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## **DXi-Series Configuration and Best Practices Guide for Veeam Backup & Replication**

Quantum: 6-67851-01 Rev D

BPG00020A-04



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## **DXi-Series Configuration and Best Practices Guide for Veeam Backup & Replication**

This guide seeks to help Quantum customers who own DXi-Series systems (DXi4000-Series, DXi6000-Series, DXi8000-Series, and DXiV1000-Series), and who also use Veeam Backup & Replication get the most out of their investment. It is also intended to help Quantum field sales teams by providing guidance to enhance the installation and integration of Veeam Backup & Replication with Quantum DXi-Series systems. This guide includes advice and best practices for using Quantum DXi-Series systems with Veeam Backup & Replication.

### **How to Use This Guide**

This document assumes that the reader has basic expertise with Veeam Backup & Replication, basic networking, SAN, Hyper-V, and VMware experience. It also assumes that the reader has a Quantum DXi installed in a working Veeam Backup & Replication environment.

This document provides key recommendations and useful information for quickly setting up a DXi system with Veeam Backup & Replication. It expands on these recommendations and discusses the features and performance tuning considerations relevant to NAS attached storage.

This document is organized according to the NAS storage target access methods to be employed with Veeam Backup & Replication. Currently Veeam does not support VTL thus the DXi will appear as a CIFS or NFS storage repository.

### **Shortcuts to Quick Start Activities**

To go directly to any of the following sections, click that section's name.

- » **[Online Documentation for your Quantum product](#)**
- » **[Summary of Tuning Parameters for Configuring Veeam Backup & Replication with DXi NAS](#)**
- » **[Best Practices Guide with DXi NAS](#)**
- » **[Common Operational Considerations for Veeam Backup & Replication](#)**

### Documentation and References

The following is a list of documents, references, and links where you can find additional information regarding specific activities and products. Access too many of the documents below requires a valid serial number or user login. Please have that available when following the hyperlinks to the documents.

#### *Online Documentation for your Quantum products*

[Quantum service and support for drivers, firmware, software, and all product documentation.](#)

#### DXi Product Planning Guides

The DXi Product Planning Guides helps you too configure and use your DXi storage solution correctly from the start. As a best practice verify that the DXi has been successfully deployed in the infrastructure using the Quantum site planning documentation:

- [DXi8500 Site Planning Guide](#)
- [DXi6900 Site Planning Guide](#)
- [DXi6800 Site Planning Guide](#)
- [DXi6700 Site Planning Guide](#)
- [DXi4700 Site Planning Guide](#)
- [DXi4000 Site Planning Guide](#)
- [DXi V-Series Planning Guide](#)

#### DXi User's Guide

Refer to the DXi user's guide for detailed information about all the configuration and functions the DXi is capable of:

- [DXi8500 User's Guide](#)
- [DXi6900 User's Guide](#)
- [DXi6800 User's Guide](#)
- [DXi6700 User's Guide](#)
- [DXi4700 User's Guide](#)
- [DXi4000 User's Guide](#)
- [DXi V-Series User's Guide](#)

#### Network Attached Storage

Refer to the following documents for NAS Share setup:

- [DXi8500 User's Guide](#)
- [DXi6900 User's Guide](#)
- [DXi6800 User's Guide](#)
- [DXi6700 User's Guide](#)
- [DXi4700 User's Guide](#)
- [DXi4000 User's Guide](#)
- [DXi V-Series User's Guide](#)

### [DXi Replication](#)

Refer to the following documents for DXi-to-DXi Replication setup:

- [DXi8500 User's Guide](#)
- [DXi6900 User's Guide](#)
- [DXi6800 User's Guide](#)
- [DXi6700 User's Guide](#)
- [DXi4700 User's Guide](#)
- [DXi4000 User's Guide](#)
- [DXi V-Series User's Guide](#)

### [DXi Knowledge Base](#)

The knowledge base can help you quickly search for Quantum product articles:

- [Quantum Knowledge Base](#)

### ***Veeam Backup & Replication Documentation***

These direct documentation links require a Veeam [user account](#). Simply create a user account and remain logged in to enjoy the following links:

- [Veeam User Guide VMware](#)
- [Veeam User Guide Hyper-V](#)
- [Best Practices for Deployment & Configuration \(VMware\)](#)
- [U-AIR Wizards User Guide](#)
- [Veeam PowerShell Reference Guide](#)
- [Evaluator's Guide \(VMware\)](#)
- [Evaluator's Guide \(Hyper-V\)](#)
- [Veeam Knowledge Base](#)

## Summary of Tuning Parameters for Veeam Backup & Replication

For backup administrators who are well versed with Veeam Backup & Replication and Quantum DXi systems, the following table offers a summary of suggested parameters/values. As with any modifications to a system that impacts performance and/or tuning, your results may vary and are not guaranteed.

Parameter or Option	Setting
Compression	Do not enable Veeam's Compression feature. While Veeam supports compression, to obtain effective performance rates you should NOT compress your backup data before sending it to a DXi appliance.
Encryption	Do not enable Veeam's Encryption feature. While Veeam Backup & Replication supports encryption, for best performance utilize the hardware encryption provided by the DXi appliance.
Deduplication Storage Compatibility	Yes
Active Full	Yes - Recommended
Synthetic Full	Yes
Incremental	Yes
Reverse Incremental	Not recommended
Storage Optimization	Local target
Change block tracking	Yes
Align backup file data blocks	No
Decompress backup data blocks before storing	Not recommended for backup performance.
vPowerNFS	Recommend vPowerNFS be kept on primary storage.
<b>Miscellaneous Options</b>	<b>Recommendations</b>
Veeam Backup Server	CPU: any x86/x64 processor. Memory: 4 GB RAM. Hard Disk Space: 2 GB for product installation. 10 GB per 100 VM for guest file system catalog folder (persistent data). Sufficient free disk space for Instant VM Recovery cache folder (non-persistent data, at least 10 GB recommended). Network: 1 Gbps LAN for on-site backup and replication, 1 Mbps or faster WAN for off-site backup and replication. High latency links are supported, but TCP/IP connection must not drop.
Backup Proxy	CPU: modern x86/x64 processor (minimum 2 cores). Using faster multi-core processors improves data processing performance, and allows for more concurrent jobs. Memory: 2 GB RAM per concurrent job. Using faster memory (DDR3) improves data processing performance. Hard Disk Space: 300 MB. Network: 1 Gbps LAN for on-site backup and replication, 1 Mbps or faster WAN for off-site backup and replication. High latency links are supported, but TCP/IP connection must not drop.
Enterprise Manager	Processor: x86/x64 processor. Memory: 2 GB RAM. Hard Disk Space: 2 GB for product installation plus sufficient disk space to store guest file system catalog from connected backup servers (according to data retention policy). Network: 1Mbps or faster connection to Veeam Backup & Replication servers.
Transport Method	SAN or HotAdd recommended
Server Name	Use only standard ANSI characters for the computer name of the computer on which you want to install Veeam Backup & Replication.
<b>Windows OS Options</b>	<b>Recommendations</b>
Network	On heavy utilized system consider increasing TCP/IP timeout on Veeam Backup & Replication backup proxy. Reference Microsoft Knowledge Base <a href="http://support.microsoft.com/kb/q191143/">http://support.microsoft.com/kb/q191143/</a>  TcpMaxDataRetransmissions  Adjusting the following TCP/IP setting by adding a subkey in the registry should reduce the number of timeouts by allowing more time for the connection to complete. This setting is not present in the registry by default.  Start Registry Editor (Regedt32.exe) and go to the following subkey:

	<p>HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters</p> <p>On the Edit menu, click Add Value, and then add the following information: Value Name: TcpMaxDataRetransmissions Value Type: REG_DWORD - Number Valid Range: 0 - 0xFFFFFFFF Default Value: 5 Decimal New Value: 10 Decimal</p> <p>Click OK, and then quit Registry Editor. Reboot after registry change has been made.</p> <p>Apply the following Microsoft hot fixes to improve performance: <a href="http://support.microsoft.com/kb/979612">http://support.microsoft.com/kb/979612</a> <a href="http://support.microsoft.com/kb/982383">http://support.microsoft.com/kb/982383</a></p>
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Consult any of the following resources on the Help menu if you have questions or difficulties:

- Use the Veeam Backup & Replication User Guide for comprehensive information about Veeam Backup & Replication.
- Use the Veeam Backup & Replication help center for searchable, topic-based documentation.
- Use the Veeam Backup & Replication built in help for access to offline searchable documentation.

## Configuring Veeam Backup & Replication with the DXi-Series

### Configuring Veeam Backup & Replication with DXi NAS

A Network Attached Storage (NAS) unit is essentially a self-contained computer connected to an Ethernet network, with the sole purpose of supplying data storage services to other devices on the network. Several DXi models can present themselves as a NAS appliance for backup purposes. Before you can use a DXi system as a NAS appliance you must first configure a NAS share on the DXi.

**Important Note:** The DXi is **NOT** a Network Attached Storage device to be used to store customer data. The DXi only emulates a NAS device for the sole purpose of being a Backup-to-Disk target for backup applications such as Veeam. Do *not* use the DXi NAS share as “Drag-and-Drop” file storage.

A DXi system can serve as a NAS backup system where the following protocols are supported:

**CIFS Protocol** -The CIFS (Common Internet File System) protocol defines a standard for remote file access using many computers at a time. This protocol allows users with different platforms to share files without installing additional software. This protocol is used with Windows networks.

**NFS Protocol** - The NFS (Network File System) protocol was originally designed by Sun Microsystems and allows all network users to access shared files stored on computers of different types. NFS provides access to shared files through an interface called the Virtual File System (VFS) that runs on top of TCP/IP. Users can manipulate shared files as if they were stored locally on the user's own hard disk. With NFS, computers connected to a network operate as clients while accessing remote files, and as servers when providing remote users access to local shared files. This protocol is used with UNIX/Linux networks.

### NAS Device Path Considerations

**Network segmentation** is the process of splitting a single network into several sub-networks or segments. The advantages of a segmented network are improved performance and security. Performance is improved because there are fewer hosts on the segmented network, which in turn minimizes local traffic. Security is improved because the data traffic is contained on this segment and is not visible to the outside network.

**Note:** If you are using network segmentation and Automated Deployment Services (ADS), you must use the data segment IP information for ADS management, NOT the management segment. ADS uses the Server Message Block (SMB) data protocol to manage the NAS shares on your system, which requires that the management traffic use the data segment.

DXi systems allow you to configure your network for separate segment types. The three primary segments are defined by the type of network traffic that can be used on that segment. The three types of network traffic are:

- **Replication traffic** - This segment is used exclusively for replication data movement.
- **Management traffic** - This segment is used exclusively for DXi remote management (Web page access).
- **Data traffic** - This segment is used exclusively for NAS data movement.

Each network segment has its own network interface (IP address, network mask, and default gateway). In this way, the segment is separated from other network segment traffic.

**Note on Bonding:**



For Mode 0 Bonding, whether or not Round Robin or LACP is used, the ports on the Ethernet switch that the DXi are connected to must be in a matching group type as the Bond 0 group on the DXi.

The DXi also supports Mode 1 Bonding (active/backup) which does not require any special switch configuration. With a Mode 1 bond only one interface in the bond is active. If that interface loses connectivity, the MAC address is moved to another interface in the bond which then becomes active. Typically this is used when connections to the DXi are routed through two completely separate switches for redundancy / failover.

Veeam Backup & Replication seamlessly integrates with a DXi-Series disk backup system using the NAS (CIFS or NFS) interface. Once installed and configured, Veeam can manage backups through the DXi and take advantage of the system's capabilities, such as data deduplication and replication.

Installing and configuring the DXi and Veeam for NAS operation consists of the following major steps, which are discussed below:

1. Configure the DXi for NAS
2. Configure the Veeam Backup & Replication NAS Repository

### Configure the DXi for NAS

The DXi system allows you to configure it to present its storage capacity as NAS shares that are compatible with Veeam Backup & Replication. You can create NAS shares for use with Windows or UNIX networks. You can also join the DXi to a Windows domain or workgroup and manage users.

In the DXi Remote Management Console (the GUI) the **Configuration** page allows you to configure many of the features of the DXi, including storage presentation. A NAS license must be installed on the DXi prior to configuring NAS shares.

Configuring the DXi for NAS lets you choose which network protocol will be used as the transport method to the DXi. CIFS (Windows) and NFS (UNIX/Linux) are available on the **NAS > Summary** tab. After NAS Shares have been configured on the DXi, Veeam Backup & Replication can be configured to use these shares as storage resources.

### Configure the Veeam Backup & Replication NAS Repository

#### *Configuring Veeam Backup & Replication for CIFS Repository*

#### Prerequisites

- CIFS share created on DXi.
- DXi added to Workgroup or Active Directory.
- User account credentials with access to DXi CIFS.
  - 1 [Launch the New Backup Repository wizard](#)
  - 2 [Specify name and description](#)
  - 3 [Choose the type of repository](#)
  - 4 [Specify server or share](#)
  - 5 [Configure path and load control settings](#)
  - 6 [Specify vPower NFS settings](#)
  - 7 [Review properties and components](#)
  - 8 [Finish working with the wizard](#)

### *Configure Veeam Backup & Replication for NFS Repository*

#### Prerequisites

- NFS share created on DXi.
- UNIX/Linux server installed.
- NFS share mounted on UNIX/Linux server.
  1. [Launch the New Backup Repository wizard](#)
  2. [Specify name and description](#)
  3. [Choose the type of repository](#)
  4. [Specify server or share](#)
  5. [Configure path and load control settings](#)
  6. [Specify vPower NFS settings](#)
  7. [Review properties and components](#)
  8. [Finish working with the wizard](#)

## Best Practices Guide with DXi NAS

### Number of Shares Considerations

Quantum DXi systems support both CIFS (Windows-based) and NFS shares. Each system can support multiple NAS shares, with a maximum of 128 shares. It is recommended that users create only the required number of shares for each backup proxy.

When using NAS shares on DXi systems, it is recommended to create at least one share for each backup proxy to use. Backup proxies should not share the NAS shares during normal backup operations.

### Network Share Access Control Considerations

In Windows Active Directory environments, the share acts as the target for Veeam Backup & Replication. The share is not intended as primary storage or drag-and-drop storage. A best practice is to create a new account and workgroup, as opposed to joining the domain, to limit access and prevent accidental file deletion by another user. It is recommended that you **DO NOT** reconfigure or delete NAS shares while data is being written. There is no mechanism to detect the I/O and provide a warning to the user.

In NFS environments, root access to an NFS share is not allowed, and the access rights will be changed to **nfsnobody** as a security precaution. This does not impact the access to the share from the backup application.

### Network Considerations

Some network considerations include:

- Use a dedicated network for backup data, or use QoS features that guarantee network bandwidth. Another option would be to use virtual networks (VLANs) to segregate backup from production network traffic.
- Configure network interface cards (NICs) in the server and clients, and set routers to full duplex.
- Cabling:
  - Use only CAT5e or CAT6 cables (1Gb/s rated cables).
  - Use only OM3 or OM4 (Aqua) Fibre Optic cables (10Gb/s rated FC).
- If you are using a DNS server, verify that the DNS server configuration settings are correct by using nslookup on the host name, as well as the IP address.
- It is also a good idea to add the HOSTNAME and IP Address to the host file.
- Use multiple DXi ports when connecting to the network. The more DXi Ports used, the better the performance capability will be across the ports.
- Install and configure multiple network ports on the Backup Proxy servers. Dedicate multiple ports for the transfer of data to the DXi.
- For redundancy, connect at least two DXi ports to an Ethernet switch.
- Leverage DXi's ability to setup multiple networks. The DXi network configuration allows for integration into nearly any networked environment.
- Set each switch port used by the DXi to auto-negotiate/auto-sensing. The DXi network interface cards are preset to auto/auto and cannot be changed.

### Veeam Backup & Replication Storage Settings and Tuning Considerations

When using a DXi as NAS for a backup repository, consider the following:

- Setup the backup proxy to use the HotAdd or SAN transport methods. These two methods allow for the fastest data retrieval from source possible.
- Increase the Max Concurrent Tasks on the backup proxy to what it can reliably handle depending on the environment.
- When creating the backup repository, limit the number of Concurrent Jobs count to avoid saturating the repository.
- When creating the backup repository select Align Backup File Data Blocks for optimal deduplication performance.
- Avoid running reversed incremental backups.
- Avoid running synthetic full backups.
- Recommend using no compression for faster backups and better deduplication ratios.
- Use local target for storage optimizations. Select WAN for storage optimization if running remote backup.
- Recommend to run active full backups periodically with traditional incremental backups.
- Recommend Veeam advanced deployments and distributed deployments.

### Additional Best Practice Considerations

Several operational considerations are common to the two access methods (CIFS and NFS). See the Common Operational Considerations for [Common Operational Considerations for Veeam Backup & Replication](#) section at the end of this document for more information on Deduplication, Encryption, Compression, Backup Streams and Replication.

## Common Operational Considerations for Veeam Backup & Replication

### Deduplication Data Considerations

Deduplication results can be negatively impacted by compression, encryption, software deduplication, and multiplexing. These functions all change the data stream in a way that obscures patterns in the data content. They will reduce the performance and deduplication from any downstream appliance, including DXi systems. To obtain effective deduplication rates, you should NOT encrypt, deduplicate, or compress your backup data before sending it to a DXi appliance.

#### **Good Candidates for Data Deduplication**

Data deduplication can work well with virtual machines, large databases and unstructured data such as Microsoft Office documents (PowerPoint presentations, Word documents, and Excel spreadsheets), SQL, Oracle and Exchange databases and source code.

#### **Not So Good Candidates for Data Deduplication**

Data deduplication does *not* work well with encrypted data, in-line compressed data, SQL with LiteSpeed (in-line compression), Oracle with multi-channel RMAN (in-line multiplex), Exchange 2010, and compressed or uncompressed music files or movies/videos.

For long-term archiving, it is recommended to vault the data to a physical tape device.

### Replication Considerations

For first-time replication setups, when the DXi share is first created, it is highly recommended to manually initiate a Replication while that share is empty. This facilitates the first replication following the first backup to that share/partition.

- The replication is only available to NAS shares with deduplication enabled.
- The DXi supports 128-bit AES encryption for replication.
- Data is only encrypted while in transit between the replication source and replication target.
- Data is unencrypted upon arrival at the replication target.
- Encryption may affect replication performance. You should disable encryption if your WAN is already secured.

For more information, please refer to Quantum's *DXi-Series Best Practices for Data Replication*.

### Oversubscription of Space on the DXi

Deduplication will reduce the amount of space used on the physical system by the virtual tapes. Users are advised to monitor for Low Space conditions on the DXi and free up virtual media before reaching this threshold. A best practice would be to trigger the Space Reclamation process *before* the DXi reaches approximately 80 percent full.

The **Disk Usage** overview on the **Home** page of the DXi Management GUI displays the following information about disk usage on the system (Note: values are displayed as an amount and as a percentage of the total capacity in the system):

**Disk Capacity** - The total usable disk capacity of the DXi.

**Available Disk Space** - The disk space available for data storage (free space).

I/O Write Low Threshold state (Yellow) - Free disk space is equal to or less than 500GB + [10GB \* (Total system capacity in TB)]

**Stop Write state (Red)** - Free disk space is equal to or less than 250GB

**Stop I/O state (Red)** - Free disk space is equal to or less than 10GB

**Note:** For optimal system performance, Quantum recommends keeping the amount of Available Disk Space (free space) at 20% or more.

**Note:** When disk capacity is low, target replication to the system is paused. In addition, space reclamation is automatically started to free up disk space.

### Space Reclamation

Changes were made to the space reclamation process in DXi 2.2 software for DXi6500 and DXi6700 systems. These changes were also made available to DXi4000 and DXi8500 systems beginning with DXi 2.2.1 software version.

**Space reclamation** is the process used to delete blocks that are no longer referenced by metadata, returning capacity to the free space pool (within the blockpool) for future reuse. Starting with DXi 2.2.1 software, there are now two space reclamation modes:

- New Mode
- Legacy Mode

#### **New Mode**

**New Mode** space reclamation was introduced in DXi 2.2 to increase performance and is now the default space reclamation mode. With New Mode, when space reclamation is manually started using the Remote Management Console **Space Reclamation** page or initiated as a scheduled event, only Stage 2 (Calculating Deletion Candidates) and Stage 3 (Deleting Candidates) are run. This improves performance and avoids running Stage 1 and Stage 4 (Compaction), which require a lot of disk I/O.

When disk capacity is low, space reclamation automatically starts so it can free up disk space on the system. In this case, all four stages of space reclamation are run, which is the same in Legacy mode.

**Note:** You can still manually execute Compaction using the `syscli --start compaction` command.

#### **Space Reclamation Status Page**

The **Space Reclamation** page of the Remote Management Console application can be used to report the status of New Mode space reclamation. After starting space reclamation manually from the **Space Reclamation Status** page (**Utilities > Space Reclamation > General**), the system skips **Stage 1 – Compaction** and starts running **Stage 2 - Calculating Deletion Candidates**.

After Stage 2 completes, **Stage 3 – Deleting New Candidates** runs.

When Stage 3 completes, Stage 4 – Compaction is skipped and the space reclamation process completes. The **Reclaimable Space** field displays an **Advanced Reporting** link.

Review the **Disk Usage** graph on the Capacity report to identify the space reclamation statistics, including **Reclaimable Space**. The **Disk Usage** graph is new and was added to the **Capacity** report in the most recent version of DXi Advanced Reporting (2.1.2). Use the Disk Usage graph to monitor the amount of disk space that can be freed during space reclamation. The following statistics display on the graph:

- **Used Disk Space** (light blue) is the amount of disk capacity that is currently being used to store data, including deduplicated data, data that has not been deduplicated, and data allocated to the blockpool that is available to be reused after space reclamation. Used Disk Space increases as data is ingested by the system. Use this information to see the amount of used and free disk capacity on the system.
- **No Deduplication** (dark blue) is data not intended for deduplication and is the amount of disk space used by shares or partitions that are not configured for deduplication.
- **After Reduction** (dark green) is the amount of data that remains after the ingested data has been deduplicated and compressed. This is the amount of data consumed by the blockpool. Use this information to see the amount of deduplicated, compressed data stored on the system.
- **Reclaimable Space** (light green) is the amount of disk space available for new deduplicated data after space reclamation has been run. For non-deduplicated shares and partitions, the DXi may free reclaimable space to create more needed free space when all free space is allocated for Used Disk Space. As previously described, with New Mode space reclamation, reclaimable space is reused by the blockpool even if compaction is not run.

### Legacy Mode Space Reclamation in DXi 2.2 Software

**Legacy mode** space reclamation is the only method of space reclamation used in pre-DXi 2.2 software. However, there is a situation in DXi 2.2 when Legacy Mode space reclamation is still run automatically by the system. When free space is low, the system will automatically run Legacy Mode space reclamation to free disk space. In this situation, all four stages of space reclamation are run.

It is recommended to schedule daily space reclamation to manage the available space. The scheduled time should be configured to start the reclamation process after daily backups are complete. The default schedule is weekly, and the default time for the space reclamation is set to 12:00 AM on Sunday. These parameters are user configurable and should be configured as to not interfere with the normal backup window.

### Backup Stream Considerations

- Limiting the number of [Concurrent](#) backups and data ingestion rate will help control the load on the repository and can prevent possible timeouts.
- [Advanced Deployment](#) and [Distributed Deployment](#) can greatly relieve the load on the Veeam Backup Server.
- [Resource Scheduling](#) can automatically select and use optimal resources for configured jobs.
- Setup multiple networks where possible so each Veeam proxy will have its own data path to the DXi.

### DXi Backup I/O Guidance

The Reversed Incremental Backup first runs a full backup on the VM and then all subsequent backups are incremental. It is a backup method that allows you to perform a forever-incremental backup strategy. During the Reversed Incremental Backup Veeam injects changes into the .vbk file and then rebuilds it to the most recent state of the VM. This will cause simultaneous read and write operation on the DXi. This can negatively impact performance causing an I/O performance bottleneck on the DXi. To avoid this situation consider running a standard incremental backup and then use the Active Full Backup method thus preventing any I/O bottlenecks within the storage device. Multiple Full backups will not consume as much space on DXi storage because all similar blocks will be deduplicated by the DXi.

The Synthetic Full Backup is a method that synthesizes a backup from the first Full Backup and subsequent Incremental Backups. The underlying difference between an Active Full Backup and Synthetic Full Backup is how the VM data is retrieved. With the Synthetic Full Backup Veeam will not retrieve the VM data from the source but rather synthesize a full backup from the repository. This causes the workload to shift from the source and proxy to the DXi repository storage. This method can negatively impact performance causing an I/O bottleneck on the DXi. To avoid this situation consider running a standard incremental backup and then use the Active Full Backup method thus preventing any I/O bottlenecks within the storage. Multiple Full backups will not consume as much space on DXi storage because all similar blocks will be deduplicated by the DXi.

Instant VM Recovery allows the Veeam user to immediately restore a VM back into production from the DXi storage repository. This allows the Veeam user to minimize recovery time objectives and minimizes disruption from production downtime. The booting of the virtual machines from the DXi repository is similar in performance to the Reversed Incremental and Synthetic Full Backup. This method of restore could negatively impact performance causing an I/O bottleneck at the DXi. The DXi works well with the Instant VM Recovery method although it is not designed as primary storage. Thus Instant VM Recovery should be viewed only as a temporary solution until primary storage is available.



## Helpful Resources

The following is a list of documents, references, and links where you can find additional information regarding specific activities and products.

### **Veeam online resources:**

- [Veeam Backup & Replication Documentation](#)
- [Veeam Backup & Replication online Help Center](#)
- [Customer Support Portal](#)
- [Veeam Community Forums](#)
- [Veeam Online University](#)
- [Veeam Online Backup Academy](#)
- [Veeam FAQ](#)

### **VMware Web Site**

<http://www.vmware.com/>

### **Microsoft Web Site**

<http://www.microsoft.com/en-us/default.aspx>

### **Quantum Web Site**

<http://www.quantum.com>

### **StorageCare Guardian Web Site**

<http://www.quantum.com/ServiceandSupport/Services/GuardianInformation/index.aspx>

### **StorageCare Vision Web Site Reference**

<http://www.quantum.com/products/Software/quantumvision/Index.aspx>

### **Quantum Service Web Site**

<http://www.quantum.com/ServiceandSupport/Index.aspx>

### **Call Center Americas:**

To contact Quantum's world-class support representatives, please refer to the information below:

- Telephone (toll free): 800-284-5101
- Telephone (local, not toll-free): 949-725-2100
- Hours of operation (subject to change without notice): 7 days a week, 24 hours a day with valid contract
- 7x24x4 or 7x24x2 coverage available.
- Users with all other contracts can contact Quantum during normal business days from 5 AM to 5 PM US Pacific Time.

### **View Quantum's Service-Level Objective:**

<http://www.quantum.com/ServiceandSupport/ServiceLevelAgreement/Index.aspx>