

Quest® NetVault® Backup Plug-in *for NDMP*
12.2

**Application Notes for EMC Unified
VNX/VNXe Series and legacy EMC
Celerra platforms**



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Quest Software Inc.
Attn: LEGAL Dept.
4 Polaris Way
Aliso Viejo, CA 92656

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Legend

-  **WARNING:** A WARNING icon indicates a potential for property damage, personal injury, or death.

-  **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

-  **IMPORTANT NOTE, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

NetVault Backup Plug-in for NDMP Application Notes for EMC Unified VNX/VNXe Series and legacy EMC Celerra platforms
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Introduction

- [About this document](#)
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About this document

This document provides information about using the Quest® NetVault® Backup Plug-in *for NDMP* (Plug-in *for NDMP*) with an EMC Celerra or VNX Storage System. It is intended as a supplement to the *Quest NetVault Backup Plug-in for NDMP User's Guide*, which describes the common procedures for installing and configuring the plug-in.

Target audience

This document is intended for system administrators and others responsible for installing, configuring, and using the Plug-in *for NDMP*. An understanding of filer administration and the host platform is assumed.

Recommended additional reading

- NetVault Backup documentation
 - *Quest NetVault Backup Installation Guide*: This guide provides details on installing the NetVault Backup Server and Client software.
 - *Quest NetVault Backup Administrator's Guide*: This guide explains how to use NetVault Backup and describes the functionality common to all plug-ins.
 - *Quest NetVault Backup CLI Reference Guide*: This guide provides a description of the command-line utilities.
 - *Quest NetVault Backup Plug-in for NDMP User's Guide*: This guide describes the procedures for installing and configuring the Plug-in *for NDMP*.

You can download these guides from <https://support.quest.com/technical-documents>.

- Administrator's guide for your Network Data Management Protocol (NDMP)-based network-attached storage (NAS) appliance

Installation and configuration prerequisites

- [Installation prerequisites](#)
- [Configuration prerequisites](#)

Installation prerequisites

In addition to the installation prerequisites covered in the *Quest NetVault Backup Plug-in for NDMP User's Guide*, verify that the following requirements are met:

- **Hardware requirements:** For information about Hitachi NAS (HNAS) Servers, see the Hitachi Data Systems website at: <http://www.emc.com>
- **Software requirements:** For information about software requirements and supported filer operating systems, see the *Quest NetVault Backup Compatibility Guide* available at: <https://support.quest.com/technical-documents>
- **Install NDMP license:** On the EMC Celerra or VNX Storage System, install the NDMP license.

i | **NOTE:** The installation and configuration procedures are described in the *Quest NetVault Backup Plug-in for NDMP User's Guide*.

Configuration prerequisites

In addition to the configuration prerequisites covered in the *Quest NetVault Backup Plug-in for NDMP User's Guide*, verify that the following requirements are met:

- **Disable Removable Storage Manager (RSM) Service on Windows:** On Windows-based operating systems, stop and disable the RSM Service.
- **Disable SCSI RESERVE/RELEASE on Linux and UNIX:** For instructions, consult the relevant Operating System Guide.
- **Configure the Preferred Network Address setting:** In the Remote Backup model, configure the **Preferred Network Address** setting if the NetVault Backup machine to which the device is attached uses multiple network addresses. For more information about this setting, see the *Quest NetVault Backup Plug-in for NDMP User's Guide*.
- **Create a user account:** On the EMC system, create a user named **ndmp**. For more information, see the EMC documentation. Use this user account to add the NDMP Client. EMC systems do not support any other user for NDMP backups and restores.
- **Specify a single IP address:** EMC Storage Platform only supports a single IP address. You cannot specify multiple IP addresses when adding the NDMP Client.
- **Configure "param" settings:** On filers running DART 5.4 and 5.5, configure the following settings:

```
param NDMP scsiReserve=0
```

(Disables device sharing.)

```
param NDMP md5=1
```

(Enables md5 encrypted user authentication.)

```
param PAX readWriteBlockSizeInKB=128
```

(Sets the MOVER_RECORD_SIZE parameter to 128 KB.)

- **Enable SnapSure:** To use the SnapSure feature with the Plug-in *for NDMP*, enable the SnapSure functionality on the EMC system. SnapSure creates read-only, point-in-time logical views of a file system. This feature is only supported on DARTOS/ VNX File OE 5.5 and later versions. For more information, see the relevant EMC documentation for details.

You must also enable the SnapSure functionality for NDMP Volume-Based (VBB) Backups.

Backing up data

- [About Backup Dump levels](#)
- [Backing up volumes](#)
- [Backing up individual data paths](#)

About Backup Dump levels

The Plug-in for *NDMP* supports both Full and Incremental Backups. The backup type is determined by the Dump Level that can be set to Level 0 for a Full Backup or Levels 1 through 9 for Incremental Backups:

- **Level 0 or Full Backup:** A Full Backup provides a backup of all the data in the selected path.
- **Level 1 through 9 or Incremental Backup:** The Incremental Backups base themselves on the most recent lower-level Incremental Backup, and include any data that has changed or is new since the last Full or Incremental Backup.

Examples:

- Level 1 Incremental Backup includes any data that has changed or is new since the last Level 0 or Full Backup.
- Level 2 Incremental Backup includes any data that has changed or is new since the last Level 1 Incremental Backup, and so on, up to dump level 9.

Important notes

- If a directory is included in a dump level 0 backup, it is included in all future dumps even if no changes have occurred. In this instance, the directory is empty and does not contain content. However, it does not negatively affect the recovery of data.
- Only one dump level is maintained for each selected set of data. For example, after performing Level 1, Level 2, and Level 3 Incremental Backups, if you perform a Full Backup, the dump level is reset to 0. The next instance of the Incremental Backup is based on the Full Backup.
- If an Incremental Backup fails, the subsequent backup is based on the most recent backup of a lower level. For example, if dump level 1 is completed successfully, but dump level 2 fails, dump level 3 is based on dump level 1. The failure of an Incremental Backup is noted in the NetVault Backup logs.

Backing up volumes

- 1 In the Navigation pane, click **Create Backup Job**.

— or —

In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Create Backup Jobs**.

- 2 In **Job Name**, specify a name for the job.

Assign a descriptive name that lets you easily identify the job for monitoring its progress or restoring data. The job name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. There is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

- 3 In the **Selections** list, select an existing Backup Selection Set, or complete the following steps to create a set.

- a Next to the **Selections** list, click **Create New**.
- b On the **NetVault Backup Selections** page, open the NetVault Backup Server, and then open **NDMP Client**.
- c To display the **Volumes** node, open the applicable filer in the list of added servers.
- d Select the data that you want to back up:
 - **Back up all volumes:** Select the **Volumes** node.
 - **Back up individual volumes:** Open the **Volumes** node, and select the volumes that you want to back up.
- e Click **Save**, and in the **Create New Set** dialog box, type a name for the set.

i **NOTE:** A set name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. On Linux OS, the names can have a maximum of 200 characters. On Windows OS, there is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

- f To close the dialog box, click **Save**.

- 4 In the **Plugin Options** list, select an existing Backup Options Set, or complete the following steps to create a set.

- a Next to the **Plugin Options** list, click **Create New**.
- b Under **NDMP Backup Options**, configure the following settings.

Table 1. NDMP Backup Options

Option	Description
Dump Level	Select the type of backup that you want to perform. For a Full Backup, type or select 0. For an Incremental Backup, type or select any level from 1 to 9, based on the previous dump level.
Update /etc/dumpdates	The file “/etc/dumpdates” keeps a record of the backup, including the backup name, backup level, and snapshot time. Leave this check box selected if your backup strategy includes Incremental Backups. The information in this file is used to determine what data must be included in an Incremental Backup.
Do Direct Backup if Possible	To use DAR during restores, leave this check box selected. DAR enables precise tape positioning, which allows quick recovery of individual or a small set of files. Without DAR, the backup saveset is read sequentially to restore files. DAR requires Data ONTAP 6.x or later.
Save File Information	This option allows you to browse individual files and directories while selecting data during restore. You cannot restore individual files and directories if you clear this check box. Quest recommends that you leave this check box selected.
SnapSure	To back up a snapshot, select this check box. This feature is only supported on DART/VNX File 5.5 and later. The SnapSure functionality must be enabled on the EMC Celerra/VNX system to use this feature.

Table 1. NDMP Backup Options

Option	Description
Volume Based Backup	To use the EMC Celerra/VNX NDMP Volume Backup feature for performing backups, select this check box. This feature is only supported on DART/VNX File 5.5 and later. The SnapSure functionality must be enabled on Celerra/VNX to use this feature.
Allow Single File Backup	To back up an individual file, leave this check box selected.
EMC Directory Filter 1	You can use these boxes to specify the directories that you want to exclude from the backup. Type the full path, starting with a forward slash (“/”). Each box can contain one entry. Thus, you can specify a maximum of five entries in the filter boxes. You can use the wildcard characters “?” and “*” to specify the directory names. Wildcard characters can only be used at the last place in the directory name. For example, if you enter “/dir1/tmp*” in filter box, the plug-in excludes all directories starting with the letters “tmp” in the directory /dir1. Directory names are case-sensitive for NFS shares and case-insensitive for CIFS shares.
EMC Directory Filter 2	
...	
EMC Directory Filter 5	
EMC File Filter 1	
EMC File Filter 2	You can use these boxes to specify the files that you want to exclude from the backup. Type only the filename; do not specify the full path. Each box can contain one entry. Thus, you can specify a maximum of five entries in the filter boxes. You can use the wildcard characters “?” and “*” to specify the filenames. Wildcard characters can only be used at the first or last place in the filename. For example, if you enter “tmp*” in the filter box, the plug-in excludes all files starting with the letters “tmp”. Filenames are case-sensitive for NFS shares and case-insensitive for CIFS shares.
...	
EMC File Filter 5	

- c Under **Sub Jobs**, configure the following settings.

Table 2. Sub Jobs

Option	Description
Number of backups to run in parallel	Type or select the number of jobs that can run concurrently. The default value is zero. With the default setting, all jobs in parallel, limited only by the availability of drives, network bandwidth, and other resources. To achieve the required result, set the same value for each job.
Delete auto generated backup jobs on completion	The plug-in creates individual subjobs for each volume included in a backup. If this check box is not selected, all subjobs are listed on the Job Status page. This display can create confusion when you try to view the details of the parent job. To include only a single entry for the parent job, leave this check box selected.

- d Click **Save**, and in the **Create New Set** dialog box, type a name for the set.
 - e To close the dialog box, click **Save**.
- 5 Select or create the Schedule Set, Target Set, and Advanced Options Set. For more information about these sets, see the *Quest NetVault Backup Administrator’s Guide*.
 - 6 To submit the job for scheduling, click **Save & Submit**. You can monitor the job progress from the **Job Status** page and view the logs from the **View Logs** page.

To save the job definition without scheduling it, click **Save**. You can view, edit, or run this job from the **Manage Job Definitions** page. This job is not displayed on the **Job Status** page until you submit it.

For more information about **Job Status**, **View Logs**, and **Manage Job Definitions**, see the *Quest NetVault Backup Administrator’s Guide*.

Backing up individual data paths

- 1 In the Navigation pane, click **Create Backup Job**.

— or —

In the Navigation pane, click **Guided Configuration**, and then on the **NetVault Configuration Wizard** page, click **Create Backup Jobs**.

- 2 In **Job Name**, specify a name for the job.

Assign a descriptive name that lets you easily identify the job for monitoring its progress or restoring data. The job name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. There is no length restriction. However, a maximum of 40 characters is recommended on all platforms.

- 3 Next to the **Selections** list, click **Create New**.

- 4 On the **NetVault Backup Selections** page, open the NetVault Backup Server, and then open **NDMP Client**.

- 5 Click the applicable filer, and select **Enter Backup Path** from the context menu.

- 6 In the **NDMP Backup Request** dialog box, configure the **Directory** option.

Specify the full path to the directory that you want to back up. Use the following format to specify the backup path:

```
/<file system>/<parentDirectory>/<subdirectory>
```

To back up an individual file, type the full file path and verify that the **Allow Single File Backup** check box is selected. Use the following format to specify the file path:

```
/<file system>/<parentDirectory...>/<file name>
```

- 7 Set the **Dump Level** and the remaining backup options.

For more information, see [NDMP Backup Options](#).

- 8 To save the settings, click **Ok**.

- 9 Complete [Step 5](#) and [Step 6](#) in [Backing up volumes](#).

Restoring data




- Restoring data using the plug-in
- Restoring Incremental Backups
- Renaming or relocating data
- Restoring data to an alternate filer
- Searching for files in savesets
- Viewing media list

Restoring data using the plug-in

- 1 In the Navigation pane, click **Create Restore Job**.

On the **Create Restore Job — Choose Saveset** page, the saveset table provides a list of available savesets.

The table shows the saveset name (Job Title and Saveset ID), creation date and time, saveset size, and saveset status. The saveset status is indicated using the following icons.

Icon	Description
	Saveset is online (all segments are online).
	Saveset is partially online (some segments are online).
	Saveset is offline (all segments are offline).

The saveset list is sorted by creation date (newest to oldest). You can sort the list by one or more columns, as required. The arrowhead next to the column name indicates the sort order.

- 2 To filter the saveset list, use the following filter options.

Filter	Description
Client	Displays savesets created for particular clients. The default selection is Any . <ol style="list-style-type: none"> 1 To use this filter, click the Client box. 2 In the Choose Client dialog box, select the clients. 3 To close the dialog box, click OK.
Plugin Type	Displays savesets created using a particular plug-in. The default selection is Any . <ol style="list-style-type: none"> 1 To use this filter, click the Plugin Type box. 2 In the list, select the plug-in.

Filter	Description
Date	<p>Displays savesets created during a specified period. The default selection is Any.</p> <ol style="list-style-type: none"> 1 To use this filter, click the Date box. 2 In the list, select the option that you want to use. The available options are Last 24 hours, Last Week, Last Month, Last 6 Months, Last Year, and Any.
Job	<p>Displays savesets created for particular jobs. The default selection is Any.</p> <ol style="list-style-type: none"> 1 To use this filter, click the Job box. 2 In the Choose Job dialog box, select the jobs. 3 To close the dialog box, click OK.

- 3 Select the saveset that you want to use, and click **Next**.

When you select a saveset, the following details are displayed in the **Saveset Information** area: job ID number, job title, tag, server name, client name, plug-in name, saveset date and time, retirement setting, Incremental Backup or not, archive or not, and saveset size.

- 4 On the **Create Selection Set** page, select the data that you want to restore:
 - **Restore entire saveset:** Select the root node.
 - **Restore individual files and directories:** Select the target files and directories in the selections tree. The selections tree can only be browsed if the **Save File Information** option was selected during backup.

i | **IMPORTANT:**

- If you omit child-level items after selecting the parent node, the job fails. To perform selective restores, open the parent node, and select each item that you want to restore.
- EMC Celerra/VNX systems do not allow you to restore system files on Linux- and UNIX-based operating systems. The system files include character device files, block device files, FIFO (named pipe files), sockets, doors, and other special files. The restore job might fail if you include these files.
- EMC Celerra/VNX systems do not support individual file restores on deduplicated volumes. For details, see the EMC guide *Configuring NDMP Backups on EMC Celerra/VNX*.

- 5 Click **Edit Plugin Options**, and configure the following settings.

Table 3. Restore options

Option	Description
NDMP Server	This option specifies the target filer name. It is only required when you want to restore data to an alternate filer. By default, it is set to the name of the original filer from which the data was backed up. Do not change the NDMP Server while restoring data to the same filer.
Direct Access Restore Mode	Select the appropriate Direct Access Restore (DAR) mode from the following: <ul style="list-style-type: none"> • Use Direct Access Restore if Possible: To perform a direct-access restore if the backup was direct and the mover and data server can complete DAR, select this option. If these conditions are not met, a nondirect-access restore is performed. • Use Direct Access Restore by Recovering Individual Files: To restore a directory and its file contents, select this option. When you use this option, empty directories in the saveset are ignored. You must select this option if any item was omitted during data selection; otherwise, the restore job fails. • Only Do Direct Access Restore: To force a direct-access restore, select this option. It can be only used if the backup was direct and the mover and data server can complete a direct-access restore; otherwise the restore job fails. • Never Do Direct Access Restore: To perform a standard nondirect-access restore, select this option.
Incremental Restore	To recursively extract data and reconstruct the selected subtree to the state it was in at the time of backup, select this check box. This option is equivalent to setting the environment variable <code>EXTRACT=N</code> . The plug-in overwrites the existing files and deletes the files that were not present at the time of backup.
Restore ACLs	To restore ACLs from the backed-up file, select this option. This option is equivalent to setting the environment variable <code>EXTRACT_ACL=Y</code> . You can use this option only if the Backup ACLs option was selected during backup.

i | IMPORTANT:

- When individual files are selected for DAR, their parent-level directory permissions are not restored.
- When running DAR, NetVault Backup organizes the restore requests into groups of 1024 files at a time. When a restore job consists of more than 1024 total files, multiple restore requests are issued. So, multiple log entries are displayed for the job.

6 To save the settings, click **OK**, and then click **Next**.

7 In **Job Name**, specify a name for the job.

Assign a descriptive name that lets you easily identify the job for monitoring its progress. The job name can contain alphanumeric and nonalphanumeric characters, but it cannot contain non-Latin characters. There is no length restriction. However, a maximum of 40 characters is recommended on all platforms

In the **Target Client** list, the client from which data was backed up is selected by default. Do *not* change this setting.

8 Select or create the Schedule Set, Restore Source Set, and Advanced Options Set.

For more information about these sets, see the *Quest NetVault Backup Administrator's Guide*.

9 To submit the job for scheduling, click **Submit**.

You can monitor the job progress from the **Job Status** page and view the logs from the **View Logs** page. For more information about these functions, see the *Quest NetVault Backup Administrator's Guide*.

Restoring Incremental Backups

The incremental restores build on each other. To restore an Incremental Backup, you must have all the backups from Level-0 through the last backup in the backup sequence that you want to restore.

- 1 Restore the Full or Level 0 Backup.

For more information, see [Restoring data using the plug-in](#).

- 2 Restore each Incremental Backup in the backup sequence, starting with the lowest-level backup and going to the last backup that you want to restore (that is, in the same order in which they were created).

For each dump level, follow the steps outlined in [Restoring data using the plug-in](#).

i | **IMPORTANT:** All NDMP backups are effectively snapshots of the volume. When you restore a dump backup in an increment series, it restores all the data in the saveset. At the same time, it deletes the files present on the filer, but not available in that saveset. Thus, it reconstructs the subtree as it was at the time of backup.

Renaming or relocating data

When restoring a backup, you can rename the directories to create a copy of the data instead of overwriting of the existing versions. You can also relocate the data to a different volume. This procedure can be useful if the original volume is down or if you are dealing with limited bandwidth or capacity.

i | **NOTE:** This feature is only available to savesets that were created with the **Save File Information** option.

To rename or relocate data during restore:

- 1 Complete [Step 1](#) through [Step 4](#) in [Restoring data using the plug-in](#)
- 2 Click the volume that you want to rename, and select **Rename** from the context menu.
- 3 In the **Restore Rename** dialog box, configure the following option:
 - To rename a file or directory, type the new name.
 - To relocate the item to a different volume, type the volume name. You can also rename while relocating by specifying a new path. The volume to which you are relocating must exist on the filer.

Click **OK** to close the dialog box.

After you close the dialog box, the plug-in updates the corresponding node in the selections tree to display the new name and location for the file or directory.

- 4 Complete [Step 5](#) through [Step 9](#) in [Restoring data using the plug-in](#).

Restoring data to an alternate filer

To relocate a backup to an alternate filer, use the following procedure. This procedure can be useful during a server migration or disaster recovery operation.

Prerequisites

Before you start the restore procedure, add the target filer to the plug-in. For more information, see the *Quest NetVault Backup Plug-in for NDMP User's Guide*.

Restore procedure

- 1 Complete [Step 1](#) through [Step 4](#) in [Restoring data using the plug-in](#).
- 2 To rename or relocate data during restore, complete [Step 2](#) and [Step 3](#) in [Renaming or relocating data](#).
- 3 Click **Edit Plugin Options**, and configure the following option:
NDMP Server: This option specifies the target filer name. By default, it is set to the name of the original filer from which the data was backed up. To relocate the data to an alternate server, type the name of the target filer.
- 4 Select the appropriate DAR method. For more information about the available options, see [Restore options](#).
- 5 Complete [Step 6](#) through [Step 9](#) in [Restoring data using the plug-in](#).

Searching for files in savesets

The **Search** option on the **Create Restore Job — Choose Saveset** page allows you to find specific files or data items without opening any savesets or browsing through their contents. You can use filenames or regular expressions to find the data items that you want to restore.

- 1 On the **Create Restore Job — Choose Saveset** page, click **Search**.
- 2 In the **Search for files in savesets** dialog box, configure the following options:
 - **Search String:** Type the search string.
 - **Regular expression search:** To use POSIX (Portable Operating System Interface for Unix) regular expressions in the **Search String** box, select this check box.
 - **Case sensitive:** To perform a case-sensitive search, select this check box.
- 3 Click **Search**. On the **Search Results** page, you can view the savesets that contain the specified files or data items.
- 4 Select the items you want to restore. You can only restore items from one saveset. Click **Next**.
- 5 Complete [Step 5](#) through [Step 9](#) in [Restoring data using the plug-in](#).

Viewing media list

The **Media List** option on the **Create Restore Job — Choose Saveset** page lets you view information about the media items used to store a backup. You can view details about the data segments and index segments for a backup.

- 1 On the **Create Restore Job — Choose Saveset** page, select the applicable saveset.
- 2 In the **Saveset Information** area, click **Media List**.
In the dialog box that is displayed, you can view the following details:
 - **Backup size:** This area shows the total size of the saveset in number of bytes
 - **Data segment table:** This table shows information about the media items that contain the data segments. You can view the following details: media label, media group label, stream ID, starting byte number, ending byte number, and media location
 - **Index segment table:** This table shows information about the media items that contain the index segments. You can view the media label and media location.
- 3 To close the dialog box, click **Close**.

Troubleshooting

- [Common errors](#)

Common errors

The following is a list of some common errors and their solution.

Table 4. Troubleshooting

Description	Symptom	Solution
The NetVault Backup Service fails to start on a Windows-based NetVault Backup Server.	Check the Windows Event Viewer for the following message: PDT FATAL: lock file "postmaster.pid" already exists	NetVault Backup cannot start if the PostgreSQL database that is used to store the system data does not start. To correct this issue, delete the " postmaster.pid " file from the location referenced in the log and restart the NetVault Backup Server.
After restarting the machine, the NetVault Backup Service sometimes fails to start on a Windows-based NetVault Backup Server.	Check the Windows Event Viewer for the following message: FATAL: could not create any TCP/IP sockets " for a PostgreSQL source	NetVault Backup cannot start if the PostgreSQL database that is used to store the system data does not start. To correct this issue, start the Task Manager, and click Show processes from all users . You can see multiple instances of postgres32.exe running on the system. To remove all instances of postgres32.exe , select any instance of this process, and click End Process . Start the NetVault Backup Service.
The NetVault Backup Service starts, and then stops immediately on a Linux-based machine.	No error messages are displayed.	This issue can occur if the Postgres service cannot resolve the host name localhost , and fails to start. Check the <code>/etc/hosts</code> file, and if the file does not contain an entry for localhost , add the entry.

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Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.com>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request.
- View Knowledge Base articles.
- Sign up for product notifications.
- Download software and technical documentation.
- View how-to-videos.
- Engage in community discussions.
- Chat with support engineers online.
- View services to assist you with your product.