expressions**.

### 4.6.4. DNS




The **DNS Proxy** service allows you to provide internal clients with a secure and efficient **name server** service. If you select multiple remote name servers, they will be queried in the order they are entered.

The DNS entries in network definitions are resolved every minute by the DNS resolver. If now a DNS entry refers to a Round-Robin-DNS, the definition can be actualized every minute. The Round-Robin-DNS process offers an easy opportunity to distribute user requests to individual servers, such as to a server farm. With the Round-Robin-DNS, the IP addresses of all servers of the server farm are assigned to a hostname in the *Domain*

*Name Service (DNS)*. If clients now request the IP address of this hostname there, the DNS sequentially reports these IP addresses back. Thus, a distribution of the client requests to the respective servers is achieved.
The disadvantage of the Round-Robin process is that neither a failure nor the utilization of the individual servers is accounted for.

If no name servers are entered in the **Forwarding Name Servers** menu, the proxy will use the Internet-wide ROOT name servers. If you or your ISP runs a name server that is closer, you should enter its IP address here. This means, however, that they are usually slower than closer name servers.
The ROOT name servers are an integral part of the Internet. 15 ROOT name servers are distributed worldwide and are the basic instance for all secondary name servers.

**Tip:**

Even if you do not plan to use the DNS proxy, you should enter the address of your provider's DNS server address as a forwarding server. Those will be used by the firewall itself, even if the proxy is disabled. This contributes to the discharge of the root name server and the firewall produces only local queries, which generally receive faster replies.

**Configuring the DNS Proxy**:

1. In the **Proxies** tab, open the **DNS** menu.
2. Click the **Enable** button to start the proxy.

   Another entry window will open.
3. Make the following settings:

   **Interfaces to listen on**: Select which network cards the DNS proxy server should be reachable on. This should usually only be the internal network cards.
   Network cards are configured in the **Network/Interfaces** menu. Further information is available in chapter 4.3.2 on page 93.

   A description of how to use the **selection table** can be found in chapter 3.3.3 on page 29.

   **Allowed Networks**: Select which networks should have access to the proxy server.

   **Security Note:**

   In the **Allowed Networks** menu, do not select **any** unless absolutely necessary. If **any** is selected, the **DNS proxy** can be used by any Internet user.

   A description of how to use the **selection field** can be found in chapter 3.3.2 on page 28.

**Forwarding Name Servers**: Enter the IP addresses of your name server here.
Click **Add** to add each name server to the list.

**Ordered Lists** are described in chapter 3.3.5 on page 30.

All settings take effect immediately and will be saved if you leave this menu.

#### 4.6.5. SIP

The **Session Initiation Protocol (SIP)** is a signalization protocol for the set-up, modification and termination of sessions between two or several communication partners. With the **SIP Proxy**, SIP devices can be operated behind the NAT Gateway. In fact the sessions can also directly run between the SIP clients, it is, however, not always guaranteed that a client can always be reached and that it always has the same IP address. Therefore, a SIP Client logs on to a SIP server in general, working as Proxy. The SIP proxy registers the IP address. If there is a call to the SIP address of the SIP client, the SIP address is resolved and it will be determined, where the client can be reached. Then the call and all other requests are forwarded to the client.
The SIP proxy thus works as mediator between local SIP clients and external SIP providers or clients. This does not only apply to the SIP-dataflow-control (the standard-port for SIP is 5060), but also to the streaming of audio data. The *Real-Time Transport Protocol* (*RTP*) is responsible for the transport of these real-time data.

The module has been successfully tested with the following SIP-providers: Free IP Call, Freenet, FWD, SimtTex, Sipgate, Stanaphone and Web.de.

**Defining a SIP Proxy**:

1. In the **Proxies** tab, open the **SIP** menu.
2. Enable the proxy by clicking the **Enable** button in the **SIP Proxy** window.

   An advanced entry window will open.
3. Make the basic settings:

   **Transparent Mode**: The SIP-proxy can be operated in transparent mode, to simplify the use of a proxy or also to be able to use SIP devices, for which it is not possible to configure an outbound-proxy. In this mode the complete data traffic is forwarded to the UDP Port 5060 to the proxy.

   **Debug Mode**: This function allows you to check the IPSec connection. Detailed information is logged to the SIP-proxy-logs. These protocols can be displayed in real time in the **Local Log/ Browse** menu or

downloaded to your local computer. The functions in the **Local Logs** menu are explained in more detail in chapter **Error! Reference source not found.** on page **Error! Bookmark not defined.**.

**Outgoing Interface**: Configure the primary external network card in this drop-down menu. Please remember that even if the security system is operated in the *Bridge Mode,* an IP address must be configured here.

Interfaces can be configured in the **Network/Interfaces** menu. For more information on **Bridging**, please, refer to chapter 4.3.3 on page 119.

**Allowed Networks**: Use this drop-down menu to select the networks, which are allowed to access this proxy. Limit the access to the networks within the LANs. The networks are defined in the in the **Definitions/Networks** menu.

**4.** Use the **Call Routing** window, to define how SIP-calls shall be executed.

### 4.1 Static SIP Route

If you wish to forward SIP calls statically, click on the **Add static SIP route** button.

Then a blank line will be added to the **Static SIP Route** table.

Open the entry field in the **SIP Domain** column by clicking on the standard setting and enter your domain (e. g. freenet.de). Click **Save** to save your settings.

Open the entry field in the **Target Host:Port** column by clicking on the message and enter the target-host and the port (e. g. iphone.freenet.de:5060). Click **Save** to save your settings.

The **static IP Routes** will be removed from the table, if you click on the trash can icon in the corresponding line.

### 4.2 DNS SRV/Host lookup

This setting is required to reach other SIP providers or clients. By default, this setting is disabled.

### 4.3 Smarthost

This setting can be used to define a special smarthost for the forwarding of SIP calls. Strictly speaking, this is a SIP proxy, which is controlled by the security system. If you have selected **Smarthost** in the drop-down menu to further entry menus will be displayed.

Save your settings by clicking on the **Save** button.

**5.** Make the advanced settings in the **Advanced** window.

**Local listening port**: By default, the UDP Port 5060 is set here. The **Transparent Mode** will not be affected by this setting. If this mode is enabled, the data transfer will only be redirected to the UDP Port 5060 to the configured *Local Listening Port*.

**RTP port range**: Each active SIP call requires two RTP ports for the transport of the audio data. Configure this port-range according to your demands. Please remember that the local SIP client will not be affected by this setting. By default, the port-range 16384:32766 is configured.

**RTP lifetime (seconds)**: Define here, after how many seconds a RTP-data stream shall be classified as inactive and interrupted. By default, this is set to 300 seconds.

Save your setting by clicking on the **Save** button.

The SIP-proxy is now operational. Now execute the settings on the SIP-devices. To learn more on the required settings please refer to the respective manuals.

**Note:**

Please remember that *SIP over TCP* is not supported. In addition to that the STUN function (Simple Traversal of UDP over NATs) must be disabled on the connected SIP-devices. As an alternative you can set a rule in the Packet Filter, so that the STUN service will be blocked. The packet filter rules are defined in the **Packet Filter/Rules** menu.

### 4.6.6. SOCKS


**SOCKS** is a generic proxy, used by many client applications. Examples include Instant Messaging Clients such as ICQ or AIM, FTP clients, and RealAudio. SOCKS can build TCP connections for client applications, and can also provide incoming (listening) TCP and UDP ports. This is especially important for systems using NAT, as SOCKS mitigates the drawbacks of having all internal clients use the same external address. Novell Security Manager supports the protocols SOCKSv4 and SOCKSv5.
Please note, however, that the SOCKSv4 protocol does not support **User Authentication**.

**Note:**

If you wish to use SOCKSv5 with name resolution, you must also activate the DNS proxy service.

**Configuring the SOCKS Proxy**:

1. In the **Proxies** tab, open the **SOCKS** menu.
2. Click the **Enable** button next to **Status** to start the proxy.

   Another entry window will open.
3. Make the following settings:

   A description of how to use the **selection field** can be found in chapter 3.3.2 on page 28.

   **Allowed Networks**: Here you can select the networks and hosts that should be allowed to use the proxy.

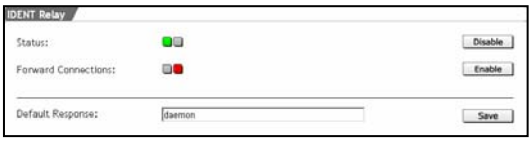
All settings take effect immediately and will be saved if you leave this menu.

**SOCKS-Proxy with User Authentication**:

If you have enabled the **User Authentication** function, proxy users must use a username and password to log into the SOCKS proxy. Because only SOCKSv5 supports **User Authentication**, SOCKSv4 is automatically disabled.

The **Authentication Methods** selection menu allows you to select the user authentication method to be used. Only those authentication methods, you have configured in the **Settings/User Authentication** menu are available here. If you choose to use the **Local Users** method, you can select which local users may access the **SOCKS Proxy**.
Local **Users** are managed in the **Definitions/Users** menu.

### 4.6.7. Ident




The **Ident** protocol allows external servers to associate a username with given TCP connections.

While this connection is not encrypted, it is nevertheless necessary for many **services**.

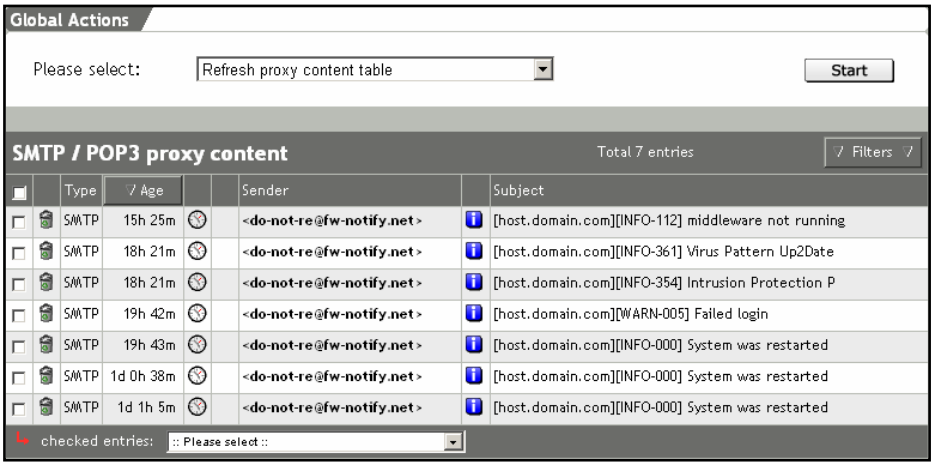
If you enable the **Ident** function, Novell Security Manager supports Ident queries. The system will always reply with the string that you define as **Default Response**, irrespective from which local service the connection will be started.

**Forward Connections**: Ident queries cannot be answered through **Connection Tracking**. You can get around this difficulty if you use the **Masquerading** function: in that case, the **Forward Connection** function will pass the ident request on to the internal **masquerading** host.
Please note, however, that the actual (internal) IP address will not be released. Instead, the system will query the internal machine, and simply pass the response string to the remote server. This is often useful for internal clients with a mini-ident server, such as the ones often included in IRC and FTP clients.

### 4.6.8. Proxy Content Manager

The **Proxy Content Manager** menu allows you to manage all of the e-mails quarantined by the proxy, as well as those which, because of an error, the system was unable to forward.

This menu uses the following concepts to display and manage the e-mails:




**ID**: Every e-mail in Novell Security Manager contains a unique **ID**. This **ID** is contained in the header of the message, and is used by the system to identify messages in the log files. The **ID** will be displayed, when you touch the entry in the **Type** field with the mouse.

**Type**: Proxy Content Manager distinguishes between the **POP3** and **SMTP** types of filtered e-mail: If you touch the entry with the mouse, the **Mail-ID** will be displayed. Clicking on the entry opens a window with the content of the message. Thus you can safely read important messages. Messages of a length of up to 500 lines will be displayed completely.

**Age**: This column displays the age of an e-mail, i.e., the period of time since when the e-mail has arrived to Novell Security Manager.

**Status**: The states of the e-mails are displayed in the Proxy Content Manager through symbols.

- **deferred** (): The e-mail will be sent to the intended recipient. Normally, messages of this type are forwarded soon after the proxy receives them. If, however, temporary problems delivering the message are encountered, it may remain in the queue with this status for a short while. Such messages will be delivered as soon as the destination host can be contacted.
- **quarantined** (): The e-mail will be quarantined due to the **Quarantine** configuration to one of the **Content Filter** functions. Unwanted or dangerous content such as a virus have been discovered in the message. Such messages will remain in the table until an administrator deletes or sends them.

On the right side, next to the status symbol for those e-mails, which are kept in quarantine, it is displayed which function blocked the message:

**SP**: Spam Protection

**VP**: Virus Protection

**Filter**: File Extention Filter

**EXP**: Expression Filter

**MIME**: MIME Error Checking

- **permanent error** (): The e-mail contains a permanent error.

**Sender**: The sender of an e-mail is displayed in this column. For the *SMTP* type, this is the sender address on the envelope.
For the *POP3* type, this is the address of the *„From:"*-header of an e-mail. If no sender address is displayed, the e-mail contains the additional status **Bounce**.

If the Content Filter has blocked an e-mail which might be a **Phishing Mail**, this will be indicated if you touch the cell with the VP message with the mouse.

With **Phishing Mails** fraudsters lure Internet users to false websites and request the visitors to enter information on their passwords and access information on their online banking.

**Recipient(s)**: The recipient of an e-mail is displayed in this column. For the *SMTP* type, this is the recipient's address on the enveloppe. For e-mails with the **deferred** status, the delivery status will be displayed separately for each recipient: Deferred () or permanent error ().

The drop-down menu at the bottom of the table shows further functions to manage single e-mails. Click the selection box next to an e-mail to manage it.

The following functions are available:

**Delete**: All chosen e-mails will be deleted.

**Force delivery**: All chosen e-mails will be forwarded to the recipient addresses, even those having a **quarantined** status. For e-mails with a **deferred** or **permanent error** status, it is being tried again to deliver the message. If the system encounters another problem delivering it, the message will return to its previous status.

**Download as .zip file**: The chosen e-mails are packed into a zip-file and then saved to the selected local host.

#### Global Actions

In order to save disk space on Novell Security Manager, you can use this option to delete all messages of a certain type. E-Mails being sent or

forwarded while the system is deleting messages will not be affected. From the **Please select** drop-down menu, select the type and start the action by clicking on the **Start** button.

If you wish to actualize the **SMTP/POP3 Proxy Content** table, select the **Refresh proxy content table** action from the **Please select** drop-down menu.

**Attention:**

Messages of the selected type will be deleted without further confirmation.

#### Filters

The **Filters** function allows you to filter *E-Mails* with specific attributes from the table. The function facilitates the management of huge networks, since the protocols of a specific type can be presented in a concise way.

**Filtering e-mails**:

1. Click on the **Filters** button.

   The entry window will open.

2. Enter the filter attributes in the following fields. Not all attributes have to be defined.

   **Type**: If you wish to filter e-mails of a specific type, select them from the drop-down menu.

   **Status**: If you wish to filter e-mails of a specific status, select them from the drop-down menu.

   **Content Filter Type**: This drop-down menu allows you to filter e-mails, that have been filtered by a specific function from the **Content Filter**.

   **Sender**: This drop-down menu allows you to filter e-mails with a specific sender address.

   **Recipient(s)**: This drop-down menu allows you to filter e-mails with a specific recipient address.

3. Click the **Apply Filters** button to start the filter.

In this case, only the filtered e-mails will be displayed in the table. Once the menu has been left, all protocols will be displayed again.

### Automatic Cleanup

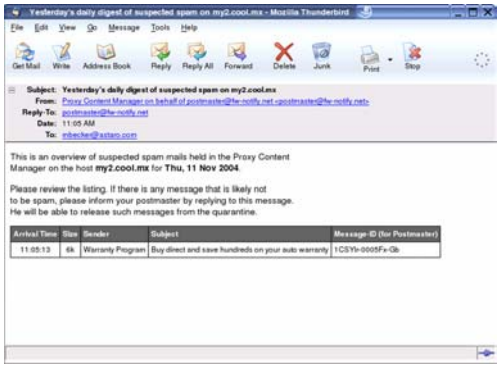

In order to save disk space on Novell Security Manager, you can use this option to delete e-mails automatically. Enable the function by clicking the **Enable** button in the **Status** line (status light shows green).

**Mode**: Configure the mode in this drop-down menu. The following modes are available:

- **Cleanup by message age**: This mode deletes all old e-mails from a certain age on.
  Enter the maximum age in days into the **Maximum Message Age (days)** entry field.
- **Cleanup by message count**: As soon as there is a specific amount of e-mails, older e-mails will be deleted. By default, this is set to 500 e-mails. It shouldn't be configured to less than 200.

Save the settings by clicking on the **Save** button. The action will then be executed once per hour, so that the maximum level is only exceeded for short periods.

### Daily Spam Digest


This **Daily Spam Digest** function causes the system to send a daily digest of the proxy content manager to the internal recipients by e-mail, informing them which incoming emails have been put into quarantine within the last 24 hours. The notification includes a list of e-mails providing information on arrival time, size, sender, subject, and message-ID (for Postmaster) sorted in inverse chronological order, beginning with the newest:

Enable the function by clicking the **Enable** button in the **Status** line (status light shows green).

**Domains**: Select the domains for which the daily digest of quarantined messages should be called. All here available domains must have previously been defined on the **Proxies/SMTP** menu.

**Skip Addresses**: If you want to exclude certain members of your domain from receiving the daily digest, enter their full e-mail addresses into the control list.

The function of the **Control List** is identical to the **Ordered List** and described in chapter 3.3.5 on page 30.

## 4.7. Virtual Private Networks (IPSec VPN)

A **Virtual Private Network (VPN)** is a secure connection between two networks over an untrusted network (such as the Internet).
**VPN**s are very useful when sensitive information must be transmitted or received over the Internet. The VPN prevents third parties from reading or modifying the information in transit. The connection is controlled and secured by the software installed at the connection endpoints. This software implements authentication, key exchange, and data encryption according to the open **Internet Protocol Security (IPSec)** standard.

Only authenticated computers can communicate through a **VPN**-protected connection. No other computer can transmit information over this connection.
VPN connections can be established between two hosts, one host and one network, or two networks. When one endpoint is a single computer, the VPN connection will extend all the way to that computer, where the data is encrypted and decrypted. If one end point is a network, the connection will end at a **Security Gateway**, which manages the VPN functions for the rest of the network. The data transmission within the network, between the security gateway and client computers, is not encrypted.
Data transfer between two computers over a **Public Wide Area Network (WAN)** uses public routers, switches, and other network components. This is, in general, not secure as messages can be read in clear text at every point between the end computers. An **IPSec VPN**, however, builds a secured **IP Security (IPSec)** tunnel through the public **WAN**. Messages sent through this tunnel cannot be read.

An **IPSec** tunnel consists of a two directional **Security Associations (SAs)**, one for each direction of communication.

An **IPSec SA** consists of three components:

- the **Security Parameter Index (SPI)**,
- the IP address of the receiver,
- a **Security Protocol Authentication Header (AH)** or **Encapsulated Security Payload (ESP)**.

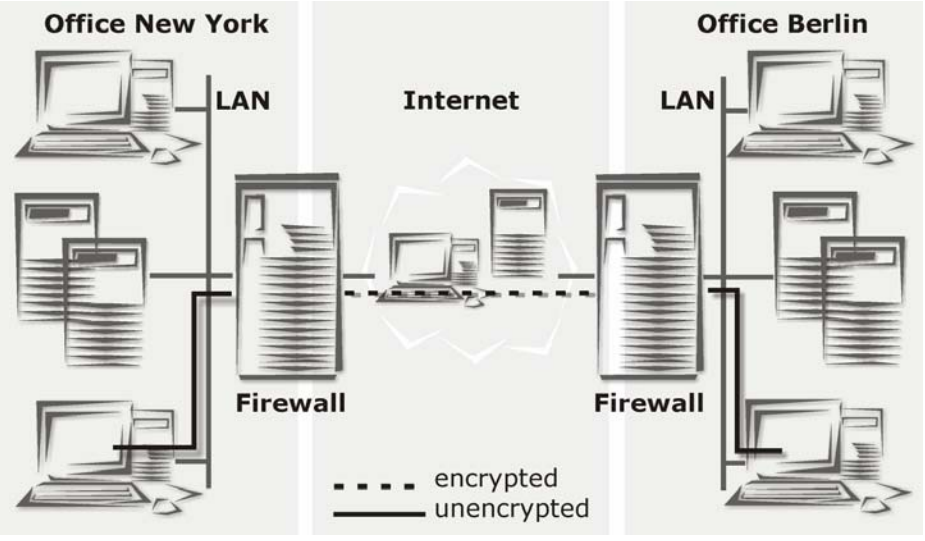
With the help of the **SA**, the **IPSec VPN** tunnel has the following features:

- Data confidentiality through encryption
- Data integrity through data authentication
- Sender authentication through PSK, RSA, or X.509 certificates

The security features can be combined as desired. Most administrators use at least the encryption and authentication components.

There are a few scenarios where IPSec VPNs can be used:

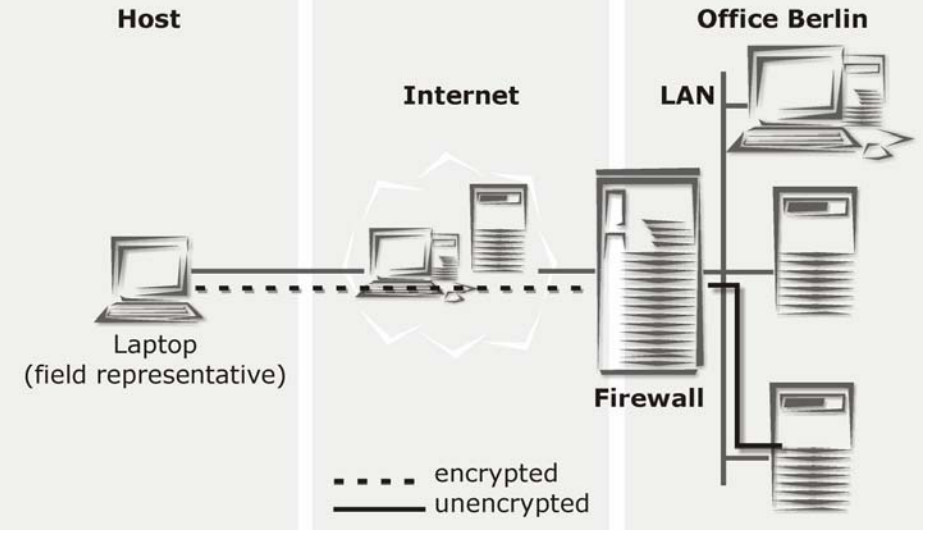
**1. Net-to-Net Connection**




In this scenario, one network communicates with another.
Two remote offices can use a VPN tunnel to communicate with each other as though they were on a single network.

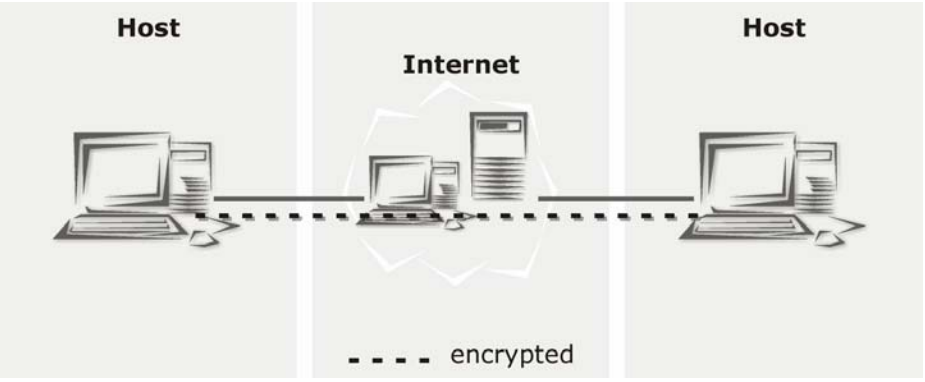
This kind of connection can also be used to allow trusted third companies (e.g., consultants and partner firms) access to internal resources.

**2. Host-to-Net Connection**




In this scenario a single computer communicates with a network.
Telecommuters can use VPN to communicate with the main office securely.

### 3. Host-to-Host Connection



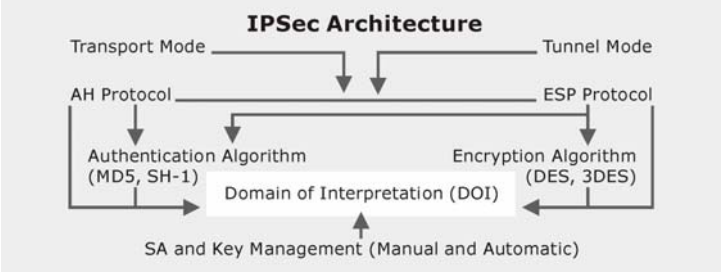

In this scenario one computer communicates with another computer.
Two computers can use a VPN tunnel to communicate securely over an untrusted network.
A VPN server is a cost effective and secure solution for transferring sensitive data, and can replace existing expensive direct connections and private lines.

#### The IPSec Concept

IP Security (IPSec) is a suite of protocols designed for cryptographically secure communication at the IP layer (layer 3, see also chapter 1).
The IPSec standard defines two service modes and two protocols:

- **Transport Mode**
- **Tunnel Mode**
- **Authentication Header (AH)** Authentication protocol
- **Encapsulated Security Payload (ESP)** Encryption (and Authentication) protocol

**IPSec** also offers methods for manual and automatic management of **Security Associations (SAs)** as well as key distribution. These characteristics are consolidated in a **Domain of Interpretation (DOI)**.

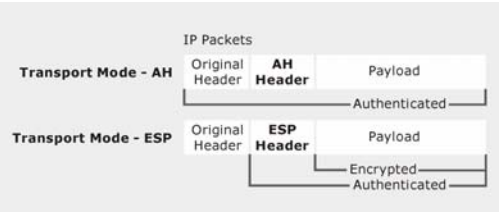


**Note:**

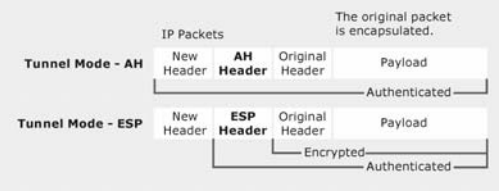
Novell Security Manager uses the **Tunnel Mode** and the **Encapsulated Security Payload (ESP)** protocol.

#### IPSec Modes

IPSec can work in either **Transport Mode** or **Tunnel Mode**. In principle, a host-to-host connection can use either mode. If, however, one of the end-points is a security gateway, the Tunnel Mode must be used. The IPSec VPN connections on Novell Security Manager always use the Tunnel Mode.




In **Transport Mode**, the original IP packet is not encapsulated in another packet. The original IP header is retained, and the rest of the packet is sent either in clear text **(AH)** or encrypted **(ESP)**. Either the complete packet can be authenticated with **AH**, or the payload can be encrypted and authenticated using **ESP**.
In both cases, the original header is sent over the WAN in clear text.




In **Tunnel Mode**, the complete packet – header and payload – is encapsulated in a new IP packet. An IP header is added to the IP-packet, with the destination address set to the receiving tunnel endpoint. The IP addresses of the encapsulated packets remain unchanged. The original packet is then authenticated with **AH** or encrypted and authenticated using **ESP**.

#### IPSec-Protocols

IPSec uses two protocols to communicate securely on the IP level.

- **Authentication Header (AH)** – a protocol for the authentication of packet senders and for ensuring the integrity of packet data
- **Encapsulating Security Payload (ESP)** – a protocol for encrypting the entire packet and for the authentication of its contents.

The **Authentication Header**-Protocol **(AH)** checks the authenticity and integrity of packet data. In addition, it checks that the sender and receiver IP addresses have not been changed in transmission. Packets are authenticated using a checksum created using a Hash-based Message Authentica-

tion Code (HMAC) in connection with a key. One of the following hashing algorithms will be used:

**Message Digest Version 5 (MD5)** This algorithm generates a 128-bit checksum from a message of any size. This checksum is like a fingerprint of the message, and will change if the message is altered. This hash value is sometimes also called a **digital signature** or a **message digest**.
The **Secure Hash (SHA-1)** algorithm generates a hash similar to that of **MD5**, though the SHA-1 hash is 160 bits long. **SHA-1** is more secure than **MD5**, due to its longer key.
Compared to **MD5**, an **SHA-1** hash is somewhat harder to compute, and requires more CPU time to generate. The computation speed depends, of course, on the processor speed and the number of **IPSec VPN** connections in use at the **Security Gateway**.

In addition to encryption, the **Encapsulated Security Payload** protocol **(ESP)** offers the ability to authenticate senders and verify packet contents. If **ESP** is used in **Tunnel Mode**, the complete IP packet (header and payload) is encrypted. New, unencrypted IP and ESP headers are added to the encapsulating packet: The new IP header contains the address of the receiving gateway and the address of the sending gateway. These IP addresses are those of the VPN tunnel.

For **ESP** with encryption normally the following algorithms are used:

- Triple Data Encryption Standard (3DES)
- Advanced Encryption Standard (AES)

Of these, AES offers the highest standard of security. The effective key lengths that can be used with AES are 128, 192 and 256 Bits. Novell Security Manager supports a number of encryption algorithms.

Either the MD5 or SHA-1 algorithms can be used for authentication.

#### Key Management

The secure generation, management, and distribution of keys is crucial to the security of IPSec connections. IPSec supports both manual and automatic key distribution.

**Manual key distribution** requires that both sides of the connection be configured by hand. This means that for every **Security Association (SA)** (there are two per tunnel), a **Security Parameter Index (SPI)** must be selected, a key for encryption and authentication must be generated, and the keys must be installed on both sides of the tunnel. These keys should also be changed at regular intervals.
Clearly, manual distribution is labor-intensive. Because of the complexity of the process, manual intervention intensifies the risk that an unauthorized party gains access to the keys.
For these reasons, **Manual Key Distribution** is not often used.

The **Internet Key Exchange (IKE)** protocol provides **IPSec** with automatic key management capabilities. Keys are automatically generated and securely exchanged. **IKE** also allows the generation and management of multiple VPN tunnels and the use of dynamic IP addresses. The **IKE** protocol automatically manages the **Security Associations (SAs)** for a connection.

This system supports three kinds of authentication for IKE:

- IKE with Preshared Keys (PSK)
- IKE with RSA Keys (RSA)
- IKE with X.509v3 Certificates (X.509)

Authentication with **Preshared Keys (PSK)** uses secret passwords as keys – these passwords must be distributed to the endpoints before the connection is built. When a new VPN tunnel is built, each side checks that the other knows the secret password. The security of such **PSK**s depends on how "good" the passwords used are: common words and phrases are subject to dictionary attacks. Permanent or long-term IPSec connections should use certificates or RSA keys instead.

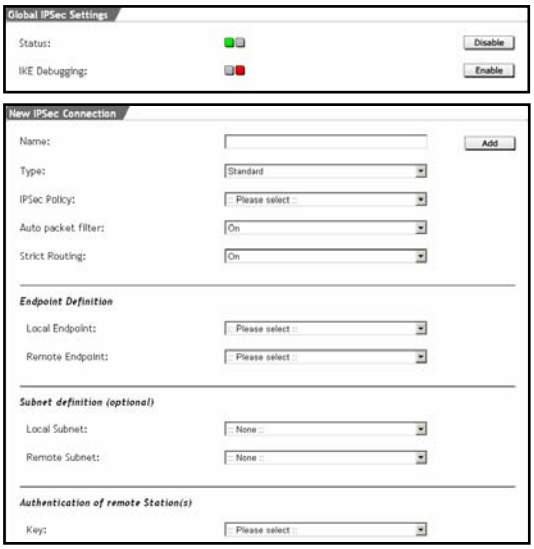
Authentication via **RSA Keys** is much more sophisticated. In this scheme, each side of the connection generates a key pair consisting of a **Public Key** and a **Private Key**. The **private key** is necessary for the encryption and authentication during the **Key Exchange**. Both keys are mathematically independent from each other and are in a unique relation to each other: Data encrypted with one key can only be decrypted with the other. The **Private Key** cannot be deducted with maintainable work from the **Public Key**.
Both receivers of an IPSec VPN connection require in this authentication method their own **Public Key** and **Private Key**.

Similarly, the **X.509 Certificate** authentication scheme uses **public keys** and **private keys**. An X.509 certificate contains the **public key** together with information identifying the owner of the key. Such certificates are signed and issued by a trusted **Certificate Authority (CA)**. During the **Key Exchange** process, the certificates are exchanged and authenticated using a locally stored CA certificate.
Further information on **Certificate Authorities (CAs)** can be found in chapter 4.1.9 on page 72 and in chapter 4.7.6 on page 241.

### 4.7.1. Connections

The **Connections** menu allows you to configure local settings for new **IPSec VPN** tunnels and to manage existing connections.

#### Global IPSec Settings




This section allows you to enable or disable the **IPSec VPN** system by clicking the **Enable**/ **Disable** button next to **Status**.

**IKE Debugging**: This function allows you to check the IPSec connection. Detailed information is logged to the IPSec logs. These protocols can be displayed in real time in the **Local Log/Browse** menu or downloaded to your local computer. Further information on the **Local Logs** menu can be found in chapter 4.9 on page 254.

**Important Note:**

The **IKE Debugging** function requires a large amount of system resources, and can slow the IPSec VPN connection building process down considerably. This system should only be enabled when IKE is actively being debugged.

#### IPSec Connections

In the **IPSec Connections** table, all current VPN connections are listed.

#### IPSec Connection Status

In the **IPSec Connection Status** table, all current negotiated or established IPSec-VPN connections are listed. A connection is then fully established, when the status lights in the **IPSec SA** and **ISAKMP SA** columns are both green. The table contains the following messages:

**Connection Name**: The name for the IPSec VPN connection.

**IPSec SA**: Indicates the IPSec SA status: red = inactive, yellow = being negotiated, green = set-up.

**ISAKMP SA**: Indicates the ISAKMP SA status: red = inactive, yellow = being negotiated, green = set-up.

**Connection Type**: The connection type, defined in the **WebAdmin** configuration tool.

**VPNid/Remote Gateway**: The remote *VPN ID* (if no IP address) and the current IP address of the receiver.

#### IPSec System Information


**VPN Status**: In the **VPN Status** window, status information is shown for active encryption algorithms, all active IPSec connections, and detailed information about every **Security Association (SA)**.

**VPN Routes**: The **VPN Routes** window shows all active IPSec SA connections. If no entries exist here, no IPSec connections are active.

Routing entries follow the following form:

```
A B                  -> C                => D

3 192.168.105.0/24 -> 192.168.104.0/24 => %hold

8 192.168.105.0/24 -> 192.168.110.0/24 => %trap

0 192.168.105.0/24 -> 192.168.130.0/24 =>
                      tun0x133a@233.23.43.1
```

Column **A**: The number of packets in this VPN connection.

Column **B**: The local subnet or host.

Column **C**: The remote subnet or host.

Column **D**: The status of the connection.

**%trap**: The connection is idle and is waiting for a packet. The status initiates the end of the VPN connection.

**%hold**: The connection is being negotiated. All packets will wait until the VPN tunnel is established (UP).

**tun0x133a@233.23.43.1**: Messages like these show that the tunnel is up.
A VPN tunnel with ID `0x133a` has been established, and the IP address of the **Remote Endpoint** is `233.23.43.1`.

**Example**:

```
A B                  -> C                => D

23 192.168.105.0/24 -> 192.168.104.0/24 =>
                       tun0x1234@123.4.5.6
```

This message shows that 23 data packets have been sent from network `192.168.105.0/24` to network `192.168.104.0/24`. The tunnel's ID number is `0x1234`, and the remote endpoint is has IP address `123.4.5.6.`.

**Configuring an IPSec Connection**:

1. Under the **IPSec VPN** tab, open the **Connections** menu.
2. Enable the option by clicking the **Enable** in the **Global IPSec Settings** window.

   The **New IPSec Connection** window will open.
3. In the **Name** field, enter a descriptive name for the new IPSec VPN connection:

   **Name**: Enter a descriptive name for this IPSec-VPN tunnel. Allowed characters are: Only alphanumeric and underscore characters are allowed.

   **Type**: Choose the type of connection to use.

   Use **Standard** for **Net-to-Net** connections.

   The **Road Warrior**, **Road Warrior CA** and **MS Windows L2TP IPSec** connection types are useful with **HOST-to-NET** connections, e.g. for sales representatives. The telecommuter will then be able to build an IPSec connection to the firm's internal network. A road warrior connection can only be used through a **default gateway**.

   **Note:**

   Multiple remote key objects can be added to a single road warrior connection. This can serve to reduce configuration hassles. It must be respected, however, that all road warriors use the same type of authentication (PSK, RSA or X.509) – a mixed operation can result in malfunctions.

   Further configuration parameters can be set for the chosen connection type.
4. Make the following basic settings for the IPSec-VPN connection.

   **IPSec Policy**: The policy controls the parameters for the VPN connection. This includes the settings for **Key Exchange, IKE,** and the **IPSec** connection.

   The drop-down menu contains a number of pre-defined policies. You can define custom ones in the **IPSec VPN/Policies** menu.

   **Note:**

   A standard policy is used for the **MS Windows L2TP IPSec** type of connection.

The configuration of **IPSec Policies** is detailed in chapter 4.7.2 on page 232.

**Auto Packet Filter**: Once the IPSec-VPN connection is successfully established, the packet filter rules for the data traffic will automatically be added. After the completion of the connection, the packet filter rules will be removed.

The **Auto Packet Filter** function is available for the **Standard** and **road warrior** connection types.

**Security Note:**

If you want greater control over the packet filter rules, or wish to manage them in a more centralized way, disable the **Auto Packet Filter** function and enter the rules manually in the **Packet Filter/Rules** menu.

**Strict Routing**: When this function is enabled (**On**), VPN Routing is not only done with the destination address, but in harmony with the source and destination address.
If *Strict Routing* is enabled, it is possible to simultaneously set encrypted and decrypted connections from different source addresses to one network.

If the **Strict Routing** function is disabled (**Off**), further networks and hosts can be connected to the IPSec-VPN tunnel through the setting of **Source NAT** rules.

The **Strict Routing** function can only be disabled or enabled in the **Standard** type of connection. For all other types of connections the function is always enabled!

5. In the **Endpoint Definition** window, select the endpoint of the IPSec tunnel.

   **Local Endpoint**: Use the drop-down menu to select the local endpoint. Always choose the network interface on the same side of the firewall as the remote endpoint.

   **Remote Endpoint**: Choose the remote endpoint here.
   With the *Road Warrior* or *MS Windows L2TP IPSec* types of connection, the remote endpoint has always a dynamic IP address.

6. The **Subnet definition (optional)** window allows you to set an optional subnet for both endpoints.

   **Local Subnet**: Choose the local subnet here.

   **Remote Subnet**: Choose the remote subnet here.

   With a **road warrior** connection, only the local subnet can be configured. This is no more possible if you additionaly enable the **L2TP Encapsulation** function in step 7.

**Note:**

With the **MS Windows L2TP IPSec** connection this window will not be displayed. The IPSec-VPN access will be managed through the **Packet Filter**.

7. Select the associated **key** in the **Authentication of Remote Station(s)** window.
IPSec remote keys are defined in the **IPSec VPN/Remote Key** menu. The settings in this window depend on the type of connection.

**7. 1 Standard**

**Key**: Use the drop-down menu to select a **Remote Key**.

**7.2 Road Warrior**

**L2TP Encapsulation**: This drop-down menu allows you to additionally enable **L2TP over IPSec** (**On**).

**Keys**: Select the **Remote Keys** for the road warrior connection from the selection window.

**7.3 Road Warrior CA**

**L2TP Encapsulation**: This drop-down menu allows you to additionally enable **L2TP over IPSec** (**On**).

**Use CA**: With the r*oad warrior CA* connection type, the authentication is based on the **Distinguished Name** (**DN**) of the remote receiver (**Remote Endpoint**). You thus need a **Certificate Authority (CA)** from this endpoint. Only the VPN Identifier **X.509 DN** can be used.

From the drop-down menu, select **X.509 DN Certificate Authority (CA)**.

**Client DN Mask**: In order to use a **Distinguished Name** as an ID, you will need the following information from the X.509 index: Country (C), State (ST), Local (L), Organization (O), Unit (OU), Common Name (CN) and E-Mail Address (E).
The data in this entry field must be in the same order as in the certificate.

**7.3 MS Windows L2TP IPSec**

**L2TP Encapsulation**: With this type of connection, **L2TP over IPSec** is automatically enabled (**On**).

**IPSec Shared Secret**: With the *MS Windows L2TP IPSec* connection type, the authentification is based on Preshared Keys.
Enter the password into this entry field.

8. Save these settings by clicking **Add**.

The newly configured IPSec profile will appear, deactivated, at the bottom of the table (status light is red). Clicking on the status light enables the IPSec connection.

After you configure a new VPN tunnel, you will need to establish the related packet filter rules to allow the two computers to communicate.
Configuring packet filter rules is described in chapter 4.4 on page 140.

**Example**:

In order to set-up a Net-to-Net VPN connection (between network 1 and network 2), you will need to define the following rules:

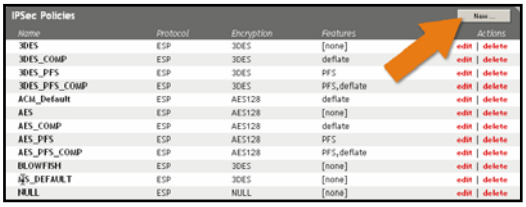
1. Under the **Packet Filter** tab, open the **Rules** menu.
2. In the **Add Rules** window, add the following rule for network 1:

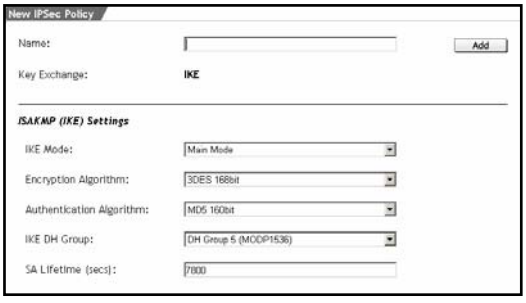
   **Source**: Network1
   **Service**: Any
   **Destination**: Network 2
   **Action**: Allow
3. Confirm the entries by clicking on **Add Definition**.
4. In the **Add Rules** window, add the following rule for network 2:

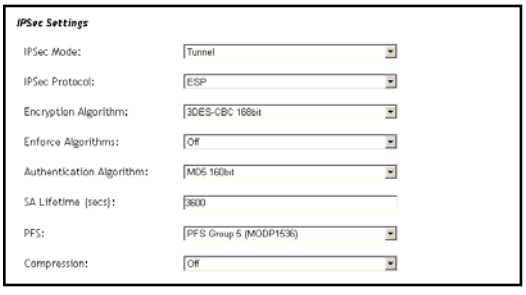
   **Source**: Network 2
   **Service**: Any
   **Destination**: Network1
   **Action**: Allow
5. Confirm the entries by clicking on **Add Definition**.

These rules will allow complete access between the two networks.

### 4.7.2. Policies




In the **Policies** menu, you can customize parameters for IPSec connections and collect them into a policy. Policies are used to define IPSec connections, and contain the configuration of the selected **key exchange** method, **IKE**, and the **IPSec** connection.

The chosen **key exchange** method defines how the keys for the connection are to be managed.

The two exchange methods are:

- Manual Key Exchange
- Internet Key Exchange (IKE)

Because of the complexity of manual exchange, this system only supports the IKE key exchange method. Manual exchange is not allowed.

**Configuring an IPSec Policy**:

1. Under the **IPSec VPN** tab, open the **Policies** menu.
2. Click **New** to open the **New IPSec Policy** menu.
3. In the **Name** field, enter a name for the new policy:

   **Name**: Enter a name describing the policy. It may be useful to include the encryption algorithm in the name. The name can also be defined as the last step in creating the policy.

   **Key Exchange**: Only **IKE** is supported.
4. In the **ISAKMP (IKE) Settings** window, configure the settings for IKE:

   **IKE Mode**: The IKE mode is used to support key exchange. At the moment, only the **Main Mode** is supported.

   **Encryption Algorithm**: The encryption algorithm is the algorithm used to encrypt IKE connections. The IPSec VPN function of Novell Security Manager supports **1DES 56bit**, **3DES 168bit**, **AES (Rijndael) 128bit**, **AES Rijndael 192bit**, **AES Rijndael 256bit**, **Blowfish**, **Serpent 128bit** and **Twofish**.

**Authentication Algorithm**: The hashing algorithm ensures the integrity of the IKE messages. The **MD5 128bit**, **SHA1 160bit**, **SHA2 256bit** and **SHA2 512bit** algorithms are supported. The algorithm used is determined by the remote endpoint of the IPSec connection.

**Important Note:**

The **SHA2 256bit** and **SHA2 512bit** algorithms require a great deal of system resources.

**IKE DH Group**: The IKE group (Diffie-Hellmann group) describes the kind of asymmetric encryption used during key exchange. The IPSec VPN system on Novell Security Manager supports the **Group 1 (MODP768)**, **Group 2 (MODP 1024)**, **Group 5 (MODP 1536)**, **Group X (MODP 2048)**, **Group X (MODP 3072)** and **Group X (MODP 4096)** protocols. The group used is determined by the remote endpoint.

**SA lifetime (secs)**: This option allows you to set the lifetime of IKE sessions in seconds. This is set by default to 7800 seconds (2h, 10 min).
In general, times between 60 and 28800 seconds (1 min to 8 hours) are allowed.

5. In the **IPSec Settings** window, configure the settings for the IPSec connection:

   **IPSec Mode**: This system only supports **tunnel mode**.

   **IPSec Protocol**: This system only supports **ESP**.

   **Encryption Algorithm**: Choose the encryption algorithm to use here. The IPSec VPN function of Novell Security Manager supports **1DES 56bit**, **3DES 168bit**, **AES (Rijndael) 128bit**, **AES Rijndael 192bit**, **AES Rijndael 256bit**, **Blowfish**, **Serpent 128bit** and **Twofish**. If you wish to create IPSec connections without encryption, choose **null** here.

   **Enforce Algorithm**: If an IPSec gateway makes a proposition with respect to an encryption algorithm and to the strength, it might happen, that the gateway of the receiver accepts this proposition, even though the IPSec Policy does not correspond to it. In order to avoid this, **Enforce Algorithm** must be enabled.

   **Example**:

   The IPSec Policy requires AES-256 as encryption. Whereas a road warrior with **SSH Sentinel** wants to connect with AES-128. Without **Enforce Algorithm** the connection will be admitted, which constitutes a security risk.

   **Authentication Algorithm**: The **MD5 128bit**, **SHA1 160bit**, **SHA2 256bit** and **SHA2 512bit** algorithms are supported. The algorithm used is determined by the remote endpoint of the IPSec connection.

**Important Note:**

The **SHA2 256bit** and **SHA2 512bit** algorithms require a great deal of system resources.

**SA Lifetime (secs)**: This option allows you to set the lifetime of the IPSec connection. This is set by default to 3600 seconds (1h). In general, times between 60 and 28800 seconds (1 min to 8 hours) are allowed.

**PFS**: The IPSec key used for VPN connections is generated from random numbers. When **Perfect Forwarding Secrecy (PFS)** is enabled, the system will ensure that the numbers used have not already been used for another key, such as for an IKE key. If an attacker discovers or cracks an old key, he or she will have no way of guessing future keys.

The IPSec VPN system on Novell Security Manager supports the **Group 1 (MODP768)**, **Group 2 (MODP 1024)**, **Group 5 (MODP 1536)**, **Group X (MODP 2048)**, **Group X (MODP 3072)** and **Group X (MODP 4096)** protocols. If you do not wish to use **PFS**, select **No PFS**.

By default, this is set to Group **5 (MODP 1536)**.

**Important Note:**

**PFS** requires a fair amount of processing power to complete the **Diffie-Hellmann** key exchange. **PFS** is also often not 100% compatible between manufacturers. In case of problems with the firewall's performance or with building connections to remote systems, you should disable this option.

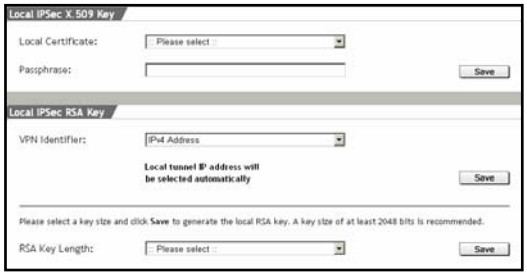
**Compression**: This algorithm compresses IP-packets before they are encrypted, resulting in faster data speeds.

This system supports the Deflate algorithm.

6. If you have not yet named this policy, scroll back to the **Name** field and enter one now.
7. Create the new policy by clicking **Add**.

The new **policy** will appear in the **IPSec Policies** table.

### 4.7.3. Local Keys




The **Local Keys** menu allows an administrator to manage local **X.509** certificates, to define the local IPSec identifier, and to generate a local RSA key pair.

#### Local IPSec X.509 Key

In this window, you can define local keys for **X.509** certificates provided you have already generated these certificates in the **IPSec VPN/CA Management** menu. Chapter 4.7.6 on page 241 describes the process of generating X.509 certificates.

**Local Certificate**: Select here the certificate for the **X.509** authentication This menu only contains those certificates for which the associated **private key** is available.

**Passphrase**: In the entry field, enter the password used to secure the private key.

The **Active Key** will appear with its name in the **Local IPSec X.509 Key** window. If you choose a new *local key*, the old key will automatically be replaced.

Novell Security Manager will use the **ID** and **public/private key pair** of the current *Local X.509 Key* to identify, authenticate, and encrypt *X.509 IPSec key exchanges*.

#### RSA Authentication

For the authentication via **RSA** each side of the connection requires a key pair consisting of a **Public Key** and a **Private Key**. The key pair is created in two steps in the **Local IPSec RSA Key** window: First, the **Local IPSec Identifier** is defined and then the *key pair* generated.

1. In the **Local IPSec RSA Key** window, define a unique **VPN Identifier**.

   **IPv4 Address**: For static IP addresses.

   **Hostname**: For VPN security gateways with dynamic addresses.

   **E-Mail Address**: For mobile (road warrior) connections.

   Save the settings by clicking **Save**.

2. Generate a new **RSA Key**, by selecting the key length from the **RSA Key Length** drop-down menu.

**Important Note:**

The **key length** must be identical on both Security Managers. Depending on the selected key length and the processor of the security solution, the generation of **RSA keys** can take several minutes.

3. When you click **Save**, the system will begin generating a new RSA key pair.

Then the active **Public Key** will be displayed in the **Local Public RSA Key** window. The *Public Key* from this window will be exchanged with the respective end point, e.g. via e-mail.

The **Public Key** from the endpoint will be entered later into the **Remote Keys** menu in the **Public Key** window. The **Remote Keys** menu is described in chapter 4.7.4 on page 237.

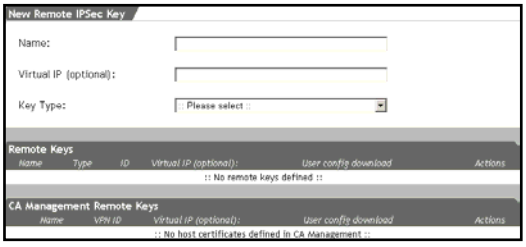
#### PSK Authentication

For authentication through **Preshared Keys (PSK)**, in this menu no additional configuration for the **local IPSec key** is required!

During the *key exchange* using **IKE Main Mode**, only **IPv4 Addresses** are supported as IPSec identifiers. The *IPSec identifier* in the *IKE Main Mode* is automatically encrypted with the **PSK**, and so **PSK** cannot be used for authentication. The IP addresses of IKE connections are automatically used as **IPSec identifiers**.

You generate the **PSK Key** in the **IPSec VPN/Remote Keys** menu. It will automatically be used as the **Local PSK Key** as well.

### 4.7.4. Remote Keys




IPSec remote key objects can be administered in the **Remote Keys** menu. An IPSec-Remote-Key-Object represents an IPSec receiver. This receiver can either be a **Security gateway**, a **Host** or also a **Road warrior** with *dynamic IP-address*.

An IPSec remote key object is defined by three parameters:

- The IKE authentication method (PSK/RSA/X.509)
- The IPSec ID of the remote endpoint (IP/Hostname/E-Mail Address/Certificate)
- The authentication data (Shared secret for PSK, public key for RSA, X.509 certificate)

#### User Config Download

The **User Config Download** function facilitates the configuration of the client applications for X.509-based IPSec VPN road warrior connections. The function is contained in the **CA Management Remote Keys** table and will be activated, when the corresponding user certificate is selected for a road warrior connection in the **IPSec VPN/Connections** menu.

The security system saves the profile of the X.509-based road warrior connection to an INI-file. Clicking on the download icon (  ) allows you to download this INI-file and to import it to an IPSec client application with corresponding *Profile Import* function (e. g. **Astaro Secure Client V8.2**).
As a fallback position, the *User Config* file contains standard algorithms, if an encryption or authentication algorithm has been configured for an IPSec VPN connection, which is not supported by the IPSec client application.

Please remember that you need for the configuration of the *road warrior client* also the **PKCS#12** container file with certificates. The container file is generated in the **IPSec VPN/CA Management** menu and can be downloaded from there. The **CA Management** menu is described in detail in chapter 4.7.6 on page **Error! Bookmark not defined.**.

The way to set-up the **Astaro Secure Client V8.2** is described in the associated *user manual* or *configuration guide*. The manuals and guides are available at **http://www.astaro.com/kb**.

#### New Remote IPSec Key

Every IPSec remote endpoint must have an associated IPSec remote key object defined. The new *Remote-Key* objects are defined in the **Remote IPSec Key** window.

**Defining IPSec Remote Keys**:

1. Under the **IPSec VPN** tab, open the **Remote Keys** menu.

   The **New Remote IPSec Key** will be displayed.

2. In the **Name** field, enter a name for the new **Remote Key**.

   If you wish to use the *IPSec Remote Key* for a standard connection, continue with step 3.

   **Virtual IP (optional)**: This function allows you to assign a virtual IP address to the road warrior. This is the only way to manually set IP addresses for such connections. If you enter an IP address here, it must also be configured on the road warrior system.

   **Attention:**

   With a road warrior IPSec tunnel, the **Virtual IP** function must be enabled if you wish to use the **NAT Traversal** function and the L2TP Encapsulation function is disabled.
   The IP address entered here should not be used anywhere else, and cannot be a part of a directly connected network.

3. Use the **Key type** drop-down menu to select the IKE authentication method. Further options are available depending on the chosen **Key type**.

   **PSK**: The firewall only supports using **IPv4 Addresses** as **VPN Identifiers** during the key exchange phase of **IKE Main Mode**. Enter the shared password in the **Preshared Key** field.
   If you wish to configure many road warrior connections, you only need one PSK for all connections.

   **Security Note:**

   Use a secure password! Your name spelled backwards is, for example, not a secure password – while something like xfT35$4 would be. Make certain that this password does not fall into the wrong hands. With this password, an attacker can build a VPN connection to the internal network. We recommend changing this password at regular intervals.

   **RSA**: The key pair consists of a **private key** and a **public key**. In order for the endpoints to communicate, they must exchange their **public keys**. **Public keys** can be exchanged via e-mail.

   In the **VPN Identifier** drop-down menu, choose the VPN ID type of the endpoint. If you select **E-Mail Address**, **Full qualified domain**

**name** or **IP Address**, you must enter the address or name in the entry field below.

**X509**: Use the **VPN Identifier** drop-down menu to select the kind of VPN ID to use. If you select **E-Mail Address**, **Full qualified domain name** or **IP Address**, you must enter the address or name in the entry field below.
In order to use a **Distinguished Name** as an ID, you will need the following information from the X.509 index: Country (C), State (ST), Local (L), Organization (O), Unit (UO), Common Name (CN) and E-Mail Address (E-Mail).

**4.** To save the new IPSec remote key object, click **Add**.

The new remote key object will appear in the **Remote Keys** table.

**CA Management Remote Keys** are shown in a separate table.

#### ASC Client Parameters

This window allows you to define Name (DNS) and WINS servers and a client domain, which should be assigned to clients when the connection is established.

### 4.7.5. L2TP over IPSec

**L2TP over IPSec** is a combination of the *Layer 2 Tunneling Protocol* and of the *IPSec* standard protocol. **L2TP over IPSec** allows you, while providing the same functions as PPTP, to give individual hosts access to your network through an encrypted IPSec tunnel. On Microsoft Windows systems, **L2TP over IPSec** is easy to set-up, and requires no special client software.

For the MS-Windows systems 98, ME and NT Workstation 4.0, **Microsoft L2TP/IPSec VPN Client** must first be installed. This client is available from Microsoft at:

http://www.microsoft.com/windows2000/server/evaluation/news/bulletins/l2tpclient.asp

#### L2TP over IPSec Settings


**Authentication**: Use this drop-down menu to configure the authentication method. If you have defined a RADIUS server in the **System/User Authentication** menu, you can use it here as well.
The configuration of the Microsoft IAS RADIUS server and the configuration of RADIUS within WebAdmin is described in chapter 4.1.7 on page 52.

**Debugging**: This function allows you to check the L2TP-over-IPSec connection. Detailed information is logged to the IPSec logs. These protocols can be displayed in real time in the **Local Logs/Browse** menu or downloaded to your local computer. Further information about the **Local Logs** menu can be found in chapter 4.9 on page 254.

#### L2TP over IPSec IP Pool


This menu is used to define which IP addresses PPTP hosts should be assigned to. By default, a network from the private IP range 10.x.x.x will be selected when the L2TP-over-IPSec function is enabled for the first time. This network is referred to as **IPSec Pool** and can also be used for all other functions of Novell Security Manager, using network definitions. If you wish to use a different network, simply change the definition of the *IPSec-Pool*, or assign another defined network as *IPSec-Pool* here.

**Note:**

If you use private IP addresses for your **IPSec Pool**, such as the predefined network and you wish IPSec hosts to be allowed to access the Internet, appropriate **Masquerading** or **NAT** rules must be in place for the *IPSec Pool*.

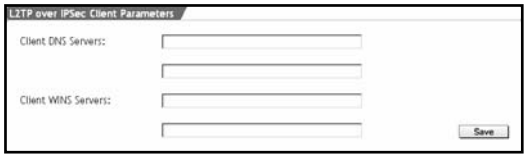
#### DHCP Settings

This window will be displayed if you have selected the **DHCP** setting in the **L2TP over IPSec Settings** window under the **IP Address Assignment** function.

**Interface**: Define the network card, across which the DHCP-server is connected. Note that the DHCP does not have to be directly connected to the interface - it can also be accessed through a router.

**DHCP Server**: Select the DHCP-server here. This drop-down-menu displays all hosts, which had been defined in the **Definitions/ Networks** menu.

#### L2TP over IPSec Client Parameters




This window allows you to define DNS and WINS servers which should be asigned to hosts when the connection is established.

### 4.7.6. CA Management

A **Certificate Authority (CA)** certifies the authenticity of public keys. This ensures that the certificate used in a VPN connection really belongs to the endpoint, and not to an attacker. The **CA Management** menu allows you to create and manage your own **X.509 Certificate Authority (CA)**. The authority will verify the validity of X.509 certificates exchanged during IPSec VPN connections. The relevant information is stored in the X.509 certficates.

But you can also use certificates, signed by commercial providers, such as VeriSign.

---

**Note:**

Every certificate has unique **CA** with respect to its identifying information (Name, Firm, Location, etc.). If the first certificate is lost, a second cannot be generated to replace it.

---

The **CA Management** menu allows you to manage three distinct kinds of certificates, which are used for different purposes. The three certificates differentiate themselves according to use, and, importantly, whether or not the **Private Key** is stored:

**CA (Certificate Authority) Certificate**: If a **CA** is saved without **private key**, it can be used for the authentication of the host and user certificate of incoming IPSec connections: this type of CA is called a **Verification CA**.

If a **CA** saves its **private key**, it can be used to sign certificate queries, in order to produce a valid certificate. This **CA** is called a **Signing CA**.

The system can contain a number of **Verification CAs**, but only one **Signing CA**.

**Host CSR (Certificate Signing Request)**: This is a request to have a certain certificate signed. When it is given to a **Signing CA** - and the CA verifies the identity of the owner – the CA sends back a fully-formed and signed **Host Certificate**.

**Host Certificate**: This certificate contains the **public key** of the host as well as identifying information about the host (such as IP address or owner). The certificate is also signed by a **CA**, verifying that the **key** does indeed belong to the entity named in the identification information. These valid certificates are used to authenticate remote IPSec hosts/user endpoints.


The drop-down menu at the bottom of the table allows you to download certificates in various formats, or to delete certificates from the system:

**PEM**: A format encoding the certificate in ASCII code. The certificate, request, and private key are stored in separate files.

**DER**: A binary format for encoding certificates. The certificate, request, and private key are stored in separate files.

**PKCS#12**: A "container file". One file can contain the certificate, private key, and verification CA.

**Delete**: Delete the specified certificate.

**Issue CERT from CSR**: This function signs a **CSR**, generating a full host certificate.

**Generating a Client/Host Certificate**:

**Step 1**: Create a **Signing CA**.

1. Under the **IPSec VPN** tab, open the **CA Management** menu.
2. In the **Certificate Authorities** table, click the **New** button.

   The **Add Certificate Authority** window will open.
3. Select the **Generate** option.
4. In the **Name** field, enter a descriptive **Name** for the certificate authority.

   Allowed characters are: Only alphanumeric and underscore characters are allowed.

5. Enter a password with at least four characters in the **Passphrase** field.
6. Use the **Key Size** drop-down menu to select the desired key length.
7. Use the drop-down menus and entry fields from **Country** to **E-Mail Address** to enter identifying on the **CA**.
8. To save the entries, click the on the **Start** button.

The **Signing CA** will be loaded into the **Certificate Authorities** menu. This CA will answer **CSR** requests by generating new host certificates.

**Step 2**: Generate a **Certificate Request**.

1. In the **Host CSR or Certificate** table, click the **New** button.

   The **Host CSR or Certificate** window will open.
2. Select the **Generate CSR** option.

   In the **VPN ID** drop-down menu, select the type of VPN ID to use. If you select **E-Mail Address**, **Hostname** or **IPv4 Address**, you must enter the relevant information in the field at right.
   The field should be empty if you select the **X509 DN** option.
3. In the **Name** field, enter a descriptive name for this certificate request.

   Allowed characters are: Only alphanumeric and underscore characters are allowed.
4. Enter a password with at least four characters in the **Passphrase** field.
5. Use the **Key Size** drop-down menu to select the desired key length.
6. Use the drop-down menus and entry fields from **Country** to **E-Mail Address** to enter identifying information about the **certificate holder**.

   **Common Name**: If the CSR is for a road warrior connection, enter the name of the user here. If the CSR is for a host, enter the hostname.
7. To save the entries, click the on the **Start** button.

The Certificate Request **CSR + KEY** will appear in the **Host CSRs and Certificates** table. The table will also show the type, name, and VPN IP of the CSR. The request can now be signed by the **Signing CA** created in the first step.

**Step 3**: Generate the Certificate.

1. In the **Host CSRs and Certificates** table, select the **CSR + KEY** certificate request.

2. Use the drop-down menu at the bottom of the table to select the **Issue CERT from CSR** function.

   An entry field labeled **Signing CA Passphrase** will appear. Enter the password of the **Signing CA** here.

3. Click **Start**.

From the **CSR + KEY**, the CA will generate the **CERT + KEY** certificate: the certificate will replace the CSR in the table.

**Step 4**: Download the Certificate.

1. In the **Host CSRs and Certificates**, select the new certificate.
2. Use the drop-down menu at the bottom of the table to select a download format.

   **DER**: In the **Passphrase** field, you must enter the password of the **Private Key**.

   **PEM**: No password is necessary.

   **PKCS#12**: Enter the password of the **Private Key** in the **Passphrase** field. In the **Export Pass** field, enter a different password. This password will be required to install the certificate on the client computer.

3. Click **Start**.

You must now install the certificate on the remote computer. The installation process depends on the IPSec software on that computer.

#### 4.7.7. Advanced


This menu allows you, to make additional settings for the **IPSec VPN** option. This should, however, only be done by experienced users.

**Dead Peer Detection**: This function is used to automatically determine whether a remote IPSec peer can still be reached. For connections with static end points the tunnel is automatically negotiated after a failure. For connections with dynamic endpoints, the receiver is required to re-initate the tunnel again. In general this function is safe to operate and can be kept enabled, regardless of whether your IPSec peers support Dead Peer Detection or not - the feature will be automatically negotiated.

**NAT Traversal**: When enabled, **NAT Traversal** allows hosts to establish an IPSec tunnel through NAT devices. This function attempts to detect if NAT firewalls are being used between the server and client: if so, the

system will use UDP packets to communicate with the remote host. Please note that both IPSec nodes must support NAT traversal, and that road warrior nodes must be configured with a virtual IP address.
In addition, IPSec passthrough must be turned off on the NAT device(s), as this can break NAT traversal.

**Important Note:**

You cannot use local IP addresses for the **Virtual IP** address, because Novell Security Manager does not answer ARP requests for these.

**Copy TOS Flag**: **Type-of-Service**-Bits (**TOS**) are several four Bit-flags in the IP-header. The Bits are referred to as *Type-of-Service*-Bits, as they allow the transferring application, to tell the network which type of service quality is necessary. The available service quality classes are: minimum delay, maximum throughput, maximum reliability and minimum cost.
This function copies the content of the **Type-of-Service** field in the encrypted data packet, so that the IPSec data traffic can be routed according to its priority.
Enable the **Copy TOS Flag** function by clicking on the **Enable** button.

**Send ICMP Messages**: If a data packet overwrites the configured **MTU** value, the system will send an ICMP message to the source address: Destination unreachable/fragmentation needed.
This allows for using Path MTU Discovery.

**Automatic CRL Fetching**: There might be situations, in which the provider of a certificate attempts to revoke the confirmation awarded with still valid certificates, for example if it has become known that the receiver of the certificate fraudulently obtained it by using wrong data (name, etc.) or because an attacker has got hold of the private key, which is part of the certified public key. For this purpose, so-called *Certificate Revocation Lists* or **CRL**s are used. They normally contain the serial numbers of those certificates of a certifying instance, that have been held invalid and that are still valid according to their respective periods of validity.
After the expiration of this periods the certificate will no longer be valid and must therefore not be maintained in the block list.

The **Automatic CRL Fetching** function automatically requests the *CRL* through the URL defined in the partner certificate via HTTP, Anonymous FTP or LDAP Version 3. On request, the *CRL* can be downloaded, saved and updated, once the validity period has expired. Enable the function by clicking on the **Enable** button (status light is green).

Please, check if the packet filter rules in the **Packet Filter/Rules** menu are configured such that the **CRL Distribution Server** can be accessed.

**Strict CRL Policy**: Any partner certificate without a corresponding *CRL* will be rejected.
Enable the function by clicking on the **Enable** button (status light is green).

**Send ICMP Messages**: If a data packet exceeds a set **MTU** value, the system will send the following ICMP message to the source address: Destination unreachable/fragmentation needed.
This allows for the use of Path MTU Discovery.

**IKE debug Flags**: This selection field allows you to configure the scope of IKE-debugging logs. The IKE Debugging function must be enabled in the **IPSec VPN/Connections** menu.

The following flags can be logged:

- State Control: control messages on the IKE status
- Encryption: encryption and decryption operations
- Outgoing IKE: content of outgoing IKE messages
- Incoming IKE: content of incoming IKE messages
- Raw Packets: message in unprocessed bytes

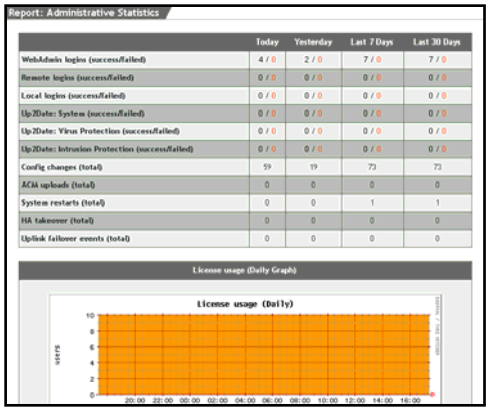
**MTU**: Enter a the MTU value in this entry field.
By default the MTU value is already defined: 1420 Byte.

## 4.8. System Management (Reporting)

The **Reporting** function provides current information about the system, the state of various subsystems, and real-time information about various reporting functions. The displayed values are updated every five minutes.

The diagrams shown on the first page of the **Reporting** menus show an overview of the current day's activity. By clicking the **Show all ...** button you can open a page containing graphics built from weekly, monthly, and yearly statistics.

### 4.8.1. Administration

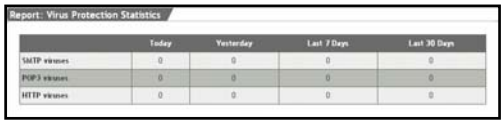



The **Administration** menu contains an overview of the administrative events of the last 30 days.

The following events will be displayed:

- WebAdmin Logins
- Remote Logins
- Local Logins
- System Up2Dates
- Virus Pattern Up2Dates
- Intrusion Protection Pattern Up2Dates
- Config Changes
- Configuration Manager Uploads
- System Restarts
- High Availability Takeover

### 4.8.2. Virus

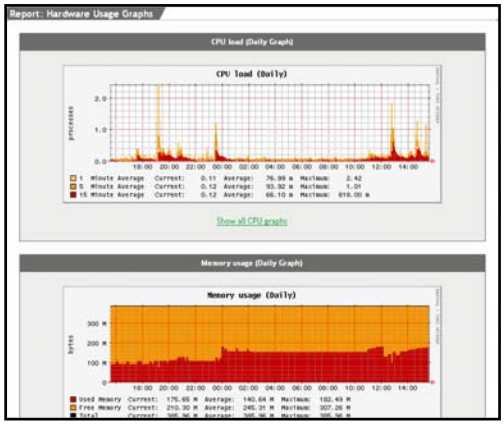



The **Virus** menu contains an overview of the filtered viruses of the last 7 days.

The following viruses will be displayed:

- SMTP viruses
- POP3 viruses
- HTTP viruses

### 4.8.3. Hardware




This menu shows the current values relating to your system hardware. The system collects statistics about CPU utilization, RAM utilization, and swap utilization.

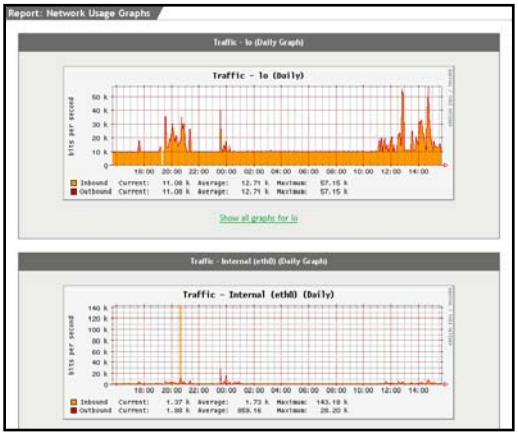
Novell Security Manager collects graphics and statistics every five minutes and updates them. The information can also be updated manually by clicking on the **Reload** button. Don't use the **Refresh** button of the browser, because this will log you out of the **WebAdmin** configuration tool!

**CPU Load (Daily Graph)**: This diagram shows the current utilization of the CPU.

**Memory Usage (Daily Graph)**: The current RAM utilization statistics are shown here. When more functions and subsystems are enabled on the firewall, more RAM will be required to support them.

**SWAP Usage (Daily Graph)**: This diagram shows the current amount of swap space being used. Swap space is used to supplement **RAM**: if your system is running out of available RAM, you will see a sharp increase in swap usage.

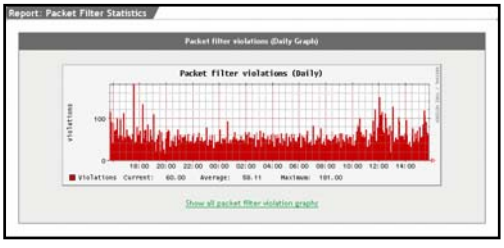
### 4.8.4. Network




This menu shows current statistics relating to network traffic. These diagrams will not be useful unless the network cards have been correctly configured in the **Network/Interfaces** menu.

The configuration process for network cards is described in chapter 4.3.2 on page 93.

### 4.8.5. Packet Filter




Packet filter violations in diagrams will be displayed in a graphic in this menu. The rule violations will also be logged to the **Packet Filter Logs**. The log files are saved to the **Local Logs/Browse** menu.

### 4.8.6. Content Filter

The processed data and actions of the **Content Filter**, relating to the HTTP, SMTP and POP3 proxies will be displayed in the form of tables and diagrams in this menu. The **Spam Protection** option and the **Spam Score** are described in chapter 4.6.2.2 on page 199.

Information on the SMTP and POP3 proxies:

- Sum of the treated messages
- The average size of messages in kilobytes
- The average height of *Spam Score*

Information on the HTTP proxy:

- Sum of requested HTTP sites
- Sum of the HTTP sites, blocked by *Surf Protection*
- Sum of the HTTP sites, blocked by *Virus Protection for Web*
- Sum of the HTTP sites, blocked by *Spyware Protection*

### 4.8.7. PPTP/IPSec VPN

The PPTP and IPSec-VPN connections will be displayed in a graphic in this menu.

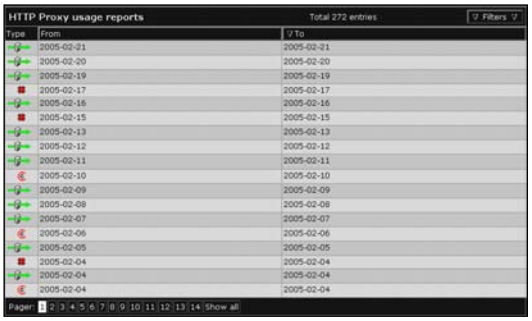
### 4.8.8. Intrusion Protection

Intrusion Protection events will be displayed in a graphic in this menu.

### 4.8.9. DNS

The DNS-Query-statistic is represented in this menu.

### 4.8.10. HTTP Proxy Usage




The access to the **HTTP proxy** is recorded in this menu.
If you have user authentication enabled in the **HTTP proxy**, the reports will map usage data to user names.

There are three types of reports:

- **Allowed Pages** ( ): This report contains the pages delivered to the clients.
- **Blocked Pages** ( ): This report contains the pages blocked by the *content filter*.

**Blocked Categories** ( ): This report contains the pages blocked by the *surf protection categories*.

### 4.8.11. Executive Report

In the **Executive Report** menu, a complete report is created from the individual reports in the **Reporting** tab.

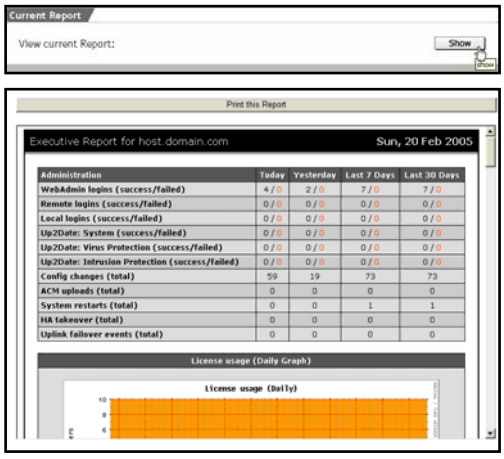
#### Daily Executive Report by E-Mail


Once a day an updated complete report is sent to the e-mail addresses entered into the **ordered list**. The function is automatically enabled, once an address has been entered into the field.

New e-mail addresses are taken over to the ordered list by the entry field, by clicking on the **Add** button.

**Ordered Lists** are described in chapter 3.3.5 on page 30.

#### Current Report




Clicking on the **Show** button opens a window, in which the current complete report is displayed. This report can be printed out by clicking on the **Print this Report** button.

### 4.8.12. Accounting


The **Accounting** function monitors all IP packets, transmitted over the various network cards and, once a day, summarizes their size. Statistics for the preceding month are also generated at the beginning of each new month. These statistics are then used to generate a report. This report is useful, for instance, when an organization pays its service provider based on the volume of data transmitted.

**Accounting** is configured and enabled in the **Network/Accounting** menu. Further information is available in chapter 4.3.8 on page 138.

**Browse Accounting Reports**: The existing accounting protocols will be displayed in this window. Select the month from the **Select Report** drop-down menu. The report will appear in the window below.

Use the **Local Logs/Browse** menu to download or delete reports.

**Report for current Month**: This window displays the accounting report for the current month.

**Configuring Accounting**:

1. Under the **Reporting** tab, select the **Accounting** menu.
2. Enable the **Accounting Reports** subsystem by clicking the **Enable** button.

   The entry window will open.
3. Use the selection field in the **Queried networks** window to select the networks for which detailed reports should be generated. This will usually include your LAN and/or DMZ networks.

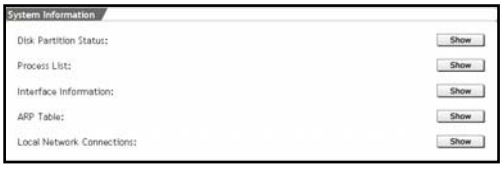
   For a description of how to use **selection field** please see chapter 3.3.2 on page 28.

**Important Note:**

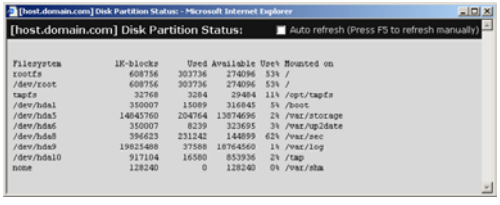
Do NOT use the "Any" network, since it will match all source and destination networks, meaning no traffic will be counted in the report!

The changes will be applied immediately, and the networks will appear in the **Queried networks** window.

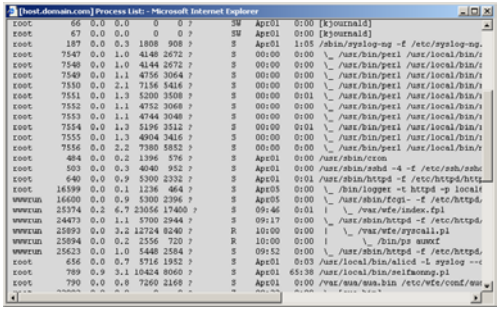
### 4.8.13. System Information



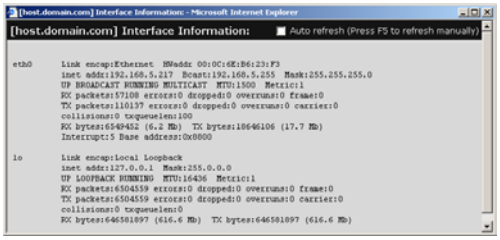

This menu offers additional system information. This information will be displayed in a separate window. Clicking on the **Show** button opens this window.




**Disk Partition**: This table lists the disk partitions on the system and their usage levels.

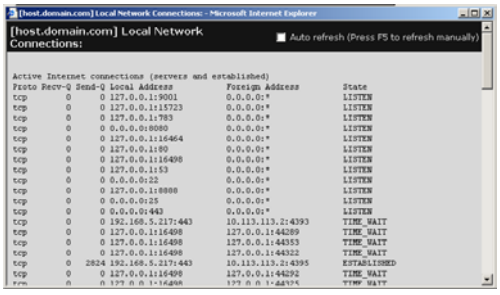



**Process list**: This tree lists all current processes on Novell Security Manager.




**Interface Information**: All configured internal and external network cards are listed here.

**ARP Table**: This table displays the current ARP cache of the system. It lists all known associations between IP addresses and hardware (MAC) addresses.

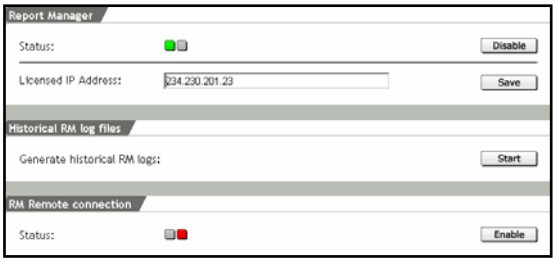



**Local Network Connections**: This table lists all current network connections to the firewall. Connections through the firewall are not shown.

## 4.9. Remote Management (Remote Management)

The **Remote Management** tab contains the interfaces to further programs and tools, which allow you to remotely administer Novell Security Manager and the private networks.

### 4.9.1. Report Manager (RM)




The **Report Manager** collects and evaluates the log files generated on Novell Security Manager. Since data are compiled centrally on the *Report Manager*, among others also the data from security solutions of other producers, the administrator can compare and analyze the messages because they are clearly laid out, and he can thus introduce the associated blocking measures against attacks fastly. The *Report Manager* is a distinct product that must be acquired separately.

In the **RM** menu, you enable the interface to the **Report Manager (RM)** and make the settings for the generation of local log files: Next to the settings for the transfer of the **RM Log Files** to the *Report Manager* you can also generate the **RM Log Files** for the historic log file archive and download them to a local computer.
This chapter describes the functions and settings contained in the **RM** menu. Depending on the existing network topology and the adjusted *Report Manager* Network architecture, some settings must be made for the integration of the Remote Management Tool.

Possible *Report Manager* Network architectures are:

- Local RM Architecture
- Centralized RM Architecture
- Large-Scale RM Architecture

The layout and the installation of those RM Network Architectures are described in the **RM/NSMA5-Integration Guide**.

The installation of the software and the required settings to connect the **Report Manager** to the **Novell Security Manager powered by Astaro** are described in **RM/NSMA5-Integration Guide**.
The way to use the **Report Manager** is described in the associated manuals. The guides and manuals are available at **http://www.novell.com/documentation/nsma51**.

#### Report Manager (RM)

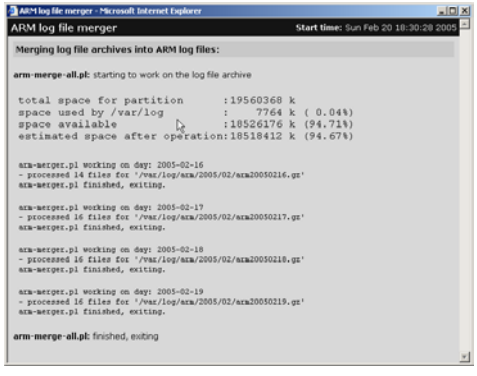
**Status**: Clicking on the **Enable** button enables the interface to the **Report Manager** and the functions to generate **RM Log Files** (status light green).

**Licensed IP Address**: This entry field will be displayed once you have enabled the function in the **Status** line.
The scope of the license of the *Report Manager* depends on the amount of connected Security Managers. Those Security Managers are identified by means of your IP address. Enter the IP address of the network card through which the log files are sent to the RM Syslog Server into the entry field. Once you have entered a valid IP address the *RM Log Files* are generated automatically during the *Log File Rotation* process the next night. Those log files can then be downloaded manually to a local computer or sent automatically to a host via the functions of the other windows. Here, there are no Live Logs for RM log files.

#### Historical RM Log Files


With this function Novell Security Manager generates special *Historical Log Files*, which can be imported and evaluated by the *Report Manager*.

**Generate Historical RM Logs**: By clicking on the **Start** button all daily log files from the archive are comprised in one *Historical-Log-File*.




The generation process is displayed in the **ARM Log File Merger** window. This process is successful if only the **arm-merge-all.pl: finished, exiting** message is displayed in this window. If the process finished unsuccessfully, the reason for the interruption is displayed next to the message, such as **not enough free space available, exiting**, if there was not enough memory on the hard disk.

**Download Historical RM Logs**: This function is available as soon as the first *Historical-Log-File* has been generated. Clicking on the **Start** button opens a dialogue by which the *RM Log File* (file: **arm_logs.tar**) can be downloaded to a local computer.

#### RM Remote Connection

This window allows you to configure the **RM Log Files Transfer**. The new settings do not influence existing log files.

**Status**: Click the **Enable** button to enable the function (status light shows green).

An advanced entry window will open.

**Security Note:**

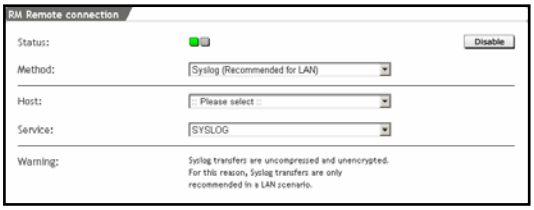
Both data transfer methods are unencrypted. If the log files are sent to a server outside the private network this should be done through a Host-to-Net IPSec VPN tunnel. An existing Net-to-Net connection can not be used!

**Method**: For the data transfer the methods **Syslog** and **SMB/CIFS Share** are available. For both methods you must first define an RM server on Novell Security Manager to which the *RM Log Files* are sent. The server and/or the host are added in the **Definitions/Networks** menu. Then you can make the following settings:

- The **Syslog** method is recommended for a LAN-network architecture. Once you have selected this method you make the following settings.

  **Host**: From the drop-down menu select the RM server to which the RM Log Files shall be sent.

  **Service**: Select the service from the drop-down menu that shall be used for the data transfer.




  Do not confuse those settings with the **System/ Remote Syslog** menu: There, usually only one *Syslog Server* can be defined for Novell Security Manager. In the **RM** menu, the *Report Manager (RM)* can be configured independent from that as Syslog-Server. The data are transferred in a special RM-compatible format so that the *Report Manager* works correctly.

- The **SMB/CIFS Share** method is recommended for a WAN-network architecture. Once you have selected this method you make the following settings.

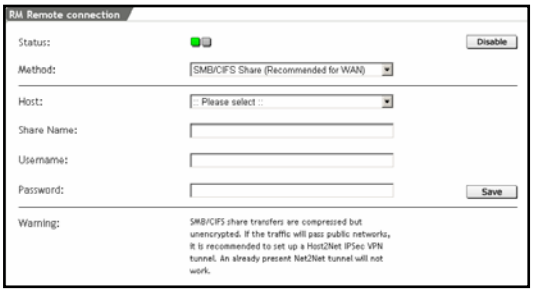
  **Host**: From the drop-down menu select the RM server to which the RM Log Files shall be sent.

  **Share Name**: Enter the Windows Share Name in the entry field. Ensure that the associated rights for the tab have been defined in the *Report Manager*.

**Username**: Enter the user name to use for the SMB Account.

**Password**: Enter the password for the SMB Account.

Save the settings by clicking **Save**.




During a transfer with the *SMB/CIFS Share* method the RM Log Files are transferred as a Gzip ASCII-file. Those log files are in a tab that is sub-divided according to year and month (**example**: `arm\2004\10\20041017.gz`).

The *RM log files* are generated once the interface to the *Report Manager* is enabled and a valid IP address has been entered in the **Licensed IP Address** entry field. After the configuration of the **RM Remote Connection** the *RM log files* are sent to the associated server.

## 4.10. Local Logs (Log Files)

The logs, generated by the system will be managed in the **Local Logs** tab.

### 4.10.1. Settings


Configure the basic settings for the creation of log files in the **Settings** menu.

**Status**: Click the **Enable** button to enable the function (status light shows green).

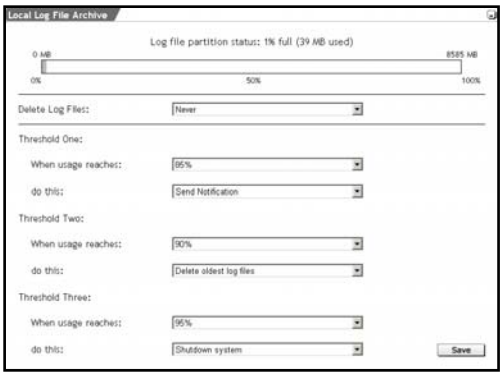
**Important Note:**

When this function is disabled, Novell Security Manager will not create **Log Files**!

**Local Log File Archives**: This function locally stores generated log files to Novell Security Manager. Configure the settings for the local log file archive in the **Local Log File Archive** window.
By default, this function is enabled automatically, once the logging functions are enabled.

**Remote Log File Archives**: This function allows you, to save the generated log files to a remote host or server. The settings for the automating of the log file archive on a separate server are configured in the **Remote Log File Archive**.

### Local Log File Archive




This window allows you to observe the utilization of the local log file partition. The diagram first displays the used disk space in MB as well as the utilization of the partition in percent.

In the lower window, select from the drop-down menu, how the system has to react if a specific part of the partition is overloaded with log files. Three levels with different actions can be selected here.

**Delete Log Files (span of time)**: In this drop-down menu select the length of time, in days, after which the log files will automatically be deleted by the Security Manager.

**Configuring the Log Files Level**:

For each level, the following settings can be configured:

**When Usage reaches**: Configure here, at which utilization in percent of the system partition an action will be executed.

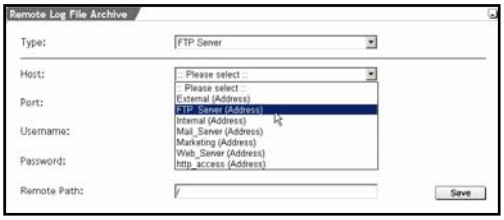
**do this**: Configure the action in this selection menu.

The following actions can be configured:

- **Delete oldest Log Files**: The oldest log files will automatically be deleted by the Security Manager. The administrator previously receives the WARN 711 notification e-mail.
- **Send Notification**: Only the INFO 710 notification e-mail with the correspondent warning will be sent to the administrator.
- **Shut down System**: The Security Manager will automatically shutdown. The administrator receives the CRIT 712 notification e-mail before.
- **Nothing**: No actions will be started.

Save the settings by clicking on the **Save** button.

### Remote Log File Archive




In this window configure the settings for a remote log files archive. If the *Remote Log File Archive* is on a server, you must first add it to the **Definitions/ Networks** menu.

**Configuring Remote Log File Archive**:

1. In the **Global Settings** window, enable the **Remote Log File Archives** function by clicking on the **Enable** button.

   The **Remote Log File Archive** window will open.

2. Use the **Type** drop-down menu to select the archiving type.

   The drop-down menus and/or entry fields for the selected archiving type will be displayed.

3. Configure the settings for the archiving type.

   ### 3.1 FTP Server

   **Host**: Use the drop-down menu to select a host.

   **Port**: Use the drop-down menu to select a port.
   By default, FTP is already selected.

   **Username**: Enter a username in the entry field.

   **Password**: Enter the password in this entry field.

   **Remote Path**: Enter the path in the entry field.

   ### 3.2 SMB (CIFS) Share

   **Host**: Use the drop-down menu to select a host.

   **Username**: Enter a username in the entry field.

   **Password**: Enter the password in this entry field.

   **Share Name**: Enter the share name in the entry field.

   ### 3.3 Secure Copy (SSH) Server

   **Public DSA Key**: The Public DSA Key is displayed in this window.

   **Host**: Use the drop-down menu to select a host.

   **Username**: Enter a username in the entry field.

   **Remote Path**: Enter the absolute path in the entry field.

   ### 3.4 Send by E-Mail

   **E-Mail Address**: Enter the e-mail address into this entry field.

4. Save your changes by clicking **Save**.

### 4.10.2. Local Log File Query


The **Local Log File Query** action allows you, to search for specific **Log Files** in a local archive. The search result will be displayed in a separate window.

**Starting searches**:

1. In the **Time Span** drop-down menu select the time span.
2. In the selection field **Logs**, choose the protocols.

   For a description of how to use the **selection field** please see chapter 3.3.2 on page 28.
3. In the **Mode** drop-down menu, select the mode.
4. If you are looking for protocols with specific strings, enter the strings into the **Search Term** entry field.
5. Begin the search by clicking **Start**.

The protocols will be listed in a separate window.

### 4.10.3. Browse

Each protocol is contained in the **Browse** menu. If this menu is opened, the protocol groups (logs) will be displayed in the **Browse Local Log Files** overview.

#### The Log File Overview

All protocol groups (logs) are contained in this overview. The groups with the current protocols can directly be opened from this overview.


The functions from the left to the right:

**Selection box**: This setting is required in connection with the drop-down menu at the footer of the table. Select the protocol groups and then choose the action (**Delete** or **Download as ZIP File**) from the drop-down menu. The action will start immediately.
Clicking on the selection box in the header selects all protocol groups.

(): Clicking on the trash can icon deletes a group from the table.

**Name**: All protocols are listed in alphabetical order in this column.

**Date**: The date of current protocols will not be displayed.

(): Clicking on the folder icon opens the sub-tab with all protocols of this group.
By clicking again on the icon, you will get back to the overview. The additional functions in the sub-tab are described in the „Log File Sub-tab" section.

**File Count/Name**: The number of existing files will be displayed in this column. The old protocols can be opened from the sub-tab.

**Activity**: If the protocols in a group have been logged since Midnight, a correspondent message will be displayed:

- **Now**: The protocols are being generated right now.
- **Today**: Protocols have been generated since Midnight.

Open the current protocol (**Live Log**) by clicking on the message **Now** or **Today**.

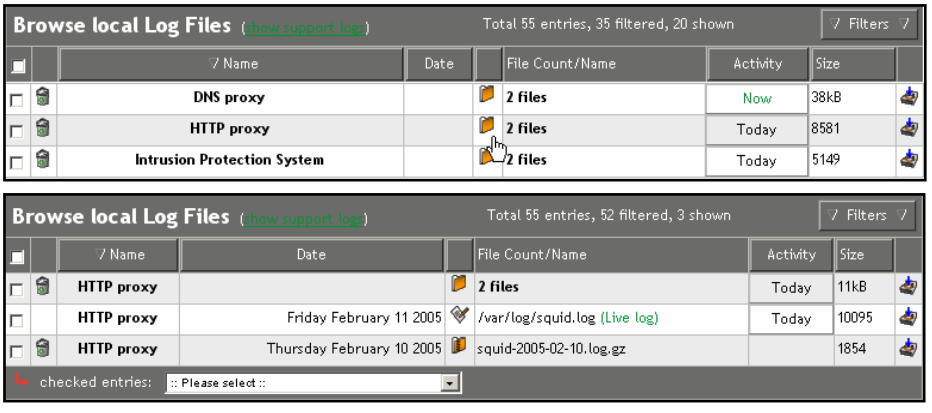
**Size**: The size of the log file group will be displayed in this column.

(): Clicking the download icon will allow you to download this **Log File** to your local client computer. You can then use these **Log Files** to import data into another program, for example Microsoft Excel.

#### The Log File Sub-Tab

All protocols (Logs) of a group are listed in this sub-tab. The sub-group can be opened in the overview by clicking on the folder icon ().

The following additional functions are available in the sub-tab:




**Date**: For older protocols, listed in the sub-tab the date and time will be displayed.

(): Return to the overview by clicking on the folder icon.
(): This is today's protocol. Clicking on the icon opens the **Live Log** window.

(): This in an archived protocol. Clicking on the symbol opens the **Log** window.

**File Count/Name**: In the protocol from today, the path to the log file and the **Live Log** message will be displayed in this column.
In this column, the file names will be displayed next to the archived log files.

#### Filters

The **Filters** function allows you to filter *Log Files* with specific attributes from the table. This function enhances the management of huge networks, as log files of a specific type can be presented in a concise form.

**Filtering Log files**:

1. Click on the **Filters** button.

   The entry window will open.

2. Enter the filter attributes in the fields. Not all attributes have to be defined.

   **Group**: If you wish to filter the log files of a specific group, select it from the drop-down menu.

   **Month**: This drop-down menu allows you to filter log files by a given month.

   **Type**: This drop-down menu allows you to filter log files by a specific type.

3. To start the filter click on the **Apply Filters** button.

Only the filtered log files will be displayed in the table. Next time when you open the menu, the complete log file table will be displayed.

#### 4.10.3.1. Log Files

This chapter contains all available logs. These log files will only be displayed in the **Browse** menu, if the correspondent processes have been recorded by the System. The following **Accounting data** log file, for example, will only be displayed, once the **Accounting** function has been enabled in the **Network/Accounting** menu.

**Accounting data**: These log files contain all **Accounting** logs, archived by the system. The **Reporting/Accounting** menu allows you to view the current logs.

**Admin notifications**: The *Notification Log Files* record all notification e-mails sent by the firewall. This allows an administrator to monitor critical system messages even if the e-mail system is down.

Error, warning, and information codes are listed in chapter 4.10.3.2 on page 267.

**Boot messages**: The boot messages are recorded to these log files.

**Configuration daemon**: The activities of the Configuration daemon are logged to these log files. The log files belong to the support logs and will only be displayed after clicking on the **show support logs** button.

**Content filter**: The activities of the content filters on the HTTP, SMTP and POP3 Proxies are logged to these log files.

**DHCP server**: If the Internet security system is used as DHCP server and assigns dynamic IP addresses to the clients in the network, the activities are recorded to these log files.

**DNS proxy**: The activities of the DNS proxy are logged to these log files.

**Fallback messages**: These log files are used as a security archive for logged processes, which cannot be assigned to one of the log files. The log files belong to the support logs and will only be displayed after clicking on the **show support logs** button. In general, those log files are empty.

**High availability**: The activities of the *High Availability (HA)* system are logged to these log files.

**HTTP accessed sites**: The requested websites are logged to these log files.

**HTTP blocked sites**: All websites blocked by the *Content Filter* are logged to these log files.

**HTTP daemon**: The log files for the HTTP daemon belong to the support logs and will only be displayed after clicking on the **show support logs** button.

**HTTP proxy**: The *HTTP proxy* logs show the activity of the HTTP proxy.

**Ident proxy**: The activities of the *Ident* proxy are logged to these log files.

**Intrusion Protection System**: The activities of the *Intrusion Protection System (IPS)* are recorded to these log files.

**IPSec VPN**: Extensive information on the configuration of the *IPSec VPN* and *L2TP over IPSec* connections is recorded to these log files. And also information on the Key Exchange and Encryption.

**Kernel messages**: The **Kernel** logs record the system status, including messages from device drivers, messages relating to the boot process, and information about blocked packets.

**License information**: The status information from the License Daemon *alicd* is logged to these log files. The log files belong to the support logs and will only be displayed after clicking on the **show support logs** button. In general, those log files are empty.

**Logging subsystem**: E.g. local filing processes to save log files to the security system, the files sent to the *Remote Log File* archive and activities with respect to sent notifications are logged to these log files.

**Local logins**: Information on the log-in processes to the local console is recorded to these log files.

**MiddleWare**: The activities of the MiddleWare are recorded to these log files. The log files belong to the support logs and will only be displayed after clicking on the **show support logs** button.

**Network accounting daemon**: The efficiency of the accounting is recorded to these log files.

**Packet filter**: Messages relating to blocked packets are shown in the *Packet Filter* logs. These log files are also included in the kernel logs.

**POP3 proxy**: The activities of the POP3 proxy are logged to these log files. All outgoing e-mails will be listed there. In addition, all irregularities, such as interruptions or blocked e-mails will be logged.

**Portscan**: The *Portscan Detection* system watches for and blocks portscans and sends e-mail messages to the administrator. When examining the **Log Files**, however, do not draw too many conclusions from the source IP addresses (SRC) and port numbers (SPT), as they can easily be falsified by the sender. The destination addresses (DST) and port numbers (DPT), however, provide useful information about what the scanner was looking for.

**PPP daemon**: These log files are generated when *Modem dialup* has been configured. The PPP daemon and *chat* program activities are logged to these log files. The *chat* program negotiates the PPP connection details.

**PPPoA**: The processes executed in the dial-up with *PPP over ATM* are recorded to these log files.

**PPPoE**: The processes executed in the dial-up with *PPP over Ethernet* are recorded to these log files.

**PPTP daemon**: These logs record the progress of PPTP sessions from external clients. This includes login and authentication information as well as error messages.

If you select the **Extensive** parameter in the **Logging** function of the **Network/PPTP VPN Access** menu, these logs will contain very detailed information about PPP connections.

**Remote Configuration Manager**: If the Internet security system is configured remotely via the *Astaro Configuration Manager*, the correspondent processes will be logged to these log files.

**Selfmonitoring**: The **Selfmonitoring** continually checks the integrity of the firewall systems and notifies the administrator of important events. Self-monitoring checks the function, performance and security of relevant system parameters and remedies deviations, exceeding given tolerances. Subsequently a report will be sent to the competent administrator by e-mail.

This **Selfmonitoring** of the security system ensures that central services such as the Syslog Daemon, HTTP Proxy, and Network Accounting are functioning properly.
Access rights to files are monitored, as is the resource usage of individual processes. This is designed to prevent an overload of the system. Moreover, the system administrator is informed in time on previsible resource bottlenecks, if, for example the available disk space is running short. This allows for an early implementation of measures in favor of a system extension and/or discharge.

**SIP proxy**: The activities of the SIP proxy are logged to these log files.

**SMTP proxy**: The activities of the SMTP proxy are recorded to these log files. All ingoing e-mails will be listed there. In addition, all irregularities, such as assigned **Bounce** conditions, interruptions or blocked e-mails will be logged.

**SOCKS proxy**: The activities of the SOCKS proxy are recorded to these log files.

**SSH daemon**: Information on the log-in processes to the remote shell is recorded to these log files.

**System log messages**: These *Log Files* record generic information about the daemon processes running on the system. Among other things, the access to the **SNMP** service and the activities of the **Dynamic DNS** function, are recorded to these log files.

**Up2Date messages**: The activities of the **Up2Date Service** are recorded to these log files. This comprises also the *System Up2Date* and *Pattern Up2Date* processes.

**Uplink Failover daemon**: The activities of the configured failovers are recorded to these log files.

**User Authentication daemon**: The activities of the AUA Daemon are logged to these log files. AUA is used as the central authentication daemon for various services.

**WebAdmin**: The use of the *WebAdmin* configuration tool is recorded to these log files. The logs contain the configuration changes, implemented by the configuration tool and also the log-in and log-out processes.

#### 4.10.3.2. Error Codes

The following is a list of all error, warning, and information codes with their meanings:

INFO:

| | |
|---|---|
| 000 | System was restarted |
| | System was restarted |
| 010 | Backup file |
| | A system backup file was generated automatically and sent via e-mail to the Administrator. |
| 105 | User Authentication deamon (UA) not running – restarted |
| 106 | Cron Task Scheduler not running – restarted |
| 107 | WebAdmin webserver not running – restarted |
| 108 | ssh server not running – restarted |
| 109 | license server not running – restarted |
| 110 | configuration database server not running – restarted |
| 111 | syslog server not running – restarted |
| 112 | middleware not running – restarted |
| 150 | Root partition mounted at / is filling up - please check |
| 151 | tmpfs partition mounted at /opt/tmpfs is filling up - please check |
| 152 | secure application partition mounted at /var/sec is filling up - please check |
| 153 | logfile partition mounted at /var/log is filling up - please check |
| 154 | storage application partition mounted at /var/storage is filling up - please check |
| 155 | Up2Date partition mounted at /var/up2date is filling up - please check |
| 300 | System Up2Date: System Up2Date started |

Further information on the Up2Date Service can be found in chapters 4.1.3 on page 40.

302 System Up2Date: No new System Up2Date packages available

303 System Up2Date succeeded: Prefetched new System Up2Date package(s)

For more Up2Date package information please see attachted Up2Date description file.
Further information on the Up2Date Service can be found in chapters 4.1.3 on page 40.

320 System Up2Date failed: License is not valid

321 System Up2Date: Started System Up2Date installlation in HA-Master-Mode

322 System Up2Date: New System Up2Dates installed

Further information on the Up2Date package(s) can be found in the notification e-mail.

323 System Up2Date: Started System Up2Date Installation

350 Pattern Up2Date: Started Pattern Up2Date

Further information on the Up2Date Service can be found in chapters 4.1.3 on page 40.

351 Pattern Up2Date: No new pattern available for Virus Protection

352 Pattern Up2Date: No new pattern available for Intrusion Protection

353 Pattern Up2Date: Trying another pattern type

354 Pattern Up2Date succeeded: Updated new Intrusion Protection patterns

For more information please see the notification e-mail. Further information on the Up2Date Service can be found in chapters 4.1.3 on page 40.

360 Virus Pattern Up2Date: No pattern installation for Virus pattern needed

361 Virus Pattern Up2Date succeeded: Installed new Virus Pattern

For more information please see the notification e-mail.

700 Daily log file archive

This is an archive file containing the log files. The date of these log files is specified in the notification.

710 Log file partition is filling up

The log file partition usage reached the specified value in percent. Depending on your configuration the system will automatically take measures if the usage continues to grow. To make sure you don't lose any important log files, please check the WebAdmin settings and/or remove old log files manually.

850 Intrusion Protection Event

A packet was identified that may be part of an intrusion. The matching rule classified this as low priority level. Further information on the Intrusion Prevention event can be found in the notification e-mail.

851 Intrusion Protection Event – Event buffering activated

A packet was identified that may be part of an intrusion. The matching rule classified this as low priority level. Event buffering has been activated. Further Intrusion Protection events will be collected and sent to you when the collection period has expired. If more events occur, this period will be increased. Further information on the Intrusion Prevention event can be found in the notification e-mail.

855 Portscan detected

A portscan was detected. The originating host was: <IP>

A portscan from the given IP address was detected. The Portscan Detection function is described in chapter 4.4.1, on page 140.

For more information:

- see WebAdmin -> Local Logs/Browse/Portscan
- search with whois to know who the source IP belongs to:

-> RIPE NCC http://www.ripe.net/perl/whois?query=$HOST

-> ARIN - http://www.arin.net/cgi-bin/whois.pl?queryinput =$HOST

-> APNIC - http://cgi.apnic.net/apnic-bin/

whois.pl?search=$HOST
- use traceroute from
-> UC Berkeley
- http://www.net.berkeley.edu/cgi-bin/traceroute? $HOST

Attention: source IP addresses can easily be forged by attackers.

856 Portscan detected - Event buffering activated

A portscan was detected. The originating host was: <IP>

A portscan from the given IP address was detected. The Portscan Detection function is described in chapter 4.4.1, on page 140.

Event buffering has been activated. Further Intrusion Protection events will be collected and sent to you when the collection period has expired. If more events occur, this period will be increased. Further information on the Intrusion Prevention event can be found in the notification e-mail.

999 File transfer request

This is the file you requested.

WARN:

005 Failed login attempt from ...(IP) at ...(time) with ...( username)

080 HA check: no link beat on interface – retrying

The link beat monitoring system on the firewall failed. The system will now try again. If the system continues to fail, the administrator will receive message WAR 081.
If you do not wish to use this monitoring function, no further action is required. After the system sends the WAR 081 message, it will not try to start the link beat monitoring system again.

081 HA check: interface does not support link beat check

The link beat monitoring system failed after multiple attempts. If you have recently installed the HA system, and you intend to use the link beat monitoring system, please check that the network cards support link beat, and that they are supported by Novell Security Manager. Also check to make sure that the link beat capable cards have been chosen for

the data transfer connection.
The installation and management of the HA system is described in chapter 4.1.10, on page 74.

158 Interface uplink usage exceeds configured limit

On a Standard-Ethernet-interface the function „Monitor Interface Usage“ was activated. The maximum value for the Uplink-Bandwidth was exceeded.

159 Interface uplink usage exceeds configured limit

On a Standard-Ethernet-interface the function „Monitor Interface Usage“ was activated. The maximum value for the Downlink-Bandwidth was exceeded.

711 Log file(s) have been deleted

The log file partition usage reached the specified value in percent. Log Files have been deleted. To make sure you don't lose more log file(s), please check the WebAdmin settings and/or remove old log files manually. The deleted files and/or directories are listed in the attachment.

715 Remote log file storage failed

The daily log file archive could not be stored on the configured remote server. Please check the WebAdmin settings for:
Local Logs/Settings/Remote log file archive
The archive file will be automatically re-transfered with the next daily log file archive.

850 Intrusion Protection Event

A packet was identified that may be part of an intrusion. The matching rule classified this as medium priority level. Further information on the Intrusion Prevention event can be found in the notification e-mail.

851 Intrusion Protection Event – Event buffering activated

A packet was identified that may be part of an intrusion. The matching rule classified this as medium priority level. Event buffering has been activated. Further Intrusion Protection events will be collected and sent to you when the collection period has expired. If more events occur, this period will be increased. Further information on the

Intrusion Prevention event can be found in the notification e-mail.

CRIT:

301 System Up2Date failed: Could not connect to Authentication Server(s)

The authentication server is not reachable. If the problem continues, please contact the support department of your firewall provider.

302 System Up2Date failed: Download of System Up2Date Packages failed

If the problem continues, please contact the support department of your firewall provider.

305 System Up2Date: Wrong MD5sum for local System Up2Date package

Please download a new Up2Date package. If the problem recurs, please contact the support department of your firewall provider.

306 System Up2Date failed: Wrong MD5sum for downloaded Up2Date Package

Please download a new Up2Date package. If the problem recurs, please contact the support department of your firewall provider.

320 System Up2Date failed: Wrong start parameters

If the problem recurs, please contact the support department of your firewall provider.

322 System Up2date stopped: Next Up2Date installation locked by HA

323 System Up2Date failed: Corrupt Up2Date Package

Found corrupt Up2Date package. Please start process again. If the problem recurs, please contact the support department of your firewall provider.

324 System Up2Date failed: Invalid License

Your license is no longer valid.

325 System Up2Date failed: License check failed

Your license could not be checked. If the problem continues, please contact the support department of your firewall provider.

333 System Up2Date failed: Internal error

The system update failed. Please contact the support department of your firewall provider.

334 System Up2Date failed: Invalid syntax

The system update failed. Please contact the support department of your firewall provider.

335 System Up2Date failed: Could not read Up2Date directory

The system update failed. Please contact the support department of your firewall provider.

336 System Up2Date failed: No installation directory

The system update failed. Please contact the support department of your firewall provider.

337 System Up2Date failed: Could not extract tar

Please start process again. If the problem recurs, please contact the support department of your firewall provider.

338 System Up2Date failed: Main Up2Date package not found

Please start process again. If the problem recurs, please contact the support department of your firewall provider.

339 System Up2Date failed: Version conflict

The system update failed. Please contact the support department of your firewall provider.

340 System Up2Date failed: Pre-Stop-Services script failed

341 System Up2Date failed: Post-Stop-Services script failed

342 System Up2Date failed: Pre-Start-Services script failed

343 System Up2Date failed: Starting Services failed

The system update failed. Please contact the support department of your firewall provider.

344 System Up2Date failed: Post-Start-Services script failed

345 System Up2Date failed: Error occured while running installer

The system update failed. Please contact the support department of your firewall provider.

346 System Up2Date failed: Installer ended due to internal error

The system update failed. Please contact the support department of your firewall provider.

347 System Up2Date failed: Started without rpm parameters

The system update failed. Please contact the support department of your firewall provider.

351 Pattern Up2Date failed: Could not select Authentication Server(s)

If the problem continues, please contact the support department of your firewall provider.

352 Pattern Up2Date failed: Could not connect to Authentication Server(s)

The authentication server is not reachable. If the problem continues, please contact the support department of your firewall provider.

353 Virus Pattern Up2Date failed: Could not connect to Up2Date Server

The Up2Date server is not reachable. If the problem continues, please contact the support department of your firewall provider.

354 Intrusion Protection Pattern Up2Date failed: Could not connect to Up2Date Server

The Up2Date server is not reachable. If the problem continues, please contact the support department of your firewall provider.

355 Virus Pattern Up2Date failed: No active bases for Virus Patterns found

356 Intrusion Protection Pattern Up2Date failed: No active bases for Intrusion Protection Patterns found

357 Virus Pattern Up2Date failed: Internal MD5Sum Error

Could not create correct MD5Sums. If the problem recurs, please contact the support department of your firewall provider.

358 Intrusion Protection Pattern Up2Date failed: Internal MD5Sum Error

Could not create correct MD5Sums. If the problem recurs, please contact the support department of your firewall provider.

360 Pattern Up2Date failed: Licence Check failed

Your license could not be checked. If the problem continues, please contact the support department of your firewall provider.

361 Pattern Up2Date failed: Restart of Virus Scanner failed

If the problem continues, please contact the support department of your firewall provider.

362 Pattern Up2Date failed: MD5Sum Error occurred

If the problem continues, please contact the support department of your firewall provider.

712 System shut down due to full log file partition

The log file partition usage reached the specified value in percent. To prevent the loss of important log files, the system has been shut down automatically. Please check the WebAdmin settings and/or remove old log files.

850 Intrusion Protection Event

A packet was identified that may be part of an intrusion. The matching rule classified this as highest priority level. Further information on the Intrusion Prevention event can be found in the notification e-mail.

851 Intrusion Protection Event – Event buffering activated

A packet was identified that may be part of an intrusion. The matching rule classified this as highest priority level. Event buffering has been activated. Further Intrusion Protection events will

be collected and sent to you when the collection period has expired. If more events occur, this period will be increased. Further information on the Intrusion Prevention event can be found in the notification e-mail.

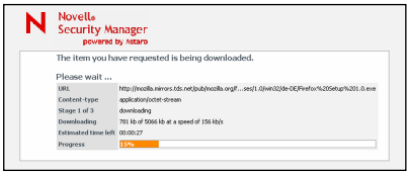
860 Intrusion Protection Event - Buffered Events

After the activation of the event buffering further IPS events have been collected. Please see the attached file for a list of collected events. This list will show you a maximum of events. A complete event history has been stored in the Intrusion Protection log files.

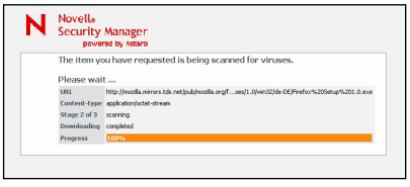
#### 4.10.3.3. HTTP Proxy Messages

The following information and error messages are returned by the HTTP proxy:

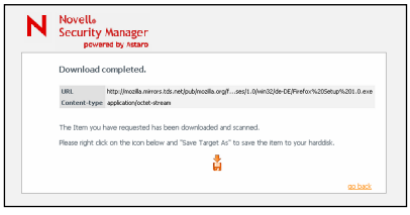
Download progress:




Step 1 of 3

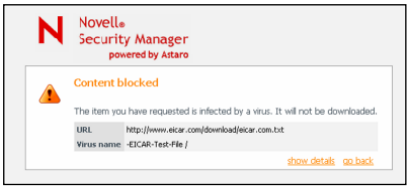



Step 2 of 3

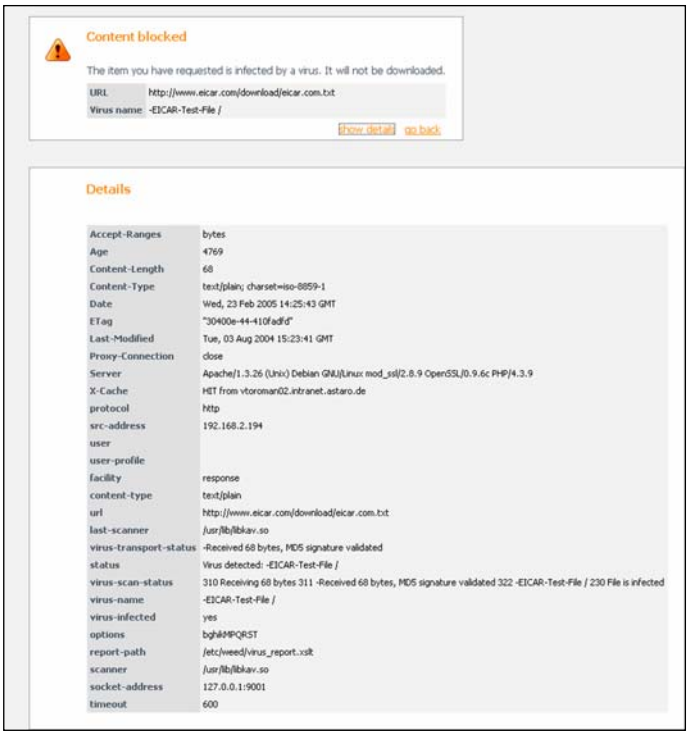



Step 3 of 3

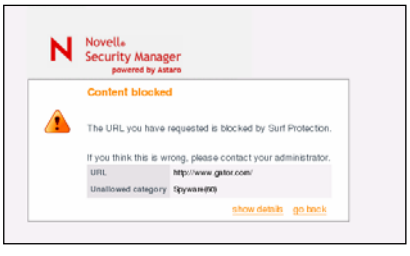
Web page blocked by *Virus Protection for Web*:



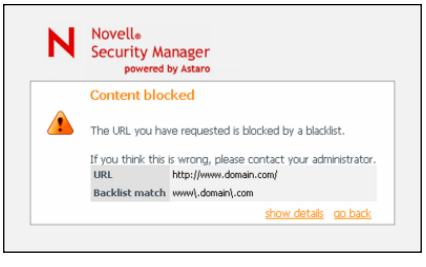
Web page blocked by *Virus Protection for Web (details)*:




Web page blocked by *Surf Protection*:




Web page blocked by a *blacklist* entry:



General error messages:


## 4.11. Online Help

The **Help** menu contains further functions for use with the **Online Help** system.

### Search

This function allows you to search **WebAdmin**'s **Online Help** system for a particular term. Results will appear in a separate window.

**Starting a search**:

1. Under the **Online Help** tab, open the **Search** menu.
2. Enter your search term in the **Search term** field.
3. Begin the search by clicking **Start**.

If the term is found in either **WebAdmin** or the **Online Help** system, the following results will be returned:

- path to the relevant function in **WebAdmin**
- link to the relevant **Online Help** page
- Information on the function or texts of the Online help with the expression, searched for

### Glossary

The glossary explains the concepts and terms used in **WebAdmin**. Click a term to see a short explanation.

## 4.12. Exiting Novell Security Manager

If you close a browser running a **WebAdmin** session without using the **Exit** function, the session will remain active until the timeout is reached.
In such a case you can again log in to **WebAdmin**. A screen will be displayed, informing you that already another user is logged in. To log in again, first end the other session by clicking the **Kick** button. If you wish to end another administrator's active session, you can type a message in the "Type reason here" field which will be transmitted to the other administrator.

# Glossary

### ARP

The **Address Resolution Protocol** (**ARP**) is used to determine the Ethernet address for a host, for which the IP address is known. To do so, the sender sends ARP broadcast and waits for that the Ethernet address is sent back again.

### Broadcast

The address used by a computer to send a message to all other computers on the network at the same time.
**Example:** A network with IP address 192.168.2.0 and network mask 255.255.255.0 would have a broadcast address of 192.168.2.255.

### Client

A client is a program that communicates over a network with a server in order to make use of a particular service.
Example: Netscape is a WWW client, and communicates with a WWW server to download web pages.

### Client-Server model

Applications based on the client-server model use a client program on the user's computer to communicate with a central server program on the network. The server is usually responsible for keeping track of the data, while the client is responsible for presenting the data to the user. In order to function correctly, the client and server must both use a well-defined network protocol to communicate. All important applications on the Internet (e.g., WWW, FTP, news) use this model.

### DNS

The Domain Name Systems (also: The Domain Name Service) translates the underlying IP addresses of Internet-connected computers into more human-friendly names or aliases and vice-versa. This translation from number to name is done by the name server. Every Internet-connected institution must employ at least two separate DNS servers to answer queries about its internal DNS names and IP numbers. Every top-level domain also has name servers which contain information about their subordinate servers.

The DNS system is thus a distributed, hierarchical database. DNS resolution is normally handled by network applications rather than by the user him or herself.

### Dual-Homed Gateway

A dual-homed gateway is a computer that is directly connected to two networks (i.e., it has two network cards, each connected to a different network) and which forwards information from one network to the other. Due to the fact that there is no IP forwarding, all connections must be forwarded through this Dual-Homed Gateway.

#### Firewall

A firewall protects one network or subnet (e.g., an internal LAN) from another network (e.g., the public Internet). All traffic between the two passes through the firewall, where it is controlled and monitored.

#### Header

In general, the header is the information contained at the top of a file or message, and consists of low-level data regarding the status and handling of the file or message. In particular, the header of an e-mail or Usenet message contains information such as the sender, recipient, and date.

#### Host

In a client-server architecture, the host is the computer which runs the server software. One host can have multiple server programs running on it: that is, an FTP server, mail server, and web server can all run on the same host. A user uses a client program, for instance a browser, to access the server on the host. The word **Server** is also often used to refer to the computer on which the server software runs, diluting the distinction between server and host in practice.

In telecommunications, the host is the computer from which information (such as FTP files, news, or WWW pages) is retrieved. On the Internet, hosts are often also called **nodes**.
Using an Internet host (as opposed to a **Localhost**), for example with Telnet, one can work from a distance (Remote Access).

#### ICMP

Next to the **IP Protocol**, there is an option with specific functions. The **Internet Control Message Protocol (ICMP)** is a special kind of **IP protocol** used to send and receive information about the network's status and other control information. Many users are already familiar with ICMP echo requests (type 8) and echo replies (type 0), as these are used by the **ping** program. When a computer receives an echo request, its IP stack sends back an echo reply: This is done with the ping program in order to determine, whether another network component is reachable.

W

#### IP

The **Internet Protocol** is the basic protocol of the Internet, and has been used without change since it was first developed in 1974. It handles the basic transmission of data from one computer to another, and serves as the basis for higher-level protocols like TCP and UDP. It handles the connection and error management. Technologies like **NAT** and **Masquerading** allow large private networks to hide behind small numbers of IP addresses (or even single addresses), thus allowing the relatively limited IPv4 address space to meet the demands of an ever-expanding Internet.

#### IP Address

Every (publicly-addressable) host on the Internet has a unique IP address, similar to a telephone number. An IP address consists of decimal numbers, separated by points. Possible numbers are 0 to 255 inclusive.
Example: a possible IP address is 192.168.2.15.

At least one IP name in the form `hostname[[.subdomain]s].domain`, e.g. `kises.rz.uni-konstanz.de` is assigned to an IP address. This refers to a computer, named `kises`, which stands in the sub-domain `rz` of the sub-domain `uni-konstanz` of the `de` domain. As with IP addresses, the individual parts of the name are separated from each other by a point. Whereas, in contrast to IP addresses, IP names are not limited to four numbers. Moreover, several IP names can be assigned to one IP address, which are referred to as aliases.

#### Masquerading

Dynamic **Masquerading** is a technology based on NAT that allows an entire LAN to use one public IP address to communicate with the rest of the Internet.

**Example**: The administrator has established an internal LAN, and has given each computer on it IP addresses from the private IP range. One computer, for example, has the address 192.168.2.15. Only one, official IP address (e.g., 199.199.199.1) is assigned to all computers in its network, i.e. if only one HTTP request starts to the Internet, its IP address will be replaced by the IP address of the external network card. The data traffic for the external network (Internet) thus does not contain internal information. The answer to the request will be recognized by the firewall and forwarded to the requesting computer.

#### nslookup

Nslookup is originally a UNIX program designed to query name servers. The main application is the display of IP names in the case of a given IP number and vice versa. Moreover also additional functions, such as aliases can be displayed.

#### Port

While at the IP level, only sender and destination addresses are important, the TCP and UDP protocols both include the concept of ports. A port is an additional identifier – in the cases of TCP and UDP, a number between 0 and 65535 – that allows a computer to distinguish between multiple concurrent connections between the same two computers. TCP and UDP packets have both a sending port and a destination port.

**Protocol**

A protocol is a well-defined and standardized set of rules that govern how a client and server interact. Some well-known protocols and their associated services include HTTP (WWW), FTP (FTP), and NNTP (news).

**Proxy (Application Gateway)**

Proxies, often called application gateways, separate two networks at the network (IP or TCP/UDP) level, while still allowing certain kinds of communication. There can be no direct connection between an internal system and an external computer.
Proxies exclusively operation the application level. Proxies-based firewalls use a Dual-Homed Gateway that does not forward IP packets. Proxies, operated as specialized programs on the gateway, can now receive connections for a specific protocol, treat the transmitted traffic on the application level and forward it afterwards.

**RADIUS**

RADIUS stands for Remote Authentication Dial In User Service. It is a protocol designed to allow network devices such as routers to authenticate users against a central database.

**Router (Gateway)**

A router is a network device that is designed to forward packets to their destination along the most efficient path. Strictly speaking, a gateway is not always a router (it could be an application gateway, or proxy) – though a router is a kind of circuit-level gateway. When a computer wants to communicate with a server not on the local network, it must pass the data to a router in order for the packets to be forwarded to their destination: By convention, the highest or lowest address in the network range is used for the router: for example, in the network 192.168.179.0/24, the router will normally be at either 192.168.179.254 or 192.168.179.1.

**Server**

A server is a network-connected computer that offers services to client computers. Standard services include WWW, FTP, news, and so on. In order to make use of these services, the user will need a client program (e.g., Netscape) to communicate with the server.

#### SIP

The **Session Initiation Protocol** (**SIP**) is a signalization protocol for the set-up, modification and termination of sessions between two or several communication partners. The text-oriented protocol is based on HTTP and can transmit signalization data through TCP or UDP via IP networks. Thus it is the base among others for Voice-over-IP videotelephony (VoIP) and multimedia services in real time. In the multimedia subsystem, SIP is the base for connections, which are established via an IP network between cellular users. This enables cost-efficient communication forms such as Push to Talk over Cellular. SIP is defined in the RFCs 3261-3265.

#### SOCKS

SOCKS is a proxy protocol that allows a point-to-point connection between an internal and an external computer. SOCKS, often called the Firewall Traversal Protocol, is currently at version 5 and must be implemented in the client-side program in order to function correctly.

#### Subnet Mask

The subnet mask (also called netmask) of a network, together with the network address, defines which addresses are part of the local network and which are not. Individual computers will be assigned to a network on the basis of the definition.

#### UNC-Path

The **Universal Naming Convention** path is used primarily by computers running a Microsoft operating system to uniquely designate network resources. UNC paths are usually of the form \\Server\Resource.

#### Voice over IP

**Voice over IP** (**VoIP**) is the collective term for speech transmission via IP networks. In addition to the speech transmission, also video and interactive multimedia services are possible. To be able to realize these systems, Gatekeeper is used, the functions of which are defined in a series of standards. Particularly relevant are the standards H.323 and H.225, the RAS protocol and the H.225 Handshake process, RTP and RTCP.

# Index

# Notes