NetApp

Install and configure

e-series

NetApp
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Review installation and upgrade requirements

Before installing the Web Services Proxy, review the installation requirements and upgrade considerations.

Installation requirements

You can install and configure the Web Services Proxy on a Windows or Linux host system.

Proxy installation includes the following requirements.

Requirement	Description
Hostname limitations	Be sure that the hostname of the server where you plan to install the Web Services Proxy contains only ASCII letters, numerical digits, and hyphens (-). This requirement is due to a limitation of Java Keytool, which is used in generating a self-signed certificate for the server. If the hostname of your server contains any other characters, such as an underscore (_), the Webserver will fail to start after installation.
Operating systems	You can install the proxy on the following operating systems: • Linux • Windows For a complete list of operating systems and firmware compatibility, see the NetApp Interoperability Matrix Tool.
Linux: Additional Considerations	Linux Standard Base libraries (init-functions) are required for the Webserver to function properly. You must install the lsb/insserv packages for your operating system. For more information, refer to the "Additional packages required" section of the Readme file.
Multiple instances	You can install only one instance of Web Services Proxy on a server; however, you can install the proxy on multiple servers within your network.

Requirement	Description
Capacity planning	Web Services Proxy requires adequate space for logging. Make sure that your system meets the following available disk space requirements: • Required installation space — 275 MB • Minimum logging space — 200 MB • System memory — 2 GB; heap space is 1 Gb by default You can use a disk-space monitoring tool to verify available disk drive space for persistent storage and logging.
License	The Web Services Proxy is a free, standalone product that does not require a license key. However, applicable copyrights and terms of service apply. If you are installing the proxy in either Graphical or Console mode, you must accept the End User License Agreement (EULA).

Upgrade considerations

If you are upgrading from a previous version, be aware that some items are preserved or removed.

- For the Web Services Proxy, previous configuration settings are preserved. These settings include user passwords, all discovered storage systems, server certificates, trusted certificates, and server runtime configuration.
- For Unified Manager, all SANtricity OS files previously loaded in the repository are removed during the upgrade.

Download and install Web Services Proxy file

Installation involves downloading the file and then installing the proxy package on a Linux or Windows server.

Download Web Services Proxy files

You can download the installation file and the readme file from the Software download page of the NetApp Support site.

The download package includes the Web Services Proxy and the Unified Manager interface.

Steps

1. Go to NetApp Support - Downloads.
2. Select **E-Series SANtricity Web Services Proxy**.
3. Follow the instructions to download the file. Make sure you select the correct download package for your server (for example, EXE for Windows; BIN or RPM for Linux).

4. Download the installation file to the server where you want to install the proxy and Unified Manager.

Install on Windows or Linux server

You can install the Web Services Proxy and Unified Manager using one of three modes (Graphical, Console, or Silent), or by using an RPM file (Linux only).

Before you begin

- Review installation requirements.

- Make sure you have downloaded the correct installation file (EXE for Windows; BIN for Linux) to the server where you want to install the proxy and Unified Manager.

Graphical mode install

You can run the installation in Graphical mode for either Windows or Linux. In Graphical mode, the prompts appear in a Windows-style interface.

Steps

1. Access the folder where you downloaded the installation file.

2. Launch the installation for either Windows or Linux, as follows:

   - Windows — Double-click the installation file:

     ```
     santricity_webservices-windows_x64-nn.nn.nn.nnnn.exe
     ```

   - Linux — Run the following command: `santricity_webservices-linux_x64-nn.nn.nn.nnnn.bin`

     In the above filenames, `nn.nn.nn.nnnn` represents the version number.

   The installation process starts and the NetApp SANtricity Web Services Proxy + Unified Manager splash screen appears.

3. Follow the on-screen prompts.

   During the installation, you are prompted to enable several features and enter some configuration parameters. If necessary, you can change any of these selections later in the configuration files.

4. When the Webserver Started message appears, click **OK** to complete the installation.

   The Install Complete dialog box appears.

5. Click the check boxes if you want to launch Unified Manager or the interactive API documentation, and then click **Done**.

Console mode install

You can run the installation in Console mode for either Windows or Linux. In Console mode, the prompts appear in the terminal window.

Steps

1. Run the following command: `<install filename> -i console`

In the above command, `<install filename>` represents the name of the proxy installation file you downloaded (for example: `santricity_webservices-windows_x64-nn.nn.nn.nnnn.exe`).

> ⓘ To cancel the installation at any time during the installation process, type `QUIT` at the command prompt.

The installation process starts and the Launching Installer — Introduction message appears.

2. Follow the on-screen prompts.

During the installation, you are prompted to enable several features and enter some configuration parameters. If necessary, you can change any of these selections later in the configuration files.

3. When the installation is complete, press **Enter** to exit the installer.

Silent mode install

You can run the installation in Silent mode for either Windows or Linux. In Silent mode, no return messages or scripts appear in the terminal window.

Steps

1. Run the following command: `<install filename> -i silent`

In the above command, `<install filename>` represents the name of the proxy installation file you downloaded (for example: `santricity_webservices-windows_x64-nn.nn.nn.nnnn.exe`).

2. Press **Enter**.

The installation process can take several minutes to complete. After successful installation, a command prompt appears in the terminal window.

RPM command install (Linux only)

For Linux systems that are compatible with the RPM package management system, you can install the Web Services Proxy using an optional RPM file.

Steps

1. Download the RPM file to the server where you want to install the proxy and Unified Manager.
2. Open a terminal window.
3. Enter the following command:

`rpm -u santricity_webservices-nn.nn.nn.nnnn-n.x86_64.rpm`

> ⓘ In the above command, `nn.nn.nn.nnnn` represents the version number.

The installation process can take several minutes to complete. After successful installation, a command prompt appears in the terminal window.

Log in to API and Unified Manager

Web Services includes API documentation, which enables you to directly interact with the REST API. It also includes Unified Manager, a browser-based interface for managing multiple E-Series storage systems.

Log in to Web Services API

After you install the Web Services Proxy, you can access the interactive API documentation in a browser.

The API documentation runs with each instance of Web Services, and is also available in a static PDF format from the NetApp Support site. To access the interactive version, you open a browser and enter the URL pointing to where Web Services resides (either a controller for the embedded version or a server for the proxy).

> (i) The Web Services API implements the OpenAPI specification (originally called the Swagger specification).

For initial login, you use the "admin" credentials. "Admin" is considered a super administrator with access to all functions and roles.

Steps

1. Open a browser.
2. Enter the URL for the embedded or proxy implementation:

   ◦ Embedded: `https://<controller>:<port>/devmgr/docs/`

     In this URL, `<controller>` is the IP address or FQDN of the controller, and `<port>` is the management port number of the controller (defaults to 8443).

   ◦ Proxy: `http[s]://<server>:<port>/devmgr/docs/`

     In this URL, `<server>` is the IP address or FQDN of the server where the proxy is installed, and `<port>` is the listening port number (defaults to 8080 for HTTP or 8443 for HTTPS).

     > (i) If the listening port is already in use, the proxy detects the conflict and prompts you to choose a different listening port.

     The API documentation opens in the browser.

3. When the interactive API documentation opens, go to the drop-down menu in the upper right of the page and select **utils**.
4. Click the **Login** category to see the available endpoints.
5. Click the **POST: /login** endpoint, and then click **Try it out**.
6. For first-time login, enter admin for the username and password.
7. Click **Execute**.
8. To access the endpoints for storage management, go to the drop-down menu in the upper right and select **v2**.

   The high-level categories for endpoints are displayed. You can navigate the API documentation as described in the table.

Area	Description
Drop-down menu	At the upper right of the page, a drop-down menu provides options for switching between version 2 of the API documentation (V2), the SYMbol interface (SYMbol V2), and API utilities (utils) for logging in. (i) Because version 1 of the API documentation was a prerelease and not generally available, V1 is not included in the drop-down menu.
Categories	The API documentation is organized by high-level categories (for example: Administration, Configuration). Click on a category to see the related endpoints.
Endpoints	Select an endpoint to see its URL paths, required parameters, response bodies, and status codes that the URLs are likely to return.
Try It Out	Interact with the endpoint directly by clicking **Try It Out**. This button is provided in each of the expanded views for endpoints. When you click the button, fields appear for entering parameters (if applicable). You can then enter values and click **Execute**. The interactive documentation uses JavaScript to make the request directly to the API; it is not a test request.

Log in to Unified Manager

After you install the Web Services Proxy, you can access Unified Manager to manage multiple storage systems in a web-based interface.

To access Unified Manager, you open a browser and enter the URL pointing to where the proxy is installed. The following browsers and versions are supported.

Browser	Minimum version
Google Chrome	79
Microsoft Internet Explorer	11
Microsoft Edge	79

Browser	Minimum version
Mozilla Firefox	70
Safari	12

Steps

1. Open a browser and enter the following URL:

   ```
   http[s]://<server>:<port>/um
   ```

   In this URL, `<server>` represents the IP address or FQDN of the server where the Web Services Proxy is installed, and `<port>` represents the listening port number (defaults to 8080 for HTTP or 8443 for HTTPS).

   The Unified Manager login page opens.

2. For first-time login, enter `admin` for the user name, and then set and confirm a password for the admin user.

   The password can include up to 30 characters. For further information about users and passwords, see the Access Management section of the Unified Manager online help.

Configure Web Services Proxy

You can modify the Web Services Proxy settings to meet the unique operating and performance requirements for your environment.

Stop or restart the Webserver

The Webserver service is started during installation and runs in the background. During some configuration tasks, you might need to stop or restart the Webserver service.

Steps

1. Do one of the following:

   ◦ For Windows, go to the **Start** menu, select **Administrative Tools › Services**, locate **NetApp SANtricity Web Services** and then select either **Stop** or **Restart**.

   ◦ For Linux, choose the method of stopping and restarting the Webserver for your operating system version. During the installation, a popup dialog indicated what daemon started. For example:

   ```
   web_services_proxy webserver installed and started. You can interact with it
   using systemctl start|stop|restart|status web_services_proxy.service
   ```

   The most common method for interacting with the service is by using `systemctl` commands.

Resolve port conflicts

If the Web Services Proxy is running while another application is available at the defined address or port, you can resolve the port conflict in the wsconfig.xml file.

Steps

1. Open the wsconfig.xml file, located at:

   ◦ (Windows) — C:\Program Files\NetApp\SANtricity Web Services Proxy

   ◦ (Linux) — /opt/netapp/santricity_web_services_proxy

2. Add the following line to the wsconfig.xml file, in which *n* is the port number:

```
<sslport clientauth="request">*n*</sslport>
<port>n</port>
```

The following table shows the attributes that control HTTP ports and HTTPS ports.

Name	Description	Parent Node	Attributes	Required
config	The root node for the config	Null	Version - The version of the config schema is currently 1.0.	Yes
sslport	The TCP port to listen for SSL requests. Defaults to 8443.	config	Clientauth	No
port	The TCP port to listen for HTTP request, defaults to 8080.	config	-	No

3. Save and close the file.

4. Restart the Webserver service so the change takes effect.

Configure load-balancing and/or high-availability

To use the Web Services Proxy in a highly-available (HA) configuration, you can configure load balancing. In an HA configuration, typically either a single node receives all requests while the others are on stand-by, or requests are load-balanced across all nodes.

The Web Services Proxy can exist in a highly-available (HA) environment, with most APIs operating correctly regardless of the recipient of the request. Metadata tags and folders are two exceptions, because tags and folders are stored in a local database and are not shared between Web Services Proxy instances.

However, there are some known timing issues that occur in a small percentage of requests. Specifically, one instance of the proxy can have newer data faster than a second instance for a small window. The Web Services Proxy includes a special configuration that removes this timing issue. This option is not enabled by default, because it increases the amount of time it takes to service requests (for data consistency). To enable this option, you must add a property to an .INI file (for Windows) or an .SH file (for Linux).

Steps

1. Do one of the following:
   - Windows: Open the appserver64.ini file, and then add the `Dload-balance.enabled=true` property.

     For example: `vmarg.7=-Dload-balance.enabled=true`

   - Linux: Open the webserver.sh file, and then add the `Dload-balance.enabled=true` property.

     For example: `DEBUG_START_OPTIONS="-Dload-balance.enabled=true"`

2. Save your changes.
3. Restart the Webserver service so the change takes effect.

Disable SYMbol HTTPS

You can disable SYMbol commands (default setting) and send commands over a remote procedure call (RPC). This setting can be changed in the wsconfig.xml file.

By default, the Web Services Proxy sends SYMbol commands over HTTPS for all E2800 series and E5700 series storage systems running SANtricity OS versions 08.40 or later. SYMbol commands sent over HTTPS are authenticated to the storage system. If needed, you can disable HTTPS SYMbol support and send commands over RPC. Whenever SYMbol over RPC is configured, all passive commands to the storage system are enabled without authentication.

> ⓘ When SYMbol over RPC is used, the Web Services Proxy cannot connect to systems with the SYMbol management port disabled.

Steps

1. Open the wsconfig.xml file, located at:
   - (Windows) — C:\Program Files\NetApp\SANtricity Web Services Proxy
   - (Linux) — /opt/netapp/santricity_web_services_proxy
2. In the `devicemgt.symbolclientstrategy` entry, replace the `httpsPreferred` value with `rpcOnly`.

   For example:

   `<env key="devicemgt.symbolclientstrategy">rpcOnly</env>`

3. Save the file.

Configure cross-origin resource sharing

You can configure cross-origin resource sharing (CORS), which is a mechanism that uses additional HTTP headers to provide a web application running at one origin to have permission to access selected resources from a server at a different origin.

CORS is handled by the cors.cfg file located in the working directory. The CORS configuration is open by default, so cross domain access is not restricted.

If no configuration file is present, CORS is open. But if the cors.cfg file is present, then it is used. If the cors.cfg file is empty, you cannot make a CORS request.

Steps

1. Open the cors.cfg file, which is located in the working directory.

2. Add the desired lines to the file.

   Each line in the CORS configuration file is a regular expression pattern to match. The origin header must match a line in the cors.cfg file. If any line pattern matches the origin header, the request is allowed. The complete origin is compared, not just the host element.

3. Save the file.

Requests are matched on the host and according to protocol, such as the following:

- Match localhost with any protocol — `*localhost*`
- Match localhost for HTTPS only — `https://localhost*`

Uninstall Web Services Proxy

To remove the Web Services Proxy and Unified Manager, you can use any mode (Graphical, Console, Silent, or RPM file), regardless of what method you used to install the proxy.

Graphical mode uninstall

You can run the uninstall in Graphical mode for either Windows or Linux. In Graphical mode, the prompts appear in a Windows-style interface.

Steps

1. Launch the uninstall for either Windows or Linux, as follows:

   ◦ Windows — Go to the directory that contains the uninstall_web_services_proxy uninstall file. The default directory is at the following location: C:/Program Files/NetApp/SANtricity Web Services Proxy/. Double-click `uninstall_web_services_proxy.exe`.

   > ⓘ Alternatively, you can go to **Control Panel › Programs › Uninstall a program**, and then select "NetApp SANtricity Web Services Proxy."

   ◦ Linux — Go to the directory that contains the Web Services Proxy uninstall file. The default directory is at the following location:
   `/opt/netapp/santricity_web_services_proxy/uninstall_web_services_proxy`

2. Run the following command:

   `uninstall_web_services_proxy -i gui`

   The SANtricity Web Services Proxy splash screen appears.

3. From the Uninstall dialog box, click **Uninstall**.

   The Uninstaller progress bar appears and shows the progress.

4. When the Uninstall Complete message appears, click **Done**.

Console mode uninstall

You can run the uninstall in Console mode for either Windows or Linux. In Console mode, the prompts appear in the terminal window.

Steps

1. Go to the uninstall_web_services_proxy directory.

2. Run the following command:

```
uninstall_web_services_proxy -i console
```

The uninstall process starts.

3. When the uninstall is complete, press **Enter** to exit the installer.

Silent mode uninstall

You can run the uninstall in Silent mode for either Windows or Linux. In Silent mode, no return messages or scripts appear in the terminal window.

Steps

1. Go to the uninstall_web_services_proxy directory.

2. Run the following command:

```
uninstall_web_services_proxy -i silent
```

The uninstall process runs, but no return messages or scripts appear in the terminal window. After Web Services Proxy is successfully uninstalled, a command prompt appears in the terminal window.

RPM command uninstall (Linux only)

You can use an RPM command to uninstall the Web Services Proxy from a Linux system.

Steps

1. Open a terminal window.

2. Enter the following command line:

```
rpm -e santricity_webservices
```

> ⓘ The uninstall process might leave files that were not part of the original installation. Manually delete these files to remove Web Services Proxy completely.