

# **User Guide**

## **ZENworks Application Virtualization Server 10.1**

December 2013

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# Overview

Thank you for using Novell ZENworks Application Virtualization!

ZENworks Application Virtualization Server enables you to launch applications instantly from websites, portals and client desktops; this saves time while reducing costs. Unlike traditional deployment methods, applications streamed from ZENworks Application Virtualization Server do not require download, installation, rebooting, administrative privileges, or separate setup steps. Applications hosted on ZENworks Application Virtualization Server, launch after less than ten percent of the application is transferred. ZENworks Application Virtualization Server's speed and efficiency are possible thanks to two technologies: Virtualization and Predictive Streaming.

## ZENWORKS APPLICATION VIRTUALIZATION SERVER TECHNOLOGY

ZENworks Application Virtualization Server advances the way virtual applications are delivered and used. This is possible through the ZENworks Application Virtualization and ZENworks Streaming technologies.

### ZENWORKS APPLICATION VIRTUALIZATION

Unlike other virtualization solutions that require an entire copy of the host operating system, ZENworks' application virtualization technology only emulates the features required to run application. ZENworks virtual applications have the same performance characteristics as native applications, but without any changes to system infrastructure.

The core of ZENworks Virtualization Technology is the ZENworks Virtual Machine (VM) kernel. Occupying less than a megabyte of storage and almost zero performance overhead, ZENworks kernel is a lightweight implementation of core operating system APIs, including file system, registry, process, and threading subsystems. ZENworks kernel is implemented entirely within the user-mode space, meaning ZENworks applications can run without any driver installation or administrative privileges.

ZENworks virtual applications interact with a virtualized file system, registry, and process environment contained in the kernel, rather than directly with the host device operating system. Requests are handled internally within the virtualized environment, but can also be redirected or overridden based on your configuration.

### ZENWORKS STREAMING

ZENworks' unique predictive streaming technology enables you to launch virtual applications five to twenty times faster than traditional downloadable applications.

ZENworks enables you to break down virtual applications into smaller functional and data units. ZENworks then identifies a prefetch (the application's vital data components for launch) and transfers the units first, enabling deployment when only a fraction of the total application is loaded. Once the prefetch is transferred, the application launches immediately. This occurs without any streaming servers or specialized protocols.

You can register applications to the local device after transfers complete. Registration moves content to a permanent location on your local device (making it available offline), and creates all application related Start Menu icons, Desktop shortcuts, and file associations.

## ZENWORKS APPLICATION VIRTUALIZATION SERVER FEATURES

ZENworks Application Virtualization Server enables you to accomplish the following goals:

- Host virtual applications on the web. You can stream ZENworks virtual applications from the ZENworks Application Virtualization Server portal site, custom external sites via HTML, or third-party collaborative web portals such as Microsoft SharePoint, IBM WebSphere, and Novell Teaming.
- Provide your organization with a single access point to your application portfolio. Instead of moving desktop-to-desktop to upgrade or install software, you can publish an application to ZENworks Application Virtualization Server's portal site; this provides licensed end-users with immediate access and full functionality.
- Launch applications faster over the Internet and intranets. ZENworks streamed applications launch five to twenty times faster than traditional downloadable applications. ZENworks Stream does not require any special ports or proprietary protocols.
- Empower a mobile workforce. ZENworks virtual applications require no installation or administrative privileges, meaning they can launch from anywhere, even on secure, locked-down desktops such as airport and hotel kiosks.
- Run multiple versions of applications side-by-side without conflicts or dependencies: ZENworks virtual applications run in isolated sandboxed environments. This enables you to avoid conflicts and dependency issues associated with natively-installed applications.
- Migrate with confidence to Microsoft Windows 7. ZENworks enables you to run legacy applications as they stand on newer operating systems, including Microsoft Windows 7, without the need to recode, retest, or reinstall.

## SUPPORTED PLATFORMS

ZENworks Application Virtualization Server is compatible with the following platforms:

- Microsoft Windows Server 2003 (**R2 not supported**)
- Microsoft Windows Server 2008 (all editions)
- Microsoft Windows Server 2008 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2012 R2

ZENworks Application Virtualization Server supports x86 (32-bit) and x64 (64-bit) processor architectures.

End-users can access ZENworks Application Virtualization Server from the following platforms:

- Microsoft Windows XP
- Microsoft Windows Server 2003
- Microsoft Windows Vista
- Microsoft Windows Server 2008
- Microsoft Windows Server 2008 R2
- Microsoft Windows 7

- Microsoft Windows 8
- Microsoft Windows 8.1

ZENworks Application Virtualization Server portals can be accessed from all major browsers including Microsoft Internet Explorer, Firefox, Safari, Google Chrome, Opera, and browsers built with the Gecko API.

**Note:** Versions of Internet Explorer prior to Internet Explorer 8 are not supported. If you are accessing the Portal Site with a newer version of Internet Explorer, but experiencing problems, be sure to disable compatibility mode. This feature is enabled automatically for intranet sites and emulated Internet Explorer 7 which is not supported by the Portal Site.

## Get Started With ZENworks Application Virtualization Server

In this section you will learn about system requirements and instructions for installing, configuring and running ZENworks Application Virtualization Server.

### ZENWORKS APPLICATION VIRTUALIZATION SERVER SYSTEM REQUIREMENTS

Install ZENworks Application Virtualization Server on a machine with a supported Microsoft Windows Operating System, at least 2GB of RAM and enough disk space to store all of the applications that will be hosted on the server. ZENworks Application Virtualization Server's web interface supports a screen resolution of 800 x 600, although 1024 x 768 or higher is recommended.

### UPGRADING

The new version of ZENworks Application Virtualization Server includes a new ZENworks Application Virtualization Console, an updated Portal Site and many other new features.

Database settings and application information will be migrated from the previous version of ZENworks Application Virtualization Server. To make changes to these settings, a fresh install is recommended.

When upgrading the ZENworks Application Virtualization Server the Windows service will restart. Be sure to alert users that the system is under maintenance before upgrading.

Applications that are registered to users' desktops with the old console are not compatible with the new console. When the old console is uninstalled these applications will be unregistered and will need to be registered from the new console. With the new console this process can be automated on application launch by enabling **Desktop Registration > Register on Launch** on the Application Detail page from the Administrator Site.

**Note:** After upgrading, all preexisting applications need to be updated with a new application version for Windows 8 compatibility. This does not require a new SVM file to be packaged in ZAV Studio, a new application version with the same SVM file is sufficient.

### SETUP

In this section you will learn how to use the Setup Wizard to automatically configure ZENworks Application Virtualization Server. For details regarding manual configuration of ZENworks Application Virtualization Server, refer to Manually Configuring ZENworks Application Virtualization Server.

Complete the following steps to set up ZENworks Application Virtualization Server:

1. Run the ZENworks Application Virtualization Server setup application.
  2. Select Next to start the installation wizard.
  3. Read the End User License Agreement, check the box and select Next.
  4. Use Destination Folder to choose where ZENworks Application Virtualization Server files are installed and select Install.
  5. After the installation process completes, choose the following configuration options:
    - a. Administrator email address: This is typically the ZENworks Application Virtualization Server system administrator's email address. Users are directed to this email address if they encounter any errors or issues while using ZENworks Application Virtualization Server.
    - b. Port assignments:
      - i. Administration site: The port used to access the Administration Site. For more information, refer to the Administration Site topic.
      - ii. Portal site: The port used to access the Portal Site. For more information, refer to the Portal Site topic. If Microsoft IIS is already on the machine port 80 is already in use. Verify that the ports assigned to the Administration and Portal sites are not already in use.
    - c. Click the **Advanced** button to specify connection information to an external SQL Server Database. When using an external SQL Server Database, be sure that the "Log On" user for the ZENworks Application Virtualization Server Windows Service has the appropriate access to the Database. It may be necessary to modify the Log On user for the service by editing the service details after installing ZENworks Application Virtualization Server.
- Note:** ZENworks Application Virtualization Server supports Microsoft SQL Server versions 2005 or newer. Any connection string format supported by Microsoft SQL Server may be used.
6. Select Setup to begin configuring ZENworks Application Virtualization Server.
  7. After setup is complete the Administration Site automatically opens and displays a web page where you can apply your license. Both evaluation and retail licenses are applied here. When purchasing or activating a retail license, note the Machine Identifier displayed on the License section of the Administration tab. This is necessary to complete license activation.
  8. Open the ports for the Administration and Portal sites (the Microsoft Windows Firewall blocks external connections to ZENworks Application Virtualization Server by default). For instructions on opening the ports, and for recommendations on how to best secure ZENworks Application Virtualization Server, refer to Configuring ZENworks Application Virtualization Server Security.
  9. Start using ZENworks Application Virtualization Server!

## LICENSING

The standard ZENworks Application Virtualization Server license, ZENworks Application Virtualization Server Enterprise Edition, consists of a server license and a custom number of unique or simultaneous end-users or devices. The standard license enables an unlimited number of applications to be hosted on ZENworks Application Virtualization Server.

Users are typically accounted for with a username and password. However, you can use anonymous users. In this case, each user is defined by the domain of the hosted ZENworks Application Virtualization Server and a specific username, such as SomeCompany\SomeUser. Any user may access the system on any number of machines within the same domain as the hosted ZENworks Application Virtualization Server without using additional user licenses. A separate license is used each time an application launches from a new machine outside of the domain with the hosted ZENworks Application Virtualization Server, regardless of the user login.

Each logged in user can only run applications from one device at a time.

*Tip: Minimize the number of seats consumed by having users login with the same domain as your ZENworks Application Virtualization Server.*

The ZENworks Application Virtualization Server administrator can activate and deactivate users as needed, or add additional allowed users or devices by upgrading the license. For more information about managing users refer to Managing Users. For instructions on applying a new license to ZENworks Application Virtualization Server, refer to Configuration and Customization.

## ADMINISTRATION SITE

ZENworks Application Virtualization Server has an administration site interface that enables ZENworks Application Virtualization Server administrators to manage and control all aspects of a ZENworks Application Virtualization Server instance, including:

- Licensing
- Applications
- Application categories
- Users
- Servers
- Customization

The Administration Site also provides detailed application usage analytics via pre-configured reports and a full-featured dashboard. The administration site is automatically configured during ZENworks Application Virtualization Server setup, and is assigned to port 81 by default. For more information about how to administer ZENworks Application Virtualization Server, refer to ZENworks Application Virtualization Server Administration.

## PORTAL SITE

The ZENworks Application Virtualization Server portal site is where you stream applications to your users. After applications are published they are displayed on the Portal Site, giving users one-click access to your entire



application library. The Portal Site automatically configures during ZENworks Application Virtualization Server setup and can be customized via the Administration Site. The Portal Site is assigned to port 80 by default.

## LOGGING IN

There are two settings for **Authentication Type**. The “Anonymous” setting allows users to launch applications without logging in. The “Log in using name and password form” setting requires users to log in with a username and password and users must provide valid credentials to access the portal.

Users who do not know their login information should contact the ZENworks Administrator to retrieve their credentials.

If the ZENworks Application Virtualization Server has more than one directory service, the directory prefix must be specified as part of the username. For example, if a user is under the Acme Directory Service with a login prefix ACME and a username aaron they would use the following login:

- Username: ACME\aaron
- Password: \*\*\*\*\*

The default prefix for users created through the ZENworks Application Virtualization Server interface is *local*. The same user under this Directory Service would use the following login:

- Username: local\aaron
- Password: \*\*\*\*\*

## USING THE HOMEPAGE

On the homepage for the Portal Site users see the ZENworks Web Desktop, which contains available published applications. To run applications from the portal, users must install the ZENworks Application Virtualization Sandbox Manager. For more information refer to *Install the ZENworks Application Virtualization Console*.

ZENworks Web Desktop contains the following links:

- All Applications: Lists applications you can launch as a user. Select any application to launch it.
- Named Categories: In the All Apps section of the desktop, you will see a list of categories: select that category to view applications in the category.

## LOGGING OUT

Authenticated users can log out of the ZENworks Application Virtualization Server Portal Site by selecting Logout in the upper right corner of the webpage.

## SIGNING IN AND OUT VIA THE ZENWORKS APPLICATION VIRTUALIZATION CONSOLE

After installing the ZENworks Application Virtualization Console, user can sign in or out by going to the icon in the System Tray or by hitting the keys “Alt + Windows.” If the user is not logged in, a login form will be available. If logged in, the user can click on the arrow next to their username and select “Sign Out” or “Exit.”

When specifying the URL in the login form, use one of the conventions below as appropriate:

- Using http on the default port (80): *http://<server>*
- Using http on any other port: *http://<server>:<port>*
- Using https (SSL) on the default port (443): *https://<server>*
- Using https (SSL) on any other port: *https://<server>:<port>*

## QUICK START

ZENworks Application Virtualization Server includes free, preconfigured applications that are immediately available from the Portal Site after install. Prior to launching ZENworks applications for the first time, end-users must download and install the ZENworks Application Virtualization Console.

### INSTALLING THE ZENWORKS APPLICATION VIRTUALIZATION CONSOLE

The ZENworks Application Virtualization Console interacts with the ZENworks VM kernel to enable virtual application streaming. The Portal Site automatically prompts users to download the plugin when they select an application.

Complete the following steps to install the ZENworks Application Virtualization Console:

1. Upon logging in to the Portal Site, users will be prompted to install the ZENworks Application Virtualization Console.
2. If the authentication mode is “Anonymous” users will be prompted to install the ZENworks Application Virtualization Console when they click on the “Run” button for an application in the Portal Site.
3. Select OK to begin downloading and installing the ZENworks Application Virtualization Console.
4. Your browser will ask you to Run or Save the executable. Select “Run”, or save the executable to your computer and then run it to launch the ZENworks Application Virtualization Console installer.

If you are updating the ZENworks Application Virtualization Console on your machine, ZENworks automatically uninstalls older versions if they have been idle for more than thirty days.

After the ZENworks Application Virtualization Console is installed on your device, complete the following steps to launch an application:

1. Navigate to the Portal Site in a web browser.
2. Select any application in the Portal Site and it will instantly stream to your desktop. Once the application is buffered, it launches automatically.
3. After you finish using the application, close it as you would a natively-installed application.

**Note:** The Spoon-Sandbox.exe process manages sandboxes of any running virtual applications launched with the plugin. This must run continuously; if that process is closed, all applications launched with the plugin close.

## PROXY SETTINGS

The ZENworks Application Virtualization Console has limited support for proxy settings. The Plugin uses proxy settings of the local device on which it is installed by default. These proxy settings can need to be changed to enable compatibility with the ZENworks Application Virtualization Sandbox Manager. End-users running Microsoft Internet Explorer can change proxy settings for the host device directly from within the browser. Users of other browsers must change proxy settings on the host device itself.

Complete the following steps to change system proxy settings on the host device:

1. Navigate to the Control Panel in your windows Start Menu.
2. Select the Internet Options icon.
3. Select the Connections tab, then LAN Settings.
4. Enter the proxy settings specified by your network administrator.

## ZENworks Application Virtualization Server Administration

The ZENworks Application Virtualization Server Administration Site enables you to manage and control all aspects of your ZENworks Application Virtualization Server. The default location of the Administration Site is:

<http://localhost:81>, and consists of the following links:

- Home: This is the default page for the ZENworks Application Virtualization Server Administration Site and also is the ZENworks Application Virtualization Server Dashboard. For more information refer to ZENworks Application Virtualization Server Dashboard.
- Apps: This page lists all applications currently on your ZENworks Application Virtualization Server, enables you to add new applications and application versions, and manage categories. For more information refer to Managing Applications and Managing Categories.
- Users: This page provides a list of active and inactive users on your ZENworks Application Virtualization Server, along with a license summary. For more information refer to Managing Users.
- Servers: This page lists all servers associated with ZENworks Application Virtualization Server, including the primary server as well as any additional external sites or third party web collaboration portals. For more information refer to Managing Servers.
- Reports: This page provides preconfigured customizable analytics reports, sorted according to Administration, Apps, and Users. For more information refer to Reports.
- Admin: This page contains a summary of your ZENworks Application Virtualization Server license, and information and options for configuring ZENworks Application Virtualization Server. For more information refer to Configuration and Customization.

## ADMINISTRATOR DASHBOARD

The ZENworks Application Virtualization Server Dashboard provides an overview of the ZENworks Application Virtualization Server over a given time period. You can adjust this time period using Date Range Control. The

dashboard is split into five sections: Top Apps, Volume, Key Statistics, Usage Breakdown, and Recent Activity. You can locate the dashboard by selecting the Home link from the Administration Site (it is also the default page for the Administration Site).

## TOP APPLICATIONS

Top Applications displays the top ten application versions. These are ranked by the number of times they were launched during a selected date range. Only application versions that are published and launched at least once during the selected date range appear in this list. Selecting the highlighted border links you to the application version page.

## VOLUME

The Volume graph charts the total number of launches for your ZENworks Application Virtualization Server over a specific date range. These are broken down into one day periods on the horizontal axis. Launches for unpublished application versions are not included.

## KEY STATISTICS

Key Statistics displays the following statistics for a selected date range:

- Apps: The number of unique application versions that were launched.
- Launches: The total number of application launches.
- Users: The number of unique users to launch an application.
- Devices: The number of unique devices used to launch an application.

## USAGE BREAKDOWN

Usage Breakdown provides detailed statistics for the top ten application versions over a selected date range, ranked by total launches, including:

- Launches: Total launches for that application version, followed by the total launches for that application version as a percentage of the total application launches. All launches, including those from the administrative portal, are counted in the number of launches.
- Users: Number of unique users who launched that application version, followed by the number of unique users who launched that application version as a percentage of the total unique users.
- Devices: Number of unique devices used to launch that application version, followed by the number of unique devices used to launch that application version as a percentage of the total devices used.

## RECENT ACTIVITY

Recent Activity provides a log of the most recent application launches, including the following:

- User: The user who launched the application.
- Application: The application that was launched, including the version number.

- Started: The date and time the user started using the application.
- Ended: The date and time the user closed the application.

## MANAGE APPLICATIONS

All applications on ZENworks Application Virtualization Server are managed from the Apps page of the Administration Site. Each new application is added to ZENworks Application Virtualization Server in the form of a ZENworks Virtual Machine, or SVM. For more information about SVMs and ZENworks Virtualization Technology refer to ZENworks Application Virtualization Server Technology.

### APPLICATIONS AND APPLICATION VERSIONS

ZENworks Application Virtualization Server manages ZENworks Virtual Machines (SVMs) using two entities: applications and application versions. Each application can contain one or more application versions. For example, Firefox can have child application versions for Firefox 3, Firefox 3.5 and Firefox 4. Each application version corresponds to a specific SVM.

### ADDING AN APPLICATION

Complete the following steps to add a new application to ZENworks Application Virtualization Server:

1. Navigate to the Apps page of the Administration Site.
2. Select Add App.
3. Enter the following information for the application:
  - a. Display Name: Application name visible to users.
  - b. Summary: Brief summary of the application.
  - c. Description: Detailed description of the application.
  - d. Icon: This is a 90 x 90 pixel JPG, GIF or PNG image representing the application displayed to end-users. If this field is left blank a default icon is applied. If an image is not 90 x 90 it is adjusted to fit the required dimensions.
  - e. Permissions: The default access level of the application. You can override this setting by user or group access.
  - f. Licensing: Restrictions on the number of users or devices that can execute the application. By default, users are only allowed to run an application on one device at a time.
  - g. Expiration: Restrictions on the time that users are permitted to execute this application.
  - h. Categories: Select the categories in which you would like the application to appear. For more information refer to Managing Categories.
  - i. Desktop Registration: Select “Enabled” to give end-users the option to add the application to their Start Menu. Select “Register on launch” to add the application to the end-users’ Start Menu automatically when the application is launched.
  - j. Shared Sandboxes: Select “Enabled” to keep existing application settings when new versions of the application are published. This is required for automatic updates to registered (added to Start Menu) applications.

4. Select Next. You will be brought to the Add App Version page to create the first version for this application.
5. Follow the steps under the "Adding an Application Version" section below. Test and/or profile your new app version, and press Save to commit your changes.
6. You can change the information on an application by selecting the display name of the application you wish to edit on the Apps page.

## MANAGING AN APPLICATION

You can manage an existing application by selecting the display name on the Apps page. This page enables you to revise the display name, summary, description, swatch, permissions, and categories for an application. This page also displays and links all versions that exist for the application. To delete an application, select the red X located to the right of the application on the Apps page.

## ADDING AN APPLICATION VERSION

A new application version must be added to an existing application. During this process you are required to upload an SVM; for information about how to create SVMs refer to [Creating Applications](#).

Complete the following steps to add an application version to an existing application:

1. Navigate to the Apps page of the Administration Site.
2. Select the green + to Add App Version, located to the right of the existing application. You can also add an application version on the details page of an application selecting Add at the bottom of the page in the versions section.
3. Enter the following information for the application version:
  - a. Version: The application version in Major.Minor.Build.Revision format. Only Major.Minor is required.
  - b. Summary: Brief summary of the application version; this defaults to the parent application summary if left blank.
  - c. Description: Detailed description of the application version; this defaults to the parent application description if left blank.
  - d. Icon: This is a 90 x 90 pixel JPG, GIF or PNG image representing the application version displayed to users. If this field is left blank, it defaults to the swatch for the parent application.
  - e. ZENworks VM File: Upload the ZENworks Virtual Machine file (SVM) for this application version. For information about how to create SVMs, refer to [Creating Applications](#).
  - f. Sandbox Sync: This feature automatically synchronizes application settings and state across client computers. This option is only for authenticated users.
4. Select "Next". This starts the upload process for the SVM file. Depending on the size of the application, this can take several minutes.

Note: There may be a long delay at the end of the upload process for SVM files over 500MB.

Note: SVM files over 2GB are too large to upload through the web interface. For these larger SVMs use the command-line interface which is documented under “Manage ZENworks Application Virtualization Server from the Command Line.”

5. After the upload is complete, the next screen will list the application name, version, entry points, test links, a checkbox for publishing and a link for optimizing the application. See “Managing an Application Version” for more information.
6. Click “Save” after making any updates to these settings and the new version now appears on the Applications page.
7. The application version will not be visible to users until it has been published. This setting can be enabled on the application version detail page.
8. It may take up to ten (10) minutes for new application versions to be visible in the Portal Site.

## MANAGING AN APPLICATION VERSION

To manage an application version, go to the application version detail page by clicking the version link next to the application on the Applications page, or by clicking on the version link in the application detail page.

This page contains the following sections:

- **Summary:** If changed, this overrides the summary for the application.
- **Description:** If changed, this overrides the description for the application.
- **Icon:** If changed, this overrides the icon for the application.
- **Entry Points:** This is where you specify the entry points of the virtual application you want to expose. The entry points are defined in the SVM file uploaded for the application version. Refer to [Managing an Entry Point](#) for details on customizing the appearance of an entry point.
- **Sandbox Sync:** This feature automatically synchronizes application settings and state across client computers. This option is only for authenticated users.
- **Published:** This controls whether the application version is visible to users on the Portal Site. You can have multiple versions of the same application simultaneously visible on the Portal Site; unpublish unwanted application versions.
- **Test Launch:** Selecting the Test link opens a new window which displays a link named Run for each entry point within the application, or a single link to launch the application version if no entry points exist. Selecting this link launches the application version. Use this feature to test application versions before publishing.
- **Adaptive Delivery:** This feature enables you to optimize delivery of an application version by configuring streaming. For detailed instructions on how to optimize an application version, refer to [Optimizing an Application Version](#). ZENworks recommends optimizing all application versions over ten megabytes. An optimized application version typically launches five to twenty times faster than a non-optimized application version.
- **Embed:** When this HTML code is embedded on an external webpage, it creates a ZENworks Virtual Application Feed button to launch the application version. For more information on customizing the ZENworks Virtual Application Feed refer to [ZENworks JavaScript API](#).

**Note:** The **Spoon\_Id** JavaScript variable is composed from the following: <Application Slug>-<Major version number>.<Minor version number>

**Note:** The embed code may not be backwards compatible between versions of ZAV Server. Please update and test the embed code for existing applications that are embedded on other sites when upgrading ZAV Server.

- Recent Activity: Provides a log of recent activity associated with the application version.

To delete an application version, select the red X located to the right of the application version in the details page of the parent application. You can also delete the application by selecting Delete at the bottom of the details page for the application version.

**Note:** It may take up to ten (10) minutes for application updates to be visible in the Portal Site.

#### OPTIMIZING AN APPLICATION VERSION (OPTIONAL)

Optimizing an application version enables you to launch five to twenty times faster than an application version without optimization. Optimization determines the best order for an application version's bytes to be transferred. ZENworks recommends optimizing all application versions over ten megabytes.

Complete the following steps to optimize an application version:

1. Navigate to the App Version page for the given application version.
2. Select the Optimize link located in the Adaptive Delivery section.
3. Select Profile App; this opens a new window that contains links to profile all entry points for the application version, or a single link for the application version if no entry points exist. Select Run and the application version will launch. Use the application as a typical user would for about one minute, then close the application. For best performance results, the duration of the profile (how long you use the application) should vary depending on the size of the SVM. As a general rule, the duration of a profile should be approximately equal to three seconds for each megabyte of the SVM. For example, one minute for a twenty megabyte SVM.  
**Note:** Any processes that are started by the application need to be shut down in order for the profile to complete and be recorded.
4. At least one profile should be taken from each platform users will run the application version from (optional). For example, if users are launching applications only on Microsoft Windows 7 and Microsoft Vista machines, at least one profile should be taken on each of those platforms. Repeat the first three steps on various platforms as needed.
5. Once all profiles are completed, navigate back to the Optimize page.
6. All profiles created are now visible in Profiles section of the page. These profiles are sorted by the various platforms they were taken on. Select the Update Model link to create a model and optimize the application version.



After the Model Status changes to Requested the model can take a few minutes to complete. When the Model Status reads Complete, this indicates that the application version has successfully optimized and will automatically stream to users when launched from the Portal.

**Note:** In order for an application to be profiled, the entire SVM package must be cached on the system where the profile is being created. This is not a concern for applications that do not have a streaming model because the entire SVM will be downloaded and cached. However, for applications that have a model, they will launch before the full SVM is cached. In this case, the application must be run long enough for the full SVM to be downloaded and cached in the background. At that point the application should be closed and a new profile can be created.

## MANAGING AN ENTRY POINT

The initial set of entry points corresponds the Shortcuts (Setup > Shortcuts) specified in the application configuration before building the SVM package. Although specific entry points available to an application are determined when creating an SVM file, the appearance of the entry point can be managed in ZENworks Application Virtualization Server.

Entry points add a level of complexity to managing applications and may lead to some confusion for users. It is preferable to create separate applications for the different entry points and eliminate entry points that have less value (help, uninstall, etc.). However, if it is important to limit cache size on the end user device or register applications into the same sandbox for application integration purposes, then entry points should be used.

Complete the following steps to manage an entry point:

1. Navigate to the Apps page of the Administration Site.
  2. Select the application version link that contains the entry point next to the parent application.
  3. Select the entry point link in the Entry Points section of the application version page.
  4. The page contains the following sections:
    - Name: Choose the entry point name that will be visible to users.
    - Slug: Choose a name to uniquely identify the entry point.
    - Icon: This is a 90 x 90 pixel JPG, GIF or PNG image representing the application version displayed to users. When this field is left blank it defaults to the swatch for the parent application version.
    - Embed: When this HTML code is embedded on an external webpage, it creates a ZENworks Virtual Application Feed button to launch this entry point. For more information on customizing the ZENworks Virtual Application Feed, refer to ZENworks JavaScript API.
- Note:** The **Spoon\_Id** JavaScript variable is composed from the following: <Application Slug>-<Entry Point Slug>-<Major version number>.<Minor version number>
- Apply changes to all entry points with the same slug in this application: This will update other versions of the application that share the same slug.
5. Select OK to save any changed information.
  6. The entry point can be tested from the Test link on the application version page.

You can expose or hide an entry point by selecting the check box under the Enabled column of the Entry Points section, then saving the application version.

## MANAGE APPLICATION CATEGORIES

Categories control the display and segregation of applications on the Portal Site. All categories are displayed on the left navigation bar of the Portal Site.

### ADDING A CATEGORY

Complete the following steps to add a new category:

1. Navigate to the Apps page and click the Add Category button on the bottom of the page.
2. Enter the following information:
  - Name: Category name displayed to users.
  - Description: Brief description of the category.
  - Members: List of applications in the category. Selecting the Delete icon removes the application from the category but does not delete it entirely. Use the Add button to add any applications to this category. Adds and removes do not take effect until after you select Save.
3. Select Save.
4. It may take up to ten (10) minutes for categories updates to be visible in the Portal Site.

### MANAGING CATEGORIES

Categories can be managed at the bottom of the Apps page. To revise the name or description of a category, select the category name in the listing. To delete a category select the Delete link in the category listing. Deleting a category does not delete or unpublish any applications associated with that category.

## MANAGE USERS

ZENworks Application Virtualization Server users are tracked and managed via the Administration Site. Users are entered manually or via automated import from LDAP or Active Directory directory services. Users can be viewed and managed on the Users page. You can also place users into groups to assign application permissions to multiple users at once. The Users page contains a list of existing users and user groups. From this page you can view user directories, status, recent activity and available actions. Displayed above the user list is the total number of licenses available and the number of licenses currently in use.

### MANAGING USERS

To manage a user, select the user name from the list on the Users page. The following fields are displayed on the page:

- Name: Full name of the user.
- Login Name: The unique login name for the user.

- **Directory Information:** Information about the directory service for the user if the user was imported from an external directory service.
- **Enabled:** Determines whether a user can launch applications from ZENworks Application Virtualization Server. After a user is disabled he no longer consumes a seat.
- **Quota:** Amount of data the user is allowed to store on the ZAV Server.
- **Permissions:** Special application permissions for the user.
- **Licenses:** Any licenses the user has acquired for applications with unique user limits.
- **Recent Activity:** A log of recent application usage.

## MANAGING USER GROUPS

To create a user group select Add Group. The Add User Group screen displays. This screen contains the following fields:

- **Name:** The group name that displayed on the user screen.
- **Description:** A group description (optional).
- **Members:** Users and groups that are members of this group. Users and groups are inherited when including other groups as members. Add users or other groups by selecting Add.
- **Permissions:** Special permissions associated with this group. Add permissions by selecting Add.

ZENworks Application Virtualization Server automatically creates an Anonymous Users group. Users discovered when the authentication mode is set to Anonymous are added to the Anonymous Users group. You can assign special permissions to these users by selecting Manage Anonymous Users at the top of the Users page.

## MANAGING USER PERMISSIONS

User Permissions enable you to allow or block users from running certain applications. These rules override default permissions. For example, you can block Firefox by default but allow user John Doe to launch the application. ZENworks Application Virtualization Server also supports nested groups: permissions for one group apply to users and groups within that group.

You can manage permissions from the user's or the group's Details page. Navigate to the Details page by selecting the user or group name on the Users page. Complete the following steps to manage permissions:

1. Locate the Permissions section on the appropriate Details page.
2. Create New permissions:
  - a. Select Add. A new page displays listing all applications and categories without existing permissions.
  - b. Select Permit for applications or application categories you want the user or group to use. Note: This makes a blocked application available to this user or group, unless overridden by another block permission for that application.
  - c. Select Block for applications or application categories you wish to block the user or group from using. Note: This overrides permissions for that user or group.

- d. Leave None selected for applications or application categories to use the default permission behavior.
- e. Select OK.

Note: Permissions are not saved until you select Save.

To Delete existing permissions select the red X next to existing permissions. This resets permissions to their defaults for that application or application category. These changes are not saved until you select Save.

Permissions for users and groups prioritize blocks over permits. If a user is blocked anywhere in their group hierarchy, he is blocked even if you permit him specifically.

## MANAGING USER LICENSES

User Licenses record how many unique users are using your applications. Licenses are only used for applications that have their Licensing set to a number of Unique Users. In the User Detail page, you can see a list of licenses that the User obtained. You can delete these licenses so other users can take a license and be one of the unique users allowed to use the application. Complete the following steps to delete a user license:

1. Select the red X adjacent to the license on the User Detail page.
2. Select Save.

To delete all user licenses for an application, navigate to the application page, then update the licensing settings to no longer use a unique number of users.

## ADDING AN EXTERNAL DIRECTORY SERVICE

Using ZENworks Application Virtualization Server you can add an external directory service, such as Active Directory. This enables you to manage users with the touch of a button. Complete the following steps to add an external directory service:

1. Open a ZENworks Application Virtualization Server administration site page in your web browser.
2. Choose the Users category from the top navigation bar.
3. Select Manage Directory Services.
4. Select Add Service. The Add Directory Service screen displays.
5. Enter your specific settings into ZENworks Application Virtualization Server. Each section is detailed below.

Section	Description
Name	<p>This field indicates which service is being added or controlled by the entry. The Name field must not be the same as the service or server you are using.</p> <ul style="list-style-type: none"> <li>• Description is optional, but can prove helpful to record notes about this service.</li> <li>• Login Prefix can be used when signing in using a name like acme\aaron to differentiate</li> </ul>

	<p>themselves users from another directory service, such as ZENworks\aaroon. Once specified a name cannot be changed. If you must change the name, the directory service can be deleted and a new one added for the same directory; settings for all users from that directory service are lost.</p>
Type	<p>In the Type section you can choose the type of the directory service from which to import users and groups. There is variability in location, security, and schema settings for directory services. ZENworks Application Virtualization Server provides two templates: Active Directory and Other LDAP. The local Active Directory can be found by selecting Try Local. When found, working connection settings are set automatically.</p> <p>To synchronize with the local Microsoft Windows domain's Active Directory service, select Try Local. This loads default settings into the Connection and Directory Schema fields. For large directories this can take several minutes.</p> <p>If the operation is unsuccessful, continue to the Choosing Your Connection Settings section.</p> <p>If the operation is successful, continue to the Choosing the Directories to Synchronize section.</p>

## CHOOSING YOUR CONNECTION SETTINGS

Complete the following steps to choose your connection settings:

1. Enter the settings for the Server section. The Host, Port, and Top directory are initialized with typical values, but you can customize them to match your directory service settings. They are best discovered using the management tools for the application that hosts them, such as [Microsoft Windows](#) or [Apache Directory Services](#).
  - o The Top directory should be specified to avoid potential login issues that are difficult to troubleshoot.
2. Set the Binding Type. Changing the Binding Type will change the Port to the standard LDAP port number for that setting, if you have not specified another port number.
  - o Choosing the Simple binding type is not recommended if you are binding to Active Directory, but it can be useful while on the page in diagnosing connection problems via the Test button.
3. Enter your credentials at the Synchronization Account section. To connect with a specific account in the Synchronization Account section, specify the username:
  - o Active Directory: The domain login (e.g. acme\aaroon)
  - o Generic LDAP: The distinguished name (e.g. uid=aaroon,ou=acme,ou=system)
4. To test these settings, click on the Test button.
5. Once the test is successful, proceed to the Directory Schema section.

## DIRECTORY SCHEMA

Directory schema settings are customizable within any directory service; you can change these settings to match the names in your directory service. The most common schema values are tried by selecting Discover. You can select Discover when you are not satisfied with the result in the Synchronized Directories section. Complete the following steps to use the Discover functionality:

1. Select Refresh from the Synchronized Directories section and inspect the results. If the users and groups shown there are accurate, leave the directory schema settings as they are.
2. If the Synchronized Directories does not accurately depict the users and groups you expect, select Discover and wait for the schema settings text boxes to fill with the recommended values. Test these values at any time from using Refresh in the Synchronized Directories section.
3. If you know the correct schema name for the given properties, you can enter it manually. If there are more than one name for the same value you can enter each name separated by a semicolon. Each is searched during synchronization.
4. To reset the settings to the ZENworks Application Virtualization Server default, select Defaults.

## CHOOSING ITEMS TO SYNCHRONIZE

You may limit the scope of users and groups that will be synchronized from your directory service, either by choosing specific directories within the service, or by selecting the user groups in which you are interested.

### Choosing Directories

Your directory service might contain some subdirectories that have useful information and others that contain unwanted information. You can choose which subdirectories to synchronize using Synchronized Items, selecting the Directories option. Complete the following steps to use Synchronized Items:

1. Select Refresh to use the current connection and directory schema settings to scan your directory service. Information about discovered sub-directories is available via tooltip popups. For large directories this operation can take several seconds to complete.
2. To narrow the scope of your synchronization to specific directories complete the following:
  - a. Uncheck Include All.
  - b. Check directories to include.

### Choosing Groups

You may have a specific subset of existing users that will use ZENworks Application Virtualization Server, in a group or groups native to your directory service. You can choose which groups to synchronize using Synchronized Items, selecting the Groups option. Complete the following steps to use Synchronized Items:

1. Select Refresh to use the current connection and directory schema settings to scan your directory service. Information about discovered group is available via tooltip popups. For large directories this operation can take several seconds to complete.
2. To narrow the scope of your synchronization to specific groups complete the following:
  - a. Uncheck Include All.
  - b. Check groups to include. All members of that group will be synchronized, including contained groups and all of their members.

When you are satisfied with your settings, select Save. At this point, the users and groups in your directory service are not synchronized with ZENworks Application Virtualization Server. From the Manage Directory Services page,

click the synchronization button and verify there are positive counts for users and/or groups when it has finished. For large directories this can take several seconds.

## MANAGE SERVERS

Depending on the scope of your ZENworks Application Virtualization Server implementation you can add additional servers to distribute the workload and improve performance. If you are deploying applications from an external site on another server, you must add that server to ZENworks Application Virtualization Server.

### ADDING A SERVER

Complete the following steps to add a new server:

1. Navigate to the Servers page.
2. Select Add Server.
3. Enter the following information for the server:
  - a. Name: A name for the server. This does not have to match the machine's network name.
  - b. Role: The role the server plays in the network. Choose from the following:
    - i. Content: Hosts application files.
    - ii. Manager: Hosts administration web pages, web services, and databases.
    - iii. Portal: Provides access to applications through a web interface.
  - c. Web Address: The root URL for accessible files. Be sure to put HTTPS for SSL implementations.
  - d. File Path: The file path mapped to by the web address. For example, \\myhost\mysiteroot\.
4. Select Save.

### MANAGING SERVERS

Servers are listed on the Servers page. Select the server name in the listing to revise the name, web address, or admin site address. You can add or edit the location of the SSL certificate files on the manager server. For example, [c:\ssl\certificate.crt](#) and [c:\ssl\certificate.key](#).

The file path cannot be revised; in order to specify a different file path, you must delete the server and add a new one with the correct file path. To delete a server, select the Delete icon in the server list. You cannot delete the server named Primary.

### CONFIGURING A CONTENT SERVER

Application files are hosted by the Manager Server and synchronized to any Content Servers that have been created. This synchronization is handled by the ZENworks service running on the Management Server which runs under the Local System account by default. In order for the synchronization process to work, the Management Server machine account must be given access to the specified folder on the Content Server machine. Below are the steps to accomplish this:

### **Share the folder on the Content Server where the application files will be stored**

1. Go to the Content Server folder that will be shared
2. Right click and select Properties
3. Go to Sharing -> Advanced Sharing ...
4. Click on Permissions
5. Click Add under [Group or user names](#)
6. Click Object Types, select Computers and click OK
7. Enter the machine name of the Manager Server in the [Enter the object names to select](#) section
8. Click Check Names to confirm that the machine can be found on the domain
9. Click OK
10. Select the machine name for the Management Server in the [Group or user names](#) section
11. Select Full control under the Allow column in the [Permission for](#) section
12. Click OK

### **Set permissions to the folder on the Content Server where the application files will be stored**

1. Go to the Content Server folder that has been shared
2. Right click and select Properties
3. Go to Security
4. Click Edit under [Group or user names](#)
5. Click Add under [Group or user names](#)
6. Click Object Types, select Computers and click OK
7. Enter the machine name of the Manager Server in the [Enter the object names to select](#) section
8. Click Check Names to confirm that the machine can be found on the domain
9. Click OK
10. Select the machine name for the Management Server in the [Group or user names](#) section
11. Select Full control under the Allow column in the [Permission for](#) section
12. Click OK

## **REPORTS**

The Reports page provides pre-configured, detailed analytic reports, broken-down into categories. Selecting a report takes you to the Report page, which consists of a Date Range control and the Report Viewer. Use the Date Range control to adjust the time period for the selected report.

### **ADMINISTRATION REPORTS**

- **Session Logs Report:** Provides a detailed record of all session events, including launching or stopping an application.
- **Alert Report:** Presents a record of all ZENworks Application Virtualization Server alerts. Common alerts include errors, creation of applications, application versions, categories.



## APPLICATION REPORTS

- App Inventory Report: Provides detailed information for each application in your ZENworks Application Virtualization Server.
- App Session Report: Presents a detailed record of each application session.
- App Usage Report: Provides a detailed breakdown and comparison of the usage for each application.

## USER REPORTS

- User App Usage Report: Provides a record of all application usage, broken-down by user.
- User Usage Report: Presents a detailed breakdown and comparison of application usage for each user.
- User Session Report: Provides a detailed record of each application session, broken-down by user.

## REPORT VIEWER

Use the toolbar located at the top of the Report Viewer to perform the following tasks:

- Navigate through report pages using the left and right arrows.
- Export the report to a file in any of the following formats:
  - Adobe Acrobat (PDF) file
  - CSV (comma delimited)
  - Microsoft Excel
  - Rich Text Format
  - TIFF File
  - Web Archive
- Refresh the report.
- Print the report.

## CONFIGURATION AND CUSTOMIZATION

The Admin page provides options to configure and customize ZENworks Application Virtualization Server. The page is divided into the following sections:

- License: Provides an overview of information associated with the current ZENworks Application Virtualization Server license, including number of seats, allowed portals, computer name, and machine identifier. If server users are licensed to run applications on more than one machine, this number is reflected here. This section also contains a link to add a New License; you can use this to update an existing license as well.
- Sync: Configures client synchronization settings.
- Administrator Email: Users are directed to this email address if they encounter any errors or issues while using ZENworks Application Virtualization Server.
- Administrators: The administrative web pages can be restricted to a subset of the users known to the ZENworks Application Virtualization Server. If no users are contained in this group, access will be open to

anyone able to access the port of the administration site. When at least one user is contained in the group, a login form is presented to any user who hasn't already been authenticated from his browser. Only the members of the administrators group (including members of groups that are members of the administrators group) are allowed access. Note that this group appears in the standard user groups list and is editable from there as well. SSL access to the administration site can be enabled by editing the primary server settings, exactly as it is done for a portal site.

- Logo: This image appears at the top of the Portal site. The image is resized to a width of 185 pixels (with the aspect ratio maintained), and is converted to .PNG format.
- Authentication Type: Authentication type that users must supply to access applications. Folder sync and app sync are not available to anonymous users.

## SYNCHRONIZATION

Synchronization settings are found by selecting Sync Settings on the Administrative Settings page. There are two options which are available to configure:

- Storage Path: the physical location where sync data is stored on the web server. This directory must be accessible from the primary portal web server. The value can be a local path or a path to a UNC share, such as \\myhost\sharename.
- Quota: the amount of sync data users can keep on the server. The default is 100MB, but can be any value up to 2,000,000,000MB.

## CREATE APPLICATIONS

In this section you will learn how to create ZENworks applications that can deploy from ZENworks Application Virtualization Server. ZENworks applications are created from existing applications by converting them into SVM file format. For more information about adding an existing SVM file to ZENworks Application Virtualization Server, refer to Managing Applications.

## VIRTUALIZE APPLICATIONS IN ZENWORKS APPLICATION VIRTUALIZATION STUDIO

To be hosted on ZENworks Application Virtualization Server applications must be converted into ZENworks Virtual Applications (SVM files) using ZENworks Application Virtualization Studio. ZENworks Application Virtualization Studio monitors the installation of your application, analyzes the installation, and constructs a virtual package which you can upload to ZENworks Application Virtualization Server. Experienced users can convert most applications for ZENworks in minutes.

To create an SVM using ZENworks Application Virtualization Studio, Project Type must be set to Component. Virtual applications with compressed payloads cannot be optimized for streaming using ZENworks Application Virtualization Server. To build a streaming virtual application, Compress Payload in Settings must remain unchecked during the build process.

Refer to the ZENworks Application Virtualization Studio help documentation for detailed instructions on how to create a ZENworks application.

## PUBLISH APPLICATIONS

In this section you will learn about deploying applications to users with ZENworks Application Virtualization Server.

### PUBLISH TO THE ZENWORKS APPLICATION VIRTUALIZATION SERVER PORTAL

The ZENworks Application Virtualization Server Portal Site is the default mechanism for delivering streaming applications to your users. The Portal Site automatically configures during ZENworks Application Virtualization Server setup and can be customized via the Administration Site. The default location of the site is: <http://localhost/>.

To make an application visible on the Portal Site, publish an application version on the Administration Site. For more information refer to Managing Applications.

### PUBLISH TO AN EXTERNAL SITE

ZENworks Application Virtualization Server supports delivery from custom external websites with additional license certification. Standard ZENworks Application Virtualization Server licenses allow two sites by default: the Administration and Portal Sites. You can upgrade license certificates to enable application delivery from external sites: contact your ZENworks sales representative.

When adding a portal site hosted on another server, you must add that server on the Servers page of the Administration Site. The role of the new server must be set to Portal. When sending users the link to an external site, verify that the link matches the web address entered. For more information about adding a new server refer to Managing Servers.

### UTILIZING EMBED CODE

After creating an application version, you will find HTML code located on the application version page in the Embed section. A ZENworks Virtual Application Feed can be set up for any ZENworks Application Virtualization Server with a valid license and published apps. The feed can be added to any website by adding a few lines of HTML. Example feed:

```
<script type="text/javascript">
Spoon_PortalRoot = 'http://<server name>';
Spoon_Id = '<application slug>-<application major version>.<application minor version>';
</script>

<script language="javascript" type="text/javascript" src="http://<server name>/Feed/"></script>
```

### ZENWORKS VIRTUAL APPLICATION FEED PARAMETERS

This section outlines the possible parameters for the ZENworks Virtual Application Feed.

Parameter Name	Javascript Type	Required	Description
----------------	-----------------	----------	-------------

Spoon_PortalRoot	String	Yes	This is the Portal Site URL
Spoon_Id	String	Yes	This is the Application identifier.
Spoon_BackgroundColor	String	No	This sets the background color for the feed button.

## AUTO LAUNCH APPLICATIONS FROM THE PORTAL SITE

Applications can be auto launched on the Portal Site by passing an additional parameter in the URL. The standard URL for the application detail page is *http://[Server]/apps/[Application Slug]*. To have the application auto-launch, simply append a parameter to the end of the URL, *http://[Server]/apps/[Application Slug]?run=true*.

## PUBLISH USING THIRD-PARTY SOFTWARE

You can integrate ZENworks Application Virtualization Server third-party web collaboration tools and portal software, such as:

- Microsoft Office SharePoint Server
- Novell Teaming
- IBM WebSphere

Publishing an application to a third-party web portal requires the same license certificate upgrade required for publishing to a custom external site. For more information about license upgrades needed to publish on an external site and how to utilize ZENworks embed code refer to Publishing to an External Site.

## ZENWORKS APPLICATION VIRTUALIZATION SERVER WALKTHROUGHS

In this section you will find step-by-step instructions for configuring and using ZENworks Application Virtualization Server in common deployment scenarios.

### ADD AN APPLICATION TO ZENWORKS APPLICATION VIRTUALIZATION SERVER

In this section you will learn how to add your organization's software to ZENworks Application Virtualization Server and make it instantly available to users within your enterprise.

#### CREATE A VIRTUAL APPLICATION

Adding an application to ZENworks Application Virtualization Server requires you to create a virtual version of the application using the ZENworks Application Virtualization Studio packaging tool.

To create a ZENworks Virtual Machine (SVM) for your application using ZENworks Application Virtualization Studio:

- Use ZENworks Application Virtualization Studio to create an SVM using the snapshot or template process. Refer to the ZENworks Application Virtualization Studio help documentation for detailed instructions on creating virtual applications.

The evaluation version of ZENworks Application Virtualization Studio creates time trial virtual applications. To create applications that do not expire, obtain a retail license for ZENworks Application Virtualization Studio.

#### ADD THE APPLICATION TO ZENWORKS APPLICATION VIRTUALIZATION SERVER

After the SVM is created add the application to ZENworks Application Virtualization Server. For more information on managing applications and application versions in ZENworks Application Virtualization Server, refer to Managing Applications. Complete the following steps to add a new application to ZENworks Application Virtualization Server:

1. Navigate to the Apps page of the Administration Site.
2. Select Add App.
3. Enter the following information for the application:
  - Display Name: Application name that visible to users.
  - Summary: Brief summary of the application.
  - Description: Detailed description of the application.
  - Icon: A 90 x 90 pixel JPG, GIF or PNG image that represents the application displayed to end users. If this field is left blank a default icon is applied to the application. In the image is not 90 x 90, it is adjusted to fit the required dimensions.
  - Permissions: The default access level to the application. You can override this setting by explicit user or group access.
  - Licensing: Restrictions on the number of users or devices that can run the application.
  - Default Expiration Date: Restrictions on the time that users are permitted to execute this application.
  - Categories: Select the categories you want the application to appear in on the Portal Site. For more information about managing categories, refer to Managing Categories.
4. Select Save.

After the application is added to ZENworks Application Virtualization Server, create a specific application version and upload the SVM. Complete the following steps to upload the SVM file as a new application version:

1. Navigate to the Apps page of the Administration Site.
2. Select “Add app version”
3. Enter the following information for the application version:
  - Version: The application version in Major.Minor.Build.Revision format. Only Major.Minor is required.
  - Summary: Brief summary of the application version; defaults to parent application summary if left blank.
  - Description: Detailed description of the application version; defaults to parent application description if left blank.

- Icon: A 90 x 90 pixel JPG, GIF or PNG image that represents the application version displayed to users. If this field is left blank, it defaults to the swatch for the parent application.
  - ZENworks VM File: Upload the ZENworks Virtual Machine file (SVM) for this application version. For information about creating SVMs, refer to [Creating Virtual Applications](#).
  - Sandbox Sync: Automatically synchronizes application settings and state across client computers. This is only applicable to authenticated users.
4. Select Save. The SVM file will upload to ZENworks Application Virtualization Server. Depending on the size of the application this can take several minutes.

## OPTIMIZE THE APPLICATION VERSION (OPTIONAL)

Optimizing an application version typically results in a five to twenty times faster launch. Optimization determines the best order for bytes to be transferred. ZENworks recommends optimizing all application versions over ten megabytes.

Complete the following steps to optimize an application version:

1. Navigate to the Apps page of the Administration Site.
2. Select Name from the Apps list.
3. Navigate to Versions and select your application version.
4. Select Optimize, located under Adaptive Delivery.
5. Select Profile App to open a new window with a Run link for each application entry point.
6. Choose a Run link and use the application as a typical user for about one minute, then close the application. For the best performance results, the duration of the profile should vary depending on the size of the SVM. The duration of a profile should be approximately equal to three seconds for each MB of the SVM. For example, one minute for a twenty megabyte SVM.
7. ZENworks recommends taking a profile from each platform that users will run. For example, if users are launching applications on Microsoft Windows 7 and Microsoft Vista machines, at least one profile should be taken on each of those platforms. Repeat steps 1-3 on various platforms as needed.
8. Once all profiles are complete navigate back to the Optimize page.
9. All created profiles should be visible in the Profiles section of the page. These profiles are sorted according to the platforms they were taken on. Select Update Model to create a model and optimize the application version.
10. After the model status changes to Requested it typically takes a few minutes to complete. When the model status reads Complete, this indicates that the application version is successfully optimized and will automatically stream to users when launched from the Portal Site. You must refresh the Optimize page to view updates to model status.

To add additional profiles to the model, simply navigate back to the Optimize page, and click the Profile App link. Any new profiles that are taken will show up in the Profiles section as "Unused." Clicking the Update Model link will apply these profiles to the model.

## PUBLISH THE APPLICATION

ZENworks Application Virtualization Server enables administrators to test application versions prior to publishing. Complete the following to test the application version:

- Navigate to the Apps page of the Administration Site.
- Select the application Name from the Apps list.
- Navigate to the Versions section and select your application version.
- Select Test to open a new window with a Run link for each application entry point.
- Choose a Run link and the application version will launch. This behavior is identical to the end user experience.
- To make the application visible on the Portal Site, publish the application version by selecting the Published box on the application version page, then Save.

## ZENWORKS APPLICATION VIRTUALIZATION SERVER ADVANCED TOPICS

This section describes advanced topics you may encounter when implementing ZENworks Application Virtualization Server.

### RUNNING APPLICATIONS WHEN OFFLINE

Applications may be configured to run when users are offline. To enable this, the application needs to be registered to the desktop and fully cached. In order to know if an application is available offline, take the following steps:

- Verify that **Desktop Registration** is enabled in the application details page in the ZENworks Application Virtualization Server Administrator Site.
- Sign into the ZENworks Application Virtualization Server from the plugin
- Click on All Applications at the top
- Click on the desired application to open the Application Details
- Right Click on the application version
- The context menu will state whether the application is available offline or online only
- If the application is available online only and “Add to Start Menu” is available, select “Add to Start Menu”
- Make sure the application is added to the start menu
- Run the application from the Windows **Start Menu** and wait several minutes for the application to become available offline

### MIGRATING SYNC DATA WHEN CHANGING THE STORAGE PATH

When specifying a new **Storage Path** for sync data the existing sync data is not automatically migrated. Follow these steps to migrate existing data.

1. Go to the ZAV Server Administrator portal
2. Click on the Admin button at the top of the page and update the **Storage Path** under the **Sync Settings**
3. Stop the ZAV service
4. Copy all the data from the current **Storage Path** to the new location
5. Restart the ZAV service

## MANUALLY CONFIGURE ZENWORKS APPLICATION VIRTUALIZATION SERVER

ZENworks Application Virtualization Server enables you to manually configure settings during setup. Using this process you can control the database connection strings used by ZENworks Application Virtualization Server and the domain names for the Administration and Portal Sites.

Complete the following steps to install ZENworks Application Virtualization Server:

1. Download the ZENworks Application Virtualization Server setup file and save it locally.
2. Open a Microsoft Windows Command Prompt and navigate to the directory of the saved setup file.
3. Enter the following command: `Setup.exe /noprovision`. This brings up a file installation wizard. Navigate through the prompts until file installation is complete, and then select Finish.

Complete the following steps to manually configure ZENworks Application Virtualization Server:

1. Return to the Microsoft Windows Command Prompt and navigate to the directory where the installation files are saved. You specified this location in the previous step; the default location is “C:\Program Files\Novell\ZENworks Application Virtualization Server”.
2. To manually configure ZENworks Application Virtualization Server, type the command: `Server.exe /provision [ADMINISTRATOR EMAIL]`. Add any of the optional command-line arguments from the following table. Omitting any command-line arguments causes the default setting to apply. The **manager** and **library** databases will be created during the install process.

Command Line Argument	Setting
<code>/dblibrary [Microsoft SQL Server connection string]</code>	Configures the connection string for the library database.
<code>/dbmanager [Microsoft SQL Server connection string]</code>	Configures the connection string for the manager database.
<code>/wwwsite http://www.[MYSITE].com:[PORT]</code>	Assigns the port and fully qualified domain name for the portal site.
<code>/admins site http://www.[MYSITE].com:[PORT]</code>	Assigns the port and fully qualified domain name for administration site.

The following is a sample command to set all four settings:

```
Server.exe /provision admin@acme.com /dblibrary "Integrated Security=true;Data Source=acme;Initial Catalog=Library;" /dbmanager "Integrated Security=true;Data Source=acme;Initial Catalog=Manager;" /wwwsite http://www.acme.com /admins site http://www.acme.com:81
```

**Note:** The Microsoft SQL Server connection string will depend on the Microsoft SQL Server configuration. ZENworks Application Virtualization Server supports Microsoft SQL Server versions 2005



or newer. Any connection string format supported by Microsoft SQL Server may be used. For more information about the connection string, contact the database administrator. Before configuring the ZENworks Application Virtualization Server, confirm that the running user for the Windows service has appropriate access rights to the database. The service runs under the *Local System* account by default but the running user can be changed in the Windows services settings.

3. Select *Enter* to submit the command and choose “Y” to proceed.

## CONFIGURE ZENWORKS APPLICATION VIRTUALIZATION SERVER SECURITY

This section explains how to configure ZENworks Application Virtualization Server's security settings on common Microsoft Windows platforms. These settings restrict external connections to the Administration Site, enable external connections to the Portal Site and enable the ZENworks JavaScript API for use with external web portals.

Note: To enable remote administration for external connections apply the instructions below.

### MICROSOFT WINDOWS SERVER 2003, MICROSOFT WINDOWS XP, AND MICROSOFT WINDOWS VISTA

To configure ZENworks Application Virtualization Server security on Microsoft Windows Server 2003, Microsoft Windows XP, or Microsoft Windows Vista, you must enable Microsoft Windows Firewall. The default settings of Microsoft Windows Firewall block all external connections to the Administration Site (assigned to port 81 by default) and Portal Site (assigned to port 80 by default). After Microsoft Windows Firewall is enabled, you must add exceptions to the default settings to provide licensed users access the Portal Site and the ZENworks JavaScript API.

Complete the following steps to enable Microsoft Windows Firewall on Microsoft Windows Server 2003 with licensed access to the Portal Site:

1. Open the Control Panel and select Microsoft Windows Firewall.
2. Turn Microsoft Windows Firewall on.
3. Open the Exceptions tab.
4. Click Add Port.
5. Assign a name to the exception and set Port to the Portal Site port assigned during installation (the default is port 80).

### MICROSOFT WINDOWS SERVER 2008 AND LATER

To secure the ZENworks Application Virtualization Server Administration Site, enable Microsoft Windows Firewall with Advanced Security. The default settings of Microsoft Windows Firewall with Advanced Security block all external connections to the Administration Site (assigned to port 81 by default) and the Portal Site (assigned to port 80 by default). After Microsoft Windows Firewall with Advanced Security is enabled, add exceptions to the default settings to provide licensed users with access the Portal Site and the ZENworks JavaScript API.

Complete the following steps to enable Microsoft Windows Firewall with Advanced Security on Microsoft Windows Server 2008 with licensed access to the Portal Site:

1. Open the Control Panel and select System and Security.
2. Open Administrative Tools, then select Windows Firewall with Advanced Security.
3. Select Inbound Rules and choose New Rule.
4. Select Port.
5. Select TCP and Specific local ports. Add the port assigned to the Portal Site during installation (the default is port 80).
6. Select Allow the Connection.
7. Select the domain, private, and public profiles.
8. Add a name and description.

## MANAGE ZENWORKS APPLICATION VIRTUALIZATION SERVER FROM THE COMMAND LINE

Server.exe, located in the installation directory of ZENworks Application Virtualization Server (usually “C:\Program Files\Novell\ZENworks Application Virtualization Server”), can be used as a command-line tool by specifying the admin option. This tool enables you to add and update applications to the ZENworks Application Virtualization Server library from the command line, and add large applications (over 2GB) to the ZENworks Application Virtualization Server. The ZENworks Application Virtualization Server administrator portal does not support uploading SVM files over 2GB.

### REQUIREMENTS FOR USING SERVER.EXE

- Run the command window as Administrator (right-click Run as Administrator).
- Each application must be uniquely named. This prevents a naming collision.
- Application version numbers must be in the correct format [major].[minor].[buld].[revision].
- Not all languages are supported at this time.
- Valid architecture specifications include x86, x64, and AnyCpu.
- When working in the command window place quotation marks around paths that include a space.

### SERVER.EXE COMMAND FORMAT

Server.exe can be used with the following arguments to manage provisioning, uninstall, upgrade, and service recycling:

Option	Description
Server.exe /provision  Required parameters: [ZENworks admin email address]  Optional parameters:	Creates the ZENworks Application Virtualization Server data and sites.

/dblibrary [library database connection] /dbmanager [manager database connection] /adminsited [administration site URL] /wwwsite [portal site URL] (creates a new ZENworks deployment originating from this server) /silent (installs ZENworks without user prompt)	
Server.exe /uninstall	Uninstalls ZENworks from this server.
Server.exe /restart  Required parameters: [Apache process Id]	Restarts Apache web service gracefully.
Server.exe /?, -?, ?, /help, -help, help	Prints this usage information.

#### SERVER.EXE ADMIN COMMAND FORMAT

Server.exe can also be used to create and update applications, as well as to manage other server settings. This is done by specifying any of the given topics after the Server.exe admin command.

#### Server.exe admin /create

Option	Description
Server.exe admin /create  Required parameters: /a [app display name]  Required parameters for new version: /f [full path to .svm or file]  Required for .svm files: /v [app version]  Optional for .svm files: /lang [IETF code like "en-us"] (default is system language) /sku [SKU name] (default is "Default") /arch [architecture like x86 or x64]	Creates a new application or a new application version. In order to create an application version the application must be created first.

(default is AnyCpu)	
---------------------	--

Examples:

- Create a new application (must do this before creating an application version): *Server.exe admin /create /a "My Application"*
- Create a new application version: *Server.exe admin /create /a "My Application" /v 1.0.0.0 /f "D:\Installation Files\myapplication.svm"*

### Server.exe admin /license

Option	Description
print, (none)	Prints the current license.
set <file>	Sets the license to the contents of the given text file.
help, h, ?, -?, /?, etc.	Prints help information.

Examples:

- Print the current license: *Server.exe admin /license print*
- Set the current license: *Server.exe admin /license set ss-license.txt*

### Server.exe admin /directory-services

Option	Description
print, (none)	Prints the current list of directory services.
new <login prefix>	Creates a new directory service with default settings.
delete <login prefix>	Deletes the given service.
help, h, ?, -?, /?, etc.	Prints help information.

Examples:

- Print the current directory services: *Server.exe admin /directory-services*
- Create a new directory service with prefix "loc": *Server.exe admin /directory-services new loc*
- Delete the "loc" directory service: *Server.exe admin /directory-services delete loc*

### Server.exe admin /directory-service

Option	Description
--------	-------------

discover-local-ad	Attempts to connect to local Active Directory. If it succeeds, the connection and schema settings are printed.
-------------------	--

**Server.exe admin /directory-service <login prefix>**

Option	Description
print, (none)	Prints the current settings for the directory service.
<property>	Prints the current value of <property>.
<property> <value>	Sets the value of <property> to <value>.
set [<file>]	Imports the settings from a file, or standard input if no file is specified. Settings files are in the same format as the output of the print function.
discover-local-ad	Attempts to connect to local Active Directory. If it succeeds, the connection and schema settings are printed.
discover	Scans the directory service for recommended schema settings.
directories	Prints the subdirectories within this directory service.
groups	Prints the user groups within this directory service.
sync	Synchronizes users and groups from the directory service.
items	Prints the current synchronized items.
items add (Group Subdirectory) <distinguished name>	Adds an item to be synchronized.
items clear	Deletes all sync items.
help, h, ?, -?, /?, etc.	Prints help information.

An external directory service may have particular configurations which a directory service must accommodate. In addition to standard settings like name and description, there are the following important categories of options:

- Connection settings: host, port, binding type, username, password
- Schema settings: user and group attribute names used by the external directory service
- Synchronized items: if the entire external directory should not be imported, the items commands should be employed to add specific user groups or LDAP directories to include

The following examples describe a typical set of steps to set up a directory service for the local Active Directory.

- Print the settings of directory service "ad": Server.exe admin /directory-service ad
- Change the name of directory service "ad": Server.exe admin /directory-service ad name "Local Active Directory"
- Dump the settings of directory service "ad" to a file : Server.exe admin /directory-service ad print > ad-settings.txt
- Discover the schema of directory service "ad": Server.exe admin /directory-service ad discover
- Copy/paste the recommended schema from the console to the ad-settings.txt file.
- Print all the groups found in "ad": Server.exe admin /directory-service ad groups
- Specify a user group to be synchronized: Server.exe admin /directory-service ad items add Group "cn=All,dc=acme,dc=com"
- Set all the settings of "ad" from a file : Server.exe admin /directory-service ad set ad-settings.txt

### Server.exe admin /users

Option	Description
print, (none)	Prints the current users and groups.
authentication-type	Creates a new directory service with default settings.
authentication-type (Anonymous Forms)	Changes the current authentication type.
help, h, ?, -?, /?, etc.	Prints help information.

Examples:

- Print information about current users and groups: Server.exe admin /users
- Change the authentication type to "Forms": Server.exe admin /users authentication-type Forms

### Server.exe admin /server

Option	Description
print, (none)	Prints the current primary server settings.
<property>	Prints the current value of <property>.
<property> <value>	Sets the value of <property> to <value>.
help, h, ?, -?, /?, etc.	Prints help information.

Examples:

- Print the current primary server settings: Server.exe admin /server
- Print the current primary server IP address: Server.exe admin /server ip-address
- Set the current primary server web address: Server.exe admin /server web-address https://acme/ZENworks

- Set the SSL certificate file path: `Server.exe admin /server ssl-certificate-file c:\programdata\acme\cert.txt`

### Server.exe admin /sync

Option	Description
print, (none)	Prints the current sync settings.
<property>	Prints the current value of <property>.
<property> <value>	Sets the value of <property> to <value>.
help, h, ?, -?, /?, etc.	Prints help information.

Examples:

- Print the sync settings: `Server.exe admin /sync`
- Print the value of property "storage-path": `Server.exe admin /sync storage-path`
- Set the user quota to 2 GB: `Server.exe admin /sync quota-megabytes 2000`

### Server.exe admin /user-groups

Option	Description
print, (none)	Prints the current list of user groups.
new <name>	Creates a new user group with default settings.
delete <id>	Deletes the given group.
help, h, ?, -?, /?, etc.	Prints help information.

Examples:

- Print the current groups: `Server.exe admin /user-groups`
- Create a new group with name "Power Users": `Server.exe admin /user-groups new "Power Users"`
- Delete group 2: `Server.exe admin /user-groups delete 2`

### Server.exe admin /user-group <id>

Option	Description
print, (none)	Prints the current settings for the user group.
<property>	Prints the current value of <property>.
<property>	Sets the value of <property> to <value>.

<value>	
set [<file>]	Imports settings from a file, or standard input if no file is specified. Settings files are in the same format as the output of the print function.
clear	Removes all members from the group.
help, h, ?, -?, /?, etc.	Prints help information.

Examples:

- Print the settings of group 2: Server.exe admin /user-group 2
- Print the properties and members of group 2: Server.exe admin /user-group 2 print
- Remove all members from group 2: Server.exe admin /user-group 2 clear

## ZENWORKS APPLICATION AUTHORIZATION WEB SERVICE

When integrating with existing permissions systems, ZENworks provides a web service for granting and revoking access to applications. The web service is available as a REST API with the following capabilities:

- View access to an application or category for a user or group
- Grant access to an application or category for a user or group
- Revoke access to an application or category for a user or group

Service Call	REST API
View Application Access	<p><u>HTTP GET</u>  URL: <a href="http://[SERVER]:[PORT]/0.1/lib/app/[APPLICATION]/permissions">http://[SERVER]:[PORT]/0.1/lib/app/[APPLICATION]/permissions</a></p> <p><u>HTTP HEADERS</u>  X-Spoon-User: [ZAV Server Administrator]  X-Spoon-Password: [Password]</p>
View Category Access	<p><u>HTTP GET</u>  URL: <a href="http://[SERVER]:[PORT]/0.1/lib/cat/[CATEGORY]/permissions">http://[SERVER]:[PORT]/0.1/lib/cat/[CATEGORY]/permissions</a></p> <p><u>HTTP HEADERS</u>  X-Spoon-User: [ZAV Server Administrator]  X-Spoon-Password: [Password]</p>
Grant Application Access	<p><u>HTTP POST</u>  URL: <a href="http://[SERVER]:[PORT]/0.1/lib/app/[APPLICATION]/permissions">http://[SERVER]:[PORT]/0.1/lib/app/[APPLICATION]/permissions</a></p> <p><u>HTTP HEADERS</u></p>



	X-Spoon-User: [ZAV Server Administrator] X-Spoon-Password: [Password]  <u>HTTP BODY</u> {"_id":"[LOGIN].[DIRECTORY PREFIX]","permitted":"true"}
Grant Category Access	<u>HTTP POST</u> URL: <a href="http://[SERVER]:[PORT]/0.1/lib/cat/[CATEGORY]/permissions">http://[SERVER]:[PORT]/0.1/lib/cat/[CATEGORY]/permissions</a>  <u>HTTP HEADERS</u> X-Spoon-User: [ZAV Server Administrator] X-Spoon-Password: [Password]  <u>HTTP BODY</u> {"_id":"[LOGIN].[DIRECTORY PREFIX]","permitted":"true"}
Revoke Application Access	<u>HTTP POST</u> URL: <a href="http://[SERVER]:[PORT]/0.1/lib/app/[APPLICATION]/permissions">http://[SERVER]:[PORT]/0.1/lib/app/[APPLICATION]/permissions</a>  <u>HTTP HEADERS</u> X-Spoon-User: [ZAV Server Administrator] X-Spoon-Password: [Password]  <u>HTTP BODY</u> {"_id":"[LOGIN].[DIRECTORY PREFIX]","permitted":"false"}
Revoke Category Access	<u>HTTP POST</u> URL: <a href="http://[SERVER]:[PORT]/0.1/lib/cat/[CATEGORY]/permissions">http://[SERVER]:[PORT]/0.1/lib/cat/[CATEGORY]/permissions</a>  <u>HTTP HEADERS</u> X-Spoon-User: [ZAV Server Administrator] X-Spoon-Password: [Password]  <u>HTTP BODY</u> {"_id":"[LOGIN].[DIRECTORY PREFIX]","permitted":"false"}

Note: [CATEGORY] refers to the **Slug** field in the Category details page on the ZAV Server Administrator portal and [APPLICATION] refers to the **Slug** field on the Application detail.

## ZENWORKS JAVASCRIPT API

When publishing applications to external sites, ZENworks provides a JavaScript API to enable control over the ZENworks Application Virtualization Console installation, launching applications and deploying applications to the desktop. The following table lists and describes the method calls available in the JavaScript API.

Method Call	Description
-------------	-------------

SpoonEntry.RunApp (string ConfigUrl, boolean Register)	<p>Launches an application based on a string which denotes the absolute URL to an application configuration.</p> <p>There is an optional Boolean parameter which indicates whether or not the application should be deployed to the users' desktop.</p> <p>Example configuration URL:</p> <p>http://[SERVER_NAME]/Config/?a=[APPLICATION_NAME]&amp;v=[VERSION_NUMBER]&amp;e=[ENTRY_POINT_NAME]</p>
SpoonApi.IsPluginInstalled ()	<p>Checks whether the ZENworks Application Virtualization Console is installed on the client machine.</p>
SpoonEntry.RedirectToInstaller ()	<p>Prompts user to install the ZENworks Application Virtualization Sandbox Manager.</p>

Use the following code to reference the ZENworks JavaScript API:

```
<script language="javascript" src="http://[Server]/Plugin/Api/" type="text/javascript"></script>
```

**Example:** Create a link which launches 7-Zip.

```
<script language="javascript" src="http://[Server]/Plugin/Api/" type="text/javascript"></script>
```

```
<a href="#" onclick="(new SpoonEntry()).RunApp('http://[Server]/Config/?a=7Zip'); return false;">Launch 7-Zip</a>
```

**Example:** Create a link which launches 7-Zip, registers a Start Menu shortcut and uses a branding URL.

```
<script language="javascript" src="http://[Server]/Plugin/Api/" type="text/javascript"></script>
```

```
<a href="#" onclick="(new SpoonEntry()).RunApp('http://[Server]/Config/?a=7Zip', true, 'http://url.to.branding/graphic.gif'); return false;">Launch 7-Zip</a>
```

**Example:** Create a link which launches Firefox version 5.0.0.0.

```
<script language="javascript" src="http://[Server]/Plugin/Api/" type="text/javascript"></script>
```

```
<a href="#" onclick="(new SpoonEntry()).RunApp('http://[Server]/Config/?a=Firefox5&v=5.0.0.0'); return false;">Launch Firefox</a>
```

**Example:** Prompt the user to install the ZENworks Application Virtualization Console if it is not already installed on the machine.

```
<script language="javascript" src="http://[Server]/Plugin/Api/" type="text/javascript"></script>
```

```
<script language="javascript" type="text/javascript">
  if(!SpoonApi.IsPluginInstalled()) SpoonEntry.RedirectToInstaller()
</script>
```

## ZENWORKS VIRTUAL APPLICATION FEED

The ZENworks Virtual Application Feed provides a separate JavaScript API to embed a button within a webpage. This API enables user control over which application to launch and button appearance. The following table lists and describes the method calls available through the ZENworks Virtual Application Feed:

Parameter Name:	Javascript Type:	Required:	Description:
Spoon_PortalRoot	String	Yes	This is the Portal Site URL
Spoon_Id	String	Yes	This is the Application identifier.
Spoon_BackgroundColor	String	No	This sets the background color for the feed button.

To embed a ZENworks Virtual Application Feed, you must first initialize the ZENworks Variables above to the correct values with javascript:

```
<script type="text/javascript">
Spoon_PortalRoot = 'http://<server name>';
Spoon_Id = '<application slug>-<application major version>.<application minor version>';
</script>
```

After the ZENworks Variables are set, use the following code to embed the ZENworks Virtual Application Feed in an iframe:

```
<script language="javascript" type="text/javascript" src="http://<server name>/Feed/"></script>
```

Example 1: Embed a Button to Launch Firefox 5.0.0.0.

```
<script type="text/javascript">
Spoon_AppName = 'Firefox 5';
Spoon_AppVersion = '5.0.0.0';
</script>

<script language="javascript" type="text/javascript" src="http://[Server]/Feed"></script>
```

## TESTING WITH A SELF-SIGNED CERTIFICATE

ZENworks Virtual Application Server supports both HTTP and HTTPS (SSL). When testing over SSL it is common to use a self-signed certificate, however, this can cause unexpected errors if the certificate is not recognized as a valid certificate on the server and client machines. This section provides information on how to configure the server for SSL and how to add the test certificate to the Windows and the Java JRE certificate stores.

**Note:** Self-signed certificates should not be used in a production environment. For improved security and to avoid authentication errors, only certificates issued by a trusted certificate authority should be used.

Follow these steps to enable SSL for the ZENworks Virtual Application Server:

- Go to the Administrator Portal
- Click on the Servers button at the top
- Click on the Primary server link to go to the server details page
- Set **Web Address** to use **https** instead of **http**

- Set **Administration Site** address to use **https** instead of **http**
- Set the SSL Certificate fields to the path of the *certificate.crt* and *certificate.key* files

On the client machine and the server, follow these steps to add the test certificate to the Windows certificate store:

- Double-click on your *certificate.crt* file to install it in the **Trusted Root Certification Authorities** for Windows

On the client machine and the server, follow these steps to add the test certificate to the Java JRE certificate store:

- Install the latest Java JRE
- Add the *certificate.crt* file to the Java trust store.

**Usage:**

[Path-to-java]\bin\keytool.exe -import -alias [alias] -file [path-to-crt-file] -keystore [path-to-cacerts] -storepass changeit

**Example command-line:**

```
"c:\Program Files (x86)\Java\jre7\bin\keytool.exe" -import -alias VirtualAppServer -file
C:\Users\testuser\Desktop\certificate.crt -keystore "C:\Program Files (x86)\Java\jre7\lib\security\cacerts" -
storepass changeit
```

Verify that the certificate information is correct and confirm

**Trust this certificate? [no]:** yes  
**Certificate was added to keystore**

Copy the Java JRE certificate store file to a temporary location on the local system.

- **Example command-line:** copy "[path to Java install]\jre[X]\lib\security\cacerts" C:\temp

Copy the Java JRE certificate store file to the appropriate virtual application sandboxes.

- ZENworks Application Virtualization Studio:

**Example command-line:**

```
[Path-to-ZAV Studio]\ksync.exe /XShellEx="@SYSWOW64@\cmd.exe"
```

```
copy C:\temp\cacerts [path to Java install]\Java\jre6\lib\security
```

- ZENworks Application Virtualization Server Console:

**Example command-line:**

```
[Path-to-ZAV Server Console]\ksync.exe /XShellEx="@SYSWOW64@\cmd.exe"
```

```
copy C:\temp\cacerts [path to Java install]\Java\jre6\lib\security
```

**Note:** For details on where the ZENworks Application Virtualization Console is installed, refer to *ZENworks Application Virtualization Advance Topics > Install location*.

After completing the steps to install the test certificate on the client and the server, test the desired feature and verify that SSL is being used. Features that would use SSL include:

- **SandboxSync**
- **Publish to ZAV Server** – from ZENworks Application Virtualization Studio

## USING INSTALLED AND REGISTERED VIRTUAL APPLICATIONS TOGETHER

When an application is added to the Start Menu, it should function as if it were natively installed. If it is not working, troubleshooting steps should be taken, such as verifying file associations in the registry.

For example: If you are using local version of Microsoft Office Outlook and a virtual browser, selecting a link in an email should open the link in the virtual browser as long as the file associations in the registry for .htm, .html etc. are set to use the virtual browser. If these are correct, the protocols (http, https) also need to be set to use the correct program. To verify this, complete the following steps:

- First, ensure the application has been added to the Start menu
  - Click on the ZENworks icon in the task bar
  - Click Applications
  - Click the name of the selected application
  - You should see Remove from Start Menu. This means the application has been registered to the desktop.
- Next check the registry keys
  - Open the Start menu
  - In the Search box (Run... on Windows XP), type regedit
  - Search for any of the file extension or protocol values, such as http or.html
  - In the HKEY\_CURRENT\_USER\Software\Classes section of the registry each of the extensions and protocols will be listed.
    - In each item, there will be a registry entry titled (Default). The Data, or value, of the key should reflect the virtual application title. For example, if you are using Firefox as your default, the value would be FirefoxHTML

Note: The value reflects what is called a Program ID. You can find the correct Program ID in the configuration file by searching for the section labeled ProgID.

## TROUBLESHOOTING ZENWORKS APPLICATION VIRTUALIZATION SERVER

This section provides information to help troubleshoot common issues you might encounter while using ZENworks Application Virtualization Server.

### ENABLING DEBUG LOGGING

Complete the following steps to enable logging for ZENworks Application Virtualization Server:

1. Open a Windows Command Prompt as an administrator (cmd.exe).
2. Enter the following command: net stop ZAV.
3. Navigate to “C:\ProgramData\Novell\ZENworks Application Virtualization Server” and open settings.xml with Notepad or another text editor.

4. Add a new element called TraceLevel with value Debug as a child element to Settings; after adding this element the file should resemble the following:

```
<?xml version="1.0" encoding="utf-8"?>
<settings>
<InstallPath>[Path]</InstallPath>
<InstalledVersion>[Version]</InstalledVersion>
<DbLibraryConnection>embedded</DbLibraryConnection>
<DbManagerConnection>embedded</DbManagerConnection>
<TraceLevel>Debug</TraceLevel>
</settings>
```

5. Enter the following command in the Command Prompt: net start ZAV.
6. Upon restarting ZENworks Application Virtualization Server (with the previous command), debug logs are written to a text file located at “C:\Program Files\Novell\ZENworks Application Virtualization Server”. This log file is assigned a name based on the date and time when ZENworks Application Virtualization Server restarted. A new log file is created on subsequent restarts of ZENworks Application Virtualization Server.

## LOCATING LOG FILES

There are several types of logs available for ZENworks Application Virtualization Server, including logs for the installation process, Apache, and SQL Server. The log file locations are dependent on the install location of ZENworks Application Virtualization Server. The default location is “C:\Program Files\Novell\ZENworks Application Virtualization Server”.

### ZENWORKS APPLICATION VIRTUALIZATION SERVER INSTALLATION LOGS

- *<Install Directory>\logs\Setup.log*

### ZENWORKS APPLICATION VIRTUALIZATION SERVER RUNTIME LOGS

- *<Install Directory>\logs\\*.log*
- *<Install Directory>\Sandbox\roaming\modified\@PROGRAMFILESX86@\Novell\ZENworks Application Virtualization Server\Web\logs\\*.log*

### SQL SERVER LOGS (EMBEDDED SQL SERVER EXPRESS)

- *<Install Directory>\Sandbox\roaming\modified\@PROGRAMFILESX86@\Microsoft SQL Server\MSSQL.1\MSSQL\LOG*

### APACHE LOGS

- *<Install Directory>\Sandbox\roaming\modified\@PROGRAMFILESX86\Apache Software Foundation\Apache2.2\logs\error.log*

## WINDOWS EVENT VIEWER

The Windows Event Viewer is another useful source of information. If there is an issue starting the Windows service for ZENworks Application Virtualization Server there may be information reported in the Window Event Viewer to help diagnose the problem.

## COMMON ISSUES

The following table lists common issues/questions and their solutions:

Issue/Question	Solution
There is an error during installation: ZENworks Application Virtualization Server installation failed, please contact the administrator.	This may occur if there is a timeout when starting or accessing the database services. Go to <i>Control Panel &gt; Administrative Tools &gt; Services</i> and try restarting the ZENworks Application Virtualization Server Service.
The ZENworks Application Virtualization Service fails to start.	This may occur if there is a timeout when starting or accessing the database services. Go to <i>Control Panel &gt; Administrative Tools &gt; Services</i> and try restarting the ZENworks Application Virtualization Server Service.
How do I restart the ZENworks Application Virtualization Server from the command-line?	This is the same process as restarting any Windows service. Run a command window as Administrator and use the following commands.  <i>net stop ZAV</i>  Wait for the process to complete. If there are errors, refer to the logs.  <i>net start ZAV</i>  Wait for the process to complete. If there are errors, refer to the logs.
I am unable to access the Administration Site or Portal Site from another machine.	Microsoft Windows security settings might be restricting external connections to the ports assigned to the Administration and/or Portal sites. For information about configuring ZENworks Application Virtualization Server security settings, refer to Configuring ZENworks Application Virtualization Server Security.
My application does not appear on the Portal Site.	Verify that the application has a published application version. Application versions are not published by default. For more information about publishing application versions, refer to Managing Applications. Check the application details page to ensure

	that the application is not blocked to users.
My application will not launch from my external portal site.	<p>You may see the following warning message: <a href="#">The application is not available from this web site</a>. If this site is hosted on external server, verify that the server is added to the Servers page on the Administration Site. For more information about adding servers refer to Managing Servers. After adding a new server, verify that you are accessing the site with the specified server web address. If the application still does not launch ZENworks Application Virtualization Server might be unable to resolve the host name for the external server. To make the host name fully resolvable, add an entry to the hosts file on the machine hosting ZENworks Application Virtualization Server. The host file can be found at C:\Windows\System32\drivers\etc\hosts, and should be in the format:</p> <p>[server IP address] [server host name]</p> <p>If the application still does not launch, verify that the security settings for ZENworks Application Virtualization Server are correctly configured. Improper security settings can restrict access to the ZENworks JavaScript API. For more information about how to configure security settings, refer to Configuring ZENworks Application Virtualization Server Security.</p>
My application runs when I access Portal Site using the machine name, but not when I use the fully qualified domain name.	<p>You may see the following warning message: <a href="#">The application is not available from this web site</a>. On the Servers page of the Administration Site, select the Primary server and change the Web Address to the fully qualified domain name. It can take up to one minute for the change to take effect. Verify that the domain name is included in the list of allowed portals for your license; this can be verified in the License section on the Admin page.</p>
Where do I install a new license?	<p>New licenses can be applied by clicking the New License link found on the Admin page in the Administration Site.</p>
I am unable to optimize an application version.	<p>After attempting to update a model, you might see the model status change to: <a href="#">Error: The layer is compressed</a>. This error message indicates that the SVM was built with the Compress Payload option set, prohibiting optimization. Rebuilding SVM without this option set.</p>
The ZENworks Application Virtualization Server is no longer accessible after making a Network configuration change.	<p>The ZENworks Application Virtualization Server service may need to be restarted after making a Network configuration change.</p>
The Admin Site and Portal Site do not display or function properly on	<p>Compatibility mode is enabled by default for intranet sites and must be disabled for the Admin Site and Portal Site. This setting can be disabled under <i>Tools &gt; Compatibility Settings</i>.</p>



Internet Explorer.	
The Portal Site fails to load.	<p>This may be due to an out of memory error in the Java runtime. To verify this, look for the following error in the Jetty logs (location specified below) on the ZAV Server.</p> <p><i>java.lang.OutOfMemoryError: Java heap space</i></p> <p>To increase the memory available, add a new parameter to the <i>Settings.xml</i> file located in C:\ProgramData\Novell\ZENworks Application Virtualization Server.</p> <pre>&lt;Settings&gt; ... &lt;PortalJavaParams&gt;-Xmx1200M&lt;/PortalJavaParams&gt; ... &lt;/Settings&gt;</pre> <p>This sets the maximum heap size for the Java process.</p>
Where is the installation log for ZENworks Application Virtualization Server?	<Install Directory>\logs\Setup.log
Where are the ZENworks Application Virtualization Server runtime logs?	<pre>&lt;Install Directory&gt;\logs\*.log</pre> <p><i>and</i></p> <pre>&lt;Install Directory&gt;\Sandbox\roaming\modified\@PROGRAMFILESX86@\Novell\ZENworks Application Virtualization Server\Web\logs\*.log</pre> <p><i>and</i></p> <pre>&lt;Install Directory&gt;\Sandbox\roaming\modified\@PROGRAMFILESX86@\Novell\ZENworks Application Virtualization Server\jetty\logs\*.txt</pre>
Where are the Apache logs?	<Install Directory>\Sandbox\roaming\modified\@PROGRAMFILESX86@\Apache Software Foundation\Apache2.2\logs\error.log
Where are the embedded SQL Server logs?	<Install Directory>\Sandbox\roaming\modified\@PROGRAMFILESX86@\Microsoft SQL Server\MSSQL.1\MSSQL\LOG

## ZENworks Application Virtualization Console

In the following pages you will learn about how to use ZENworks Application Virtualization Console and the ZENworks Application Virtualization Console.

## ZENWORKS APPLICATION VIRTUALIZATION CONSOLE SUPPORTED PLATFORMS

The ZENworks Application Virtualization Console requires a Windows OS and works with most popular Internet browsers, including Microsoft Internet Explorer, Firefox, Safari, Google Chrome, Opera, and any other Gecko API based browsers.

## INSTALLING THE ZENWORKS APPLICATION VIRTUALIZATION CONSOLE

End-users must download and install the ZENworks Application Virtualization Console prior to launching ZENworks applications for the first time.

To install the ZENworks Application Virtualization Sandbox Manager, click on an application available in the ZENworks Application Virtualization Server user portal. A window will open indicating the plugin is not installed. Select OK to download and install the ZENworks Application Virtualization Sandbox Manager. Select Run, or Save the executable to your computer and then run it to launch the ZENworks Application Virtualization Console installer.

If you already have the ZENworks Application Virtualization Console and are installing an update ZENworks automatically uninstalls older versions if they have been idle for more than 30 days. If there are multiple instances of the Sandbox Manager, you can manually uninstall older versions of the plugin from Add/Remove Programs (Windows XP) or Programs and Features from the Control Panel.

After the ZENworks Application Virtualization Console is installed complete the following steps to launch an application:

1. Select any application and it will begin streaming to your desktop. Once the application buffers it launches automatically.
2. After you finish using the application close it as you would a natively installed application.

The ZENworks Application Virtualization Console will continue to run in the background to optimize the launch of ZENworks applications. The Spoon-Sandbox.exe process manages the sandboxes of any running virtual applications launched with the plugin. If that process closes, all ZENworks applications will also close.

## COMMAND LINE FLAGS

When installing the ZENworks Application Virtualization Console for a managed environment, there are command line flags that may be useful.

ZENworks-plugin.exe [Option]

Parameter	Behavior
/Silent	Installs the ZENworks Application Virtualization Console silently.

/AllUsers	Installs the ZENworks Application Virtualization Console under the All Users profile, so it is available to all profiles on the machine. This is only available if the running user has administrator rights on the machine.
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## PROXY SETTINGS

The ZENworks Application Virtualization Console uses the proxy settings of the local device by default. End-users using Microsoft Internet Explorer can change proxy settings from within the browser. Users of other browsers must change proxy settings on the host device itself.

Complete the following steps to change system proxy settings on the host device:

- Navigate to the Control Panel in your windows Start Menu.
- Select the Internet Options icon.
- Select the Connections tab, then LAN Settings.
- Enter the proxy settings specified by your network administrator.

## USING THE ZENWORKS APPLICATION VIRTUALIZATION CONSOLE

The ZENworks Application Virtualization Console is what end-users see when they select the ZENworks icon from the system tray. From here users can log in or out of accounts, register applications to the desktop, and shut-down the plugin. Note the following ZENworks Application Virtualization Console features:

- ZENworks Application Virtualization Console automatically runs on Microsoft Windows startup and runs in the background until manually shut-down. The process is represented in the Microsoft Windows systray by a ZENworks icon. Select the icon brings up a more detailed window from which all other settings are available. Closing this window does not end the background activity; only choosing Shut Down from the Options menu shuts down background activity.
- To restart a shut-down ZENworks Application Virtualization Console, select Start > All Programs > Startup > ZENworks Application Virtualization Sandbox Manager, and then the most recent version. Launching an application from a ZENworks host via a web browser restarts the ZENworks Application Virtualization Console.
- To be "signed in" means that applications will run without prompting for a username and a password, application settings data are saved, and settings for that user can be viewed and edited.
- Multiple ZENworks users can be signed in on the same machine.
- Only one ZENworks user per host can be signed in at the same time.
- Connecting the local device enables it to be seen by ZENworks Application Virtualization Consoles on other machines signed in to the same ZENworks account. Disconnecting it removes it from view.

## ZENWORKS APPLICATION VIRTUALIZATION CONSOLE OVERVIEW

### STATUS

The status bar shows whether a user is signed in, when ZENworks is synchronizing data, or if the Plugin is running Idle in the background the user's usage data. Users must be signed in to view status. As you navigate through the options in the console, the status section will show you a selectable list, or breadcrumb, listing to your location in the console.

## MAIN ZENWORKS APPLICATION VIRTUALIZATION CONSOLE

The ZENworks Application Virtualization Console contains links where users can access their Applications.

Users can click on Applications to open the Application list. Users can click on the application name to open a new menu that allows them to launch the application as well as add or remove the applications from the start menu. Users can return to the main console menu by clicking the Home link at the top of the console.

When launching an application hosted on ZENworks Application Virtualization Server that has been added to the start menu, the ZENworks Application Virtualization Console will check to see if there is a new version available. If a new version is available, the user will be prompted for which version they would like to start.

## ZENWORKS APPLICATION VIRTUALIZATION CONSOLE ADVANCED TOPICS

This section describes advanced features of the ZENworks Application Virtualization Sandbox Manager.

### INSTALL LOCATION

If the ZENworks Application Virtualization Console was installed for all users, the install location is in one of the following locations.

For x86 platforms: "C:\Program Files\Spoon"

For x64 platforms: "C:\Program Files (x86)\Spoon"

If the plugin is installed for a single user profile, the install location is in one of the following locations.

For Windows XP: C:\Documents and Settings\

For Windows Vista or newer: C:\Users\

### COMMAND LINE FLAGS

The ZENworks Application Virtualization Console installs an application called ZENworks Application Virtualization Console that runs on startup. This application can be found in the install directory of the ZENworks Application Virtualization Sandbox Manager. There is a command line interface for this application.

Spoon-Sandbox.exe [Option]

Parameter	Behavior
/uninstall	Uninstalls the ZENworks Application Virtualization Sandbox Manager. Close all web browsers before

	uninstalling.
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## XLAUNCH

XLaunch is an internal application used to execute virtual applications that have been registered to the desktop by SpoonReg or through the ZENworks Application Virtualization Console.

### INSTALL LOCATION

Location when installed by SpoonReg: @APPDATALOCAL@\Spoon\XLaunch\\XLaunch.exe

Location when installed by ZENworks Application Virtualization Sandbox Manager:

@APPDATALOCAL\ZENworks\Client\Components\\XLaunch.exe

### COMMAND LINE REFERENCE

*XLaunch.exe* <Path to default.xclient> <RegistrationId> [<Shell Execute Info>/XUninstall/XUninstallQuiet]

Option	Description
Path to default.xclient	This is the path to the xclient file where the app was registered.
RegistrationId	This is the uniquely identifying guid of the virtual application specified on the SpoonReg.exe command line using the /id parameter.
Shell Execute Info: <verb> <path> [<additional parameters>]	verb: the verb used to shell execute the application or document, e.g. <a href="#">open</a> , <a href="#">edit</a> , <a href="#">print</a> path: the path to the application or document to execute, may be use path variables (like @PROGRAMFILES@) or not. additional parameters: any additional parameters to pass to the application being executed.
/XUninstall	Uninstalls the application and informs the user when the uninstall is complete
/XUninstallQuiet	Uninstalls the application with no user feedback

## XCLIENT FILE

The XClient file is an XML file that provides information about applications that are registered to the user's machine. Registering and applications can be done using the SpoonReg command line tool (Register Virtual Applications in the Windows Shell), through the ZENworks Application Virtualization Console by clicking "Add to Start Menu" (*Using the ZENworks Application Virtualization Console*), or through the ZENworks JavaScript API.

### FILE LOCATION

Applications registered with SpoonReg: @APPDATALOCAL@\Spoon\Client\5\Default.xclient  
 Applications registered from ZENworks Virtual Application Server:  
 @APPDATALOCAL@\Spoon\Servers\

## XML FILE FORMAT

Element	Description
ConfigReferences	List of all external configurations from which this configuration inherits
KnownServers	<p>List of any portals the ZENworks Client has logged into. Also contains a recentServer element that lists the last portal the console was logged in to. The sub elements for each Server are:</p> <ul style="list-style-type: none"> <li>• name - Name of the portal</li> <li>• portalUrl - Address of the portal</li> <li>• portalSecureUrl - Address of the portal if SSL is enabled</li> <li>• syncUrl - Address of the synchronization service</li> </ul>
Sandboxes	Every time an application is launched, a sandbox is created. This element lists the location of each sandbox for the user account.
SyncSettings	<p>Contains the settings used by the synchronization service. Sub-elements of SyncSettings are:</p> <ul style="list-style-type: none"> <li>• BandwidthManager - Controls the Upload Throttling feature of the console</li> <li>• SyncUser - Contains the name, server, and url of the primary user's Synchronization service</li> </ul>

## TROUBLESHOOTING ZENWORKS APPLICATION VIRTUALIZATION CONSOLE

This section describes how to troubleshoot issues on the client machine when attempting to run applications from the ZENworks Application Virtualization Server. Possible problems include issues with connectivity, streaming, user authentication and application launch failures.

### ENABLING DEBUG LOGGING

Complete the following steps to enable diagnostic mode and capture debug output logs for the ZENworks Application Virtualization Sandbox Manager:

1. Download and run the DebugView application from: <http://technet.microsoft.com/en-us/sysinternals/bb896647.aspx>
2. Run Regedit.exe, the Microsoft Windows default registry editor tool.
3. Add the following String value to the registry key: "HKEY\_CURRENT\_USER\Software\Code Systems\Spoon" with the name set to TraceLevel, and the value set to "Debug".

4. Restart the ZENworks Application Virtualization Console by selecting Start > All Programs > Startup > ZENworks Application Virtualization Sandbox Manager. If multiple versions of the ZENworks Application Virtualization Console exist, restart each.
5. When the application is launched again with ZENworks, the DbgView Output displays debugging logs.

## COMMON ISSUES

The following table lists common issues/questions and their solutions:

Question	Answer
What is the ZENworks Application Virtualization Sandbox Manager?	The ZENworks Application Virtualization Console is an extension to your browser that lets you run applications from ZENworks Application Virtualization Servers.
How do I add the ZENworks Application Virtualization Sandbox Manager?	To add the ZENworks Application Virtualization Sandbox Manager, select OK when prompted to add the plugin. Your browser will ask you to Run or Save the executable. Select Run when possible, otherwise save the file to your computer and then double-click it to launch the ZENworks Application Virtualization Console setup. When the plugin setup is complete you are ready to enjoy your application!
How do I uninstall the ZENworks Application Virtualization Sandbox Manager?	To remove the ZENworks Application Virtualization Sandbox Manager, go to the Control Panel, select Add/Remove Programs or Uninstall a Program, and then select ZENworks Application Virtualization Sandbox Manager.
How does ZENworks Application Virtualization work?	Applications delivered by ZENworks Application Virtualization Server leverage your operating system and resources on your system. Unlike other cloud solutions, the applications run on your system to enable the same performance as if the other cloud solutions, the applications run on your system to enable the same performance as if the application were installed. You can also access your local resources, such as printers and network folders. This enables ZENworks Application Virtualization Server to work well over wide-area networks with lower bandwidth connections.
I'm unable to add an application to the Start Menu.	Verify that <b>Desktop Registration</b> is enabled in the ZENworks Application Virtualization Server Administrator Site.  Verify that the user is logging into the ZENworks Application Virtualization Console with the exact server name that is specified under Servers in the Administrator Site.
The ZENworks Application Virtualization Server Portal Site is not supported by my browser.	The Portal Site supports all major browsers except Internet Explorer versions earlier than Internet Explorer 8. If you are accessing the Portal Site with a newer version of Internet Explorer, but experiencing problems, be sure to disable compatibility mode. This feature is enabled automatically for intranet sites and

	emulated Internet Explorer 7 which is not supported by the Portal Site.
I click on an application Launch button, and nothing happens?	<p>There are two possible reasons for this. First, the ZENworks Application Virtualization Console may not be installed. Verify your browser will allow pop-up windows and then click the application again. A window will pop up asking your permission to install the plugin. Second, for users not on a corporate network it may be necessary to ensure that Windows Firewall is configured to allow an exception for ZENworks Application Virtualization Console so the program can access the ZENworks Application Virtualization Server. To add an exception to Windows Firewall (Windows Vista and Windows 7):</p> <ol style="list-style-type: none"> <li>a. Open the Control Panel.</li> <li>b. Select Windows Firewall.</li> <li>c. Click the All a program or feature through Windows Firewall link.</li> <li>d. In the popup window, find ZENworks Application Virtualization Console and ensure the proper boxes are checked. <ol style="list-style-type: none"> <li>i. If you do not see the ZENworks Application Virtualization Console listed, click the Allow another program button and browse to the location where the ZENworks Application Virtualization Console is located. An example is "<a href="#">C:\Program Files\Spoon\[version number]\Spoon-Sandbox.exe</a>".</li> </ol> </li> <li>e. Click OK and close the window.</li> </ol> <p>If you are running a third-party antivirus or security software, and exception may need to be added to those programs as well. This process varies for each application. Please consult the software manufacturer for details on the exception process.</p>

## Thank you for using ZENworks Application Virtualization Server!

We hope you enjoy using ZENworks Application Virtualization Server. Please let us know any way we can improve your Novell experience.

*- The Novell Team*