Disk-based Backup for Virtualized Environment via Infortrend EonStor DS, ESVA, EonNAS 3000 / 5000 and Veeam Backup and Replication

Application Note

Abstract

The document describes, as an example the usage of virtual machine backup in virtualization environment via Infortrend EonStor DS subsystem and Veeam Backup and Replication software. Infortrend's reliable and robust storage system, coupled with Veeam's comprehensive VM backup software, provides a cost-effective and easy backup solution for virtualized environments to meet customer needs.

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Product Models Covered by This Document

This document applies to the following product models:

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- **EonStor DS Series: G6, G7 and G7i models**
- **ESVA Fibre Channel and iSCSI Series**
- **EonNAS 3000 and 5000 Series**

For more information regarding individual product models, please visit www.infortrend.com.

Preface

This document assumes that users are already familiar with the configuration of Infortrend storage subsystems and have already installed the Veeam software into a computer. It also assumes that users have installed the VMWare ESXi virtualized environment for virtual machine backup. This document uses Infortrend's EonStor DS to introduce the usage of Backup and Replication with Veeam. Applicable storage systems are listed in paragraph "Product models covered by this document" on page 3.

For more related information about subsystem configurations, please check the user manual came with the storage system, or visit Infortrend's official web site for more product information: http://www.infortrend.com

For more information about the Veeam Backup and Replication software, please contact Veeam directly: http://www.veeam.com

For more information of virtualized environment mentioned in this document, refer to the VMWare website: http://www.vmware.com/

<u>Introduction</u>

Server virtualization is a critical issue in current IT environments, especially the backup & recovery of virtualized hosts which have become more important than ever in recent years. Organizations of all sizes have been realizing that it is essential to have a server backup and disaster recovery plan with proper storage system and software that are built specifically for virtual environment.

Because Infortrend has already been providing virtualization-ready solutions to provide the best protection and performance for users, the Infortrend storage system can be used as the main data storage for virtual hosts. Of course, using the storage system as the VM backup target is still the best practice because users can receive the same benefits and capacity. Additionally, users can enjoy the optimal resource efficiency, application productivity, operational resilience and management simplicity at reduced costs.

With Infortrend's partnership with Veeam, who has built software specifically for virtual environments to provide fast backup, replication and recovery of virtual machines, users can protect the entire virtual infrastructure with industry leading features such as instant recovery, built-in deduplication & compression, centralized management and more. Customers can also leverage the fast, reliable and scalable storage system from Infortrend as well as the best in-class host-based VM backup software from Veeam. Customers can protect their investment in virtualization and maintain the operation continuously while meeting the ever-changing needs of their business.

System Topology

Before starting the virtual host backup process as described previously for best performance and protection, customers should design their virtual infrastructure carefully by leveraging the storage system as the virtual machine data storage, so that the source data can also reside in the storage system. Then users need to prepare another volume in the same or different storage system, which will be used for the backup target.
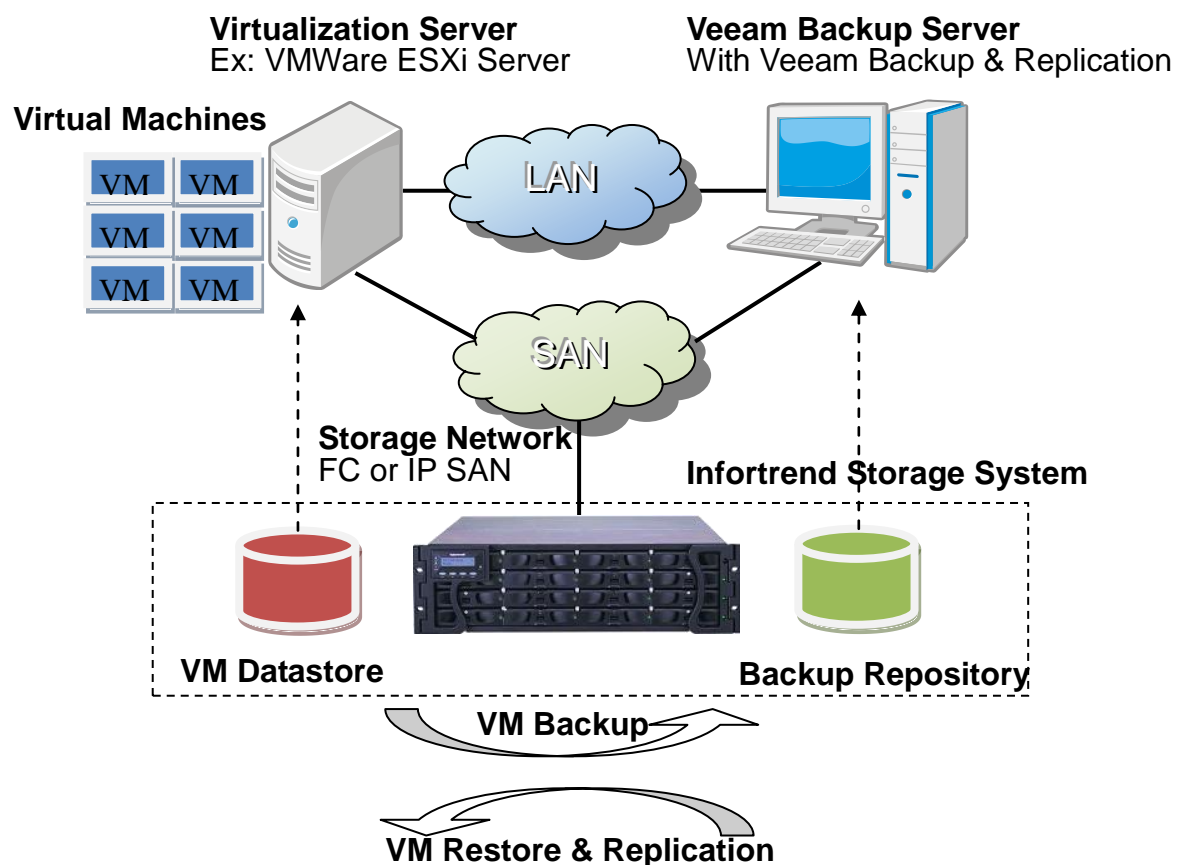

Figure 1: Integrated topology of Infortrend storage, virtualization server and Veeam software

Server topology

- **Virtualization Server:** For example, VMWare ESXi Server or Microsoft Hyper-V can be used as the virtualization server to manage and deploy the virtual hosts in users' virtualization environment. Since the datastore for virtual hosts is located in the storage system, the virtualization server should be also attached to a storage network (IP SAN or FC SAN) for users to access the datastore volume from the storage system.

- **Veeam Backup Server:** The Veeam software is installed in the host and is in charge for the backup jobs of virtual hosts. To communicate with the virtualization backup server, the Ethernet network (via LAN even WAN) will be

leveraged. Of course, the capacity in the storage system will be used as the backup target, and that means the backup server should also be attached to the storage network.

Storage system configuration

In the following scenario, two volumes are required for the backup source and target. The source volume is used as a datastore for the virtualization server to store its virtual host files, and the target volume is used for the backup server to keep the backup copies of data.

Using a redundant controller model of EonStor DS series to maximize utilization, two LVs (Logical Volume) have been built. Each LV is assigned to a different controller. For example, LV1 is assigned to controller slot A and LV2 to slot B. Then, one partition is created on each logical volume, and one partition is mapped to the virtualization server as the backup source and another partition is mapped to the backup server as the backup destination.

For the virtualization server, users need to add a scanned storage system first and name it as another datastore for placing virtual hosts (for example: Storage Datastore). Then virtual hosts can be deployed to moved to this datastore for better protection and performance. After the mapping process, the backup server will have a new disk from the Infortrend storage system. The disk can be mounted and formatted as a new volume with its own drive letter and name (for example: drive E: as the Backup Volume). The volume will be used as the backup target for the Veeam software.
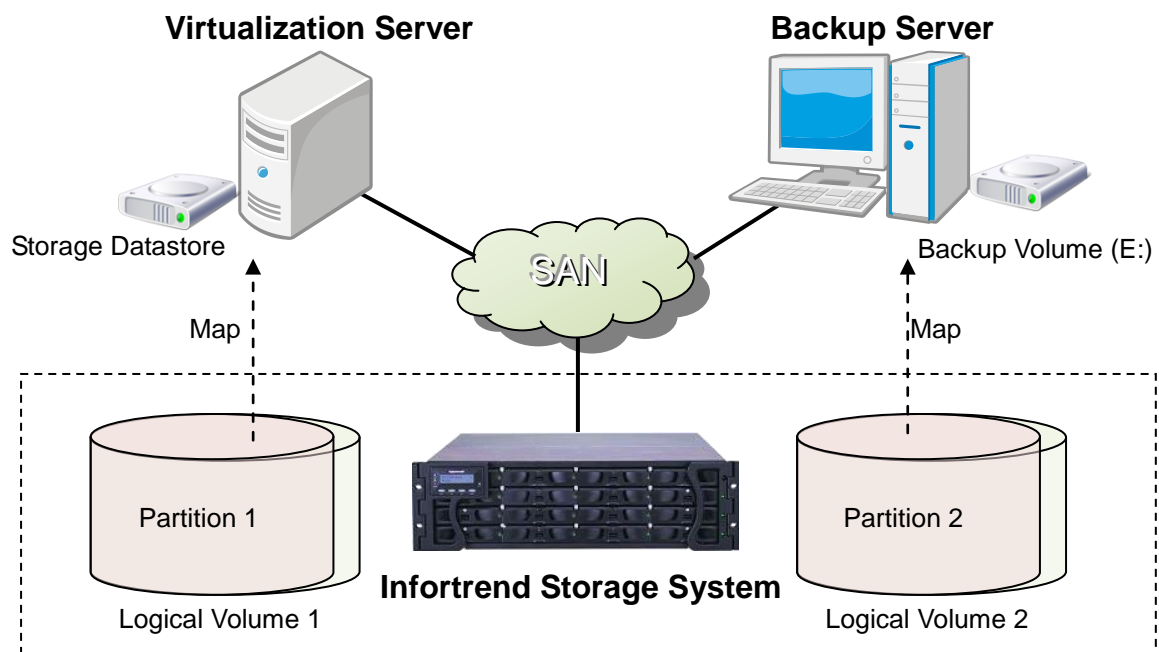

Figure 2: Storage configuration of Infortrend storage system

Backing up the Virtual Machine

Step 1: Add virtualization server to Veeam management infrastructure

After installing the Veeam Backup and Replication software, add the virtualization server with virtual hosts to the Veeam backup infrastructure first. If the server is successfully added, the virtualization server and all the virtual machines will appear in the software.
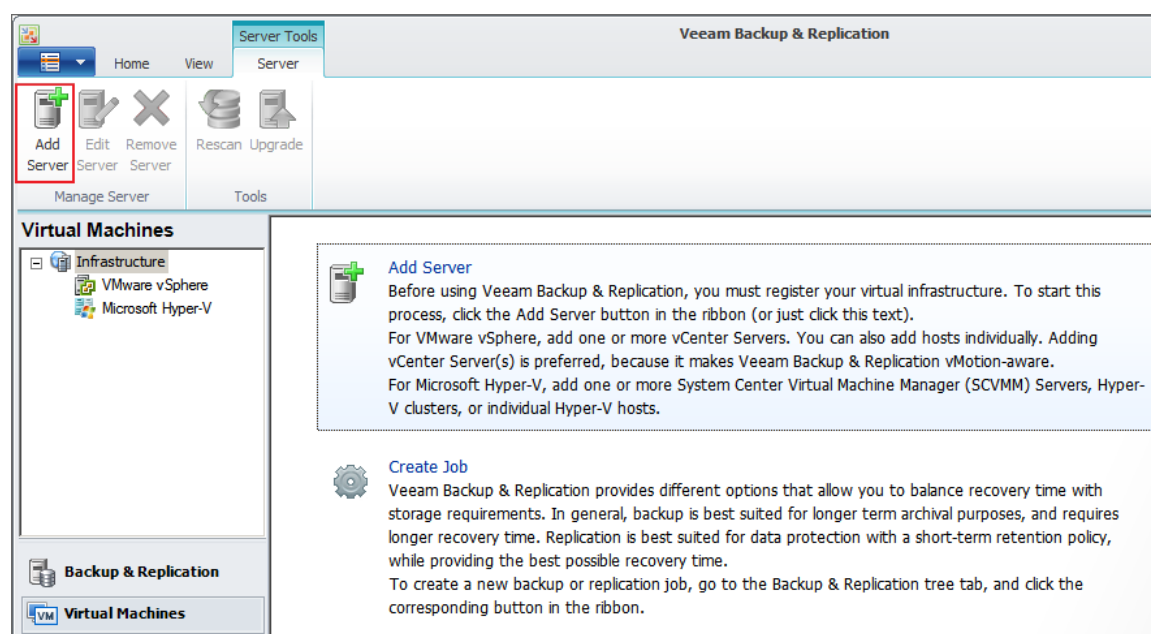

Figure 3: Add the virtualization server to Veeam's management infrastructure first

Step 2: Add the backup repository from Infortrend storage system

The next step is to add a volume as the repository for the backup process. Since a new formatted volume (Ex: drive E: from storage system) is available in the server, a new backup repository can be added by assigning the volume, or even a folder inside, on it. The repository will become the main backup destination for the backup task.

Enter the name of repository (via Microsoft Windows Server because of using a directly attached storage) and the drive (or a folder inside) for backup. Then a repository made by Infortrend storage system will be available and be ready for backup.
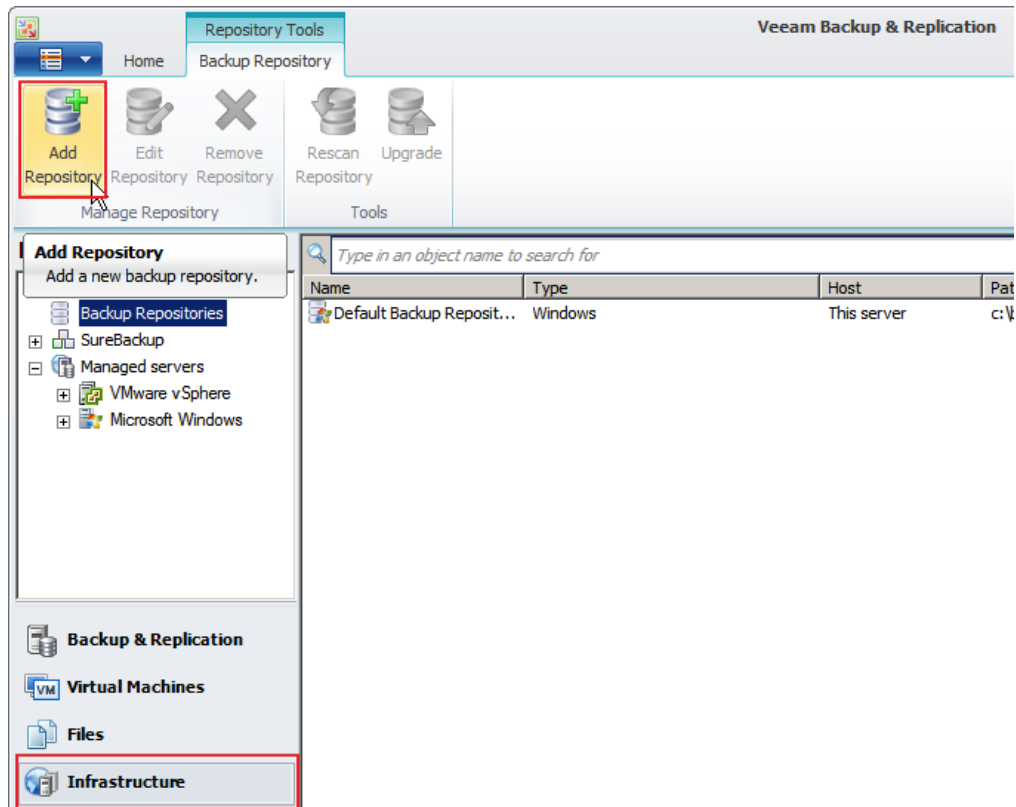
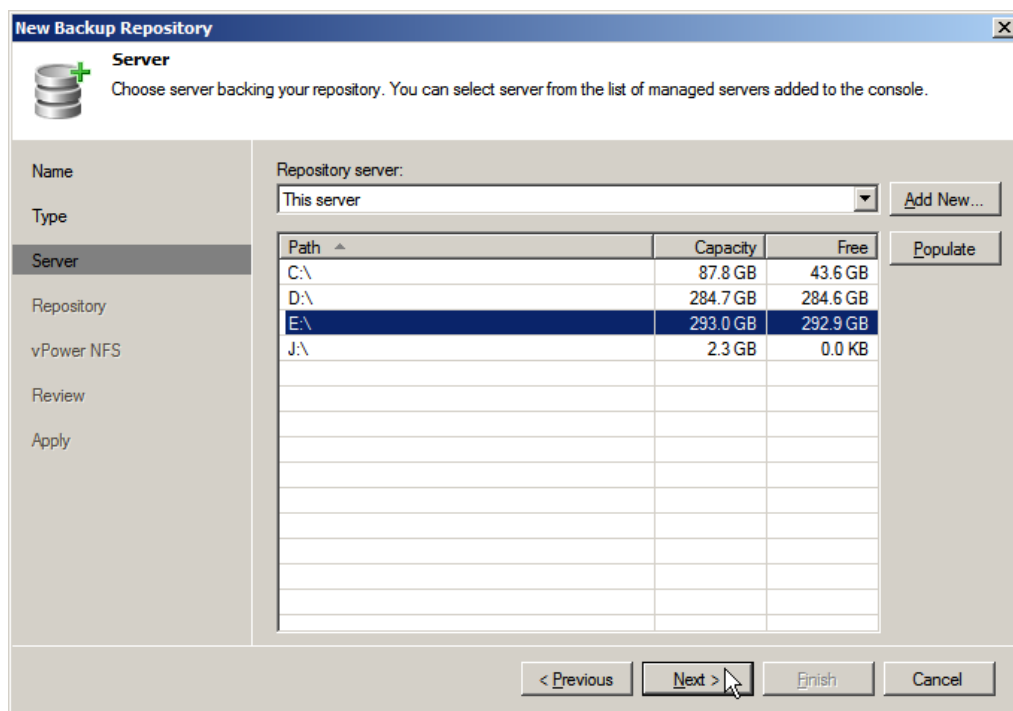Figure 4: Add a new repository as the backup target

Figure 5: Specify the disk drive mounted from the Infortrend storage system

Step 3: Edit the proxy settings

Veeam Backup and Replication software provides several modes for transmission of backup data. It leverages a backup proxy to handle the transportation. By default, it uses Automatic Selection mode and picks the best

topology automatically. In most cases, the software will use Network mode to guarantee that the backup job can be engaged successfully. But for this system topology, since the virtualization server and backup server are attached to the storage network and use the storage resources from the storage system, the transport mode should be manually changed to Direct SAN Access for best performance and efficiency.

After installing the Veeam software, a backup proxy in the same backup server will be prepared. If another host is not leveraged as the backup proxy server, just edit the setting of the default proxy server and choose Direct SAN Access as the preferred backup transport mode.
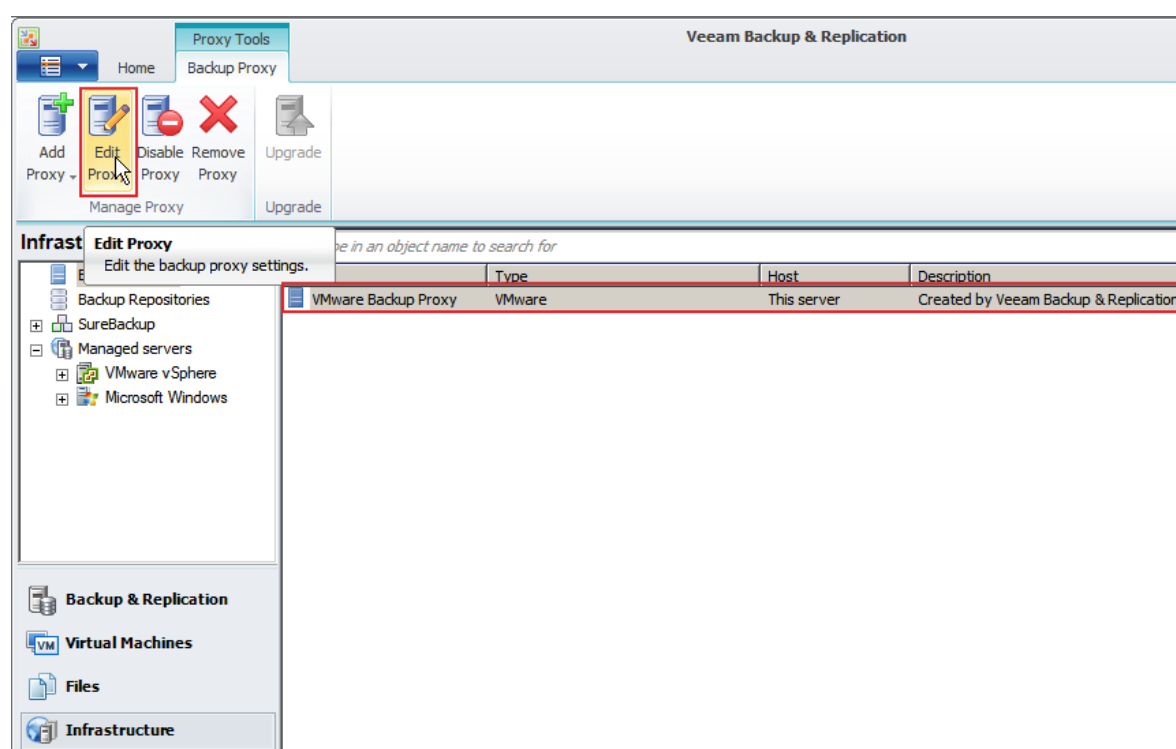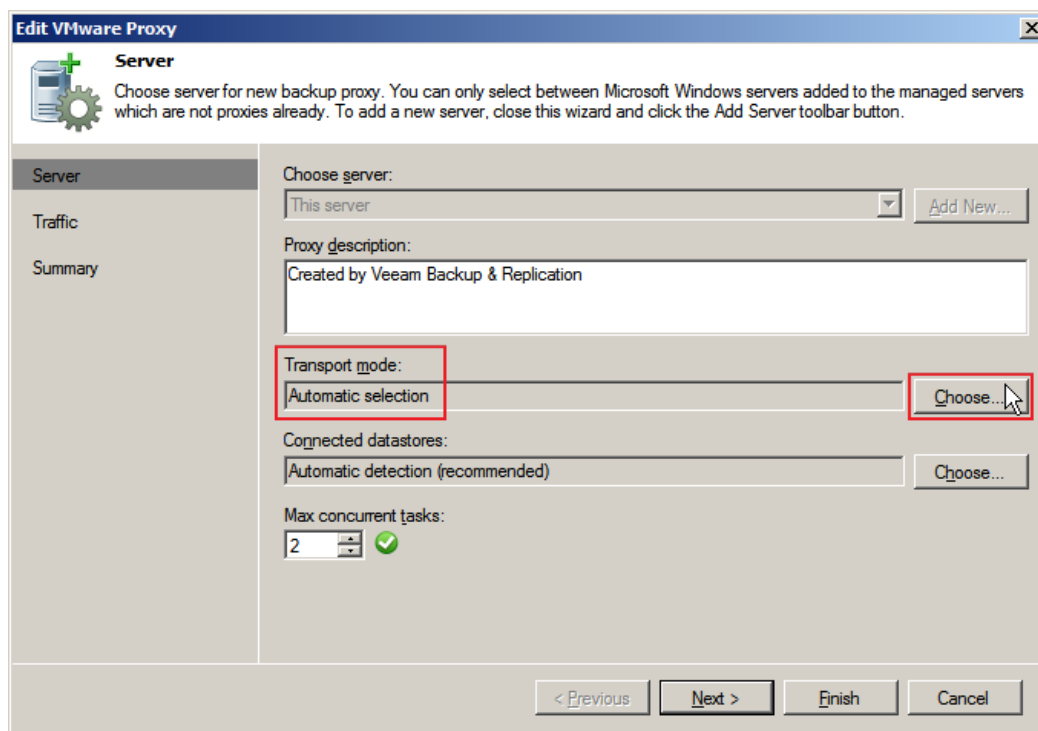

Figure 6: Edit the existing default backup proxy

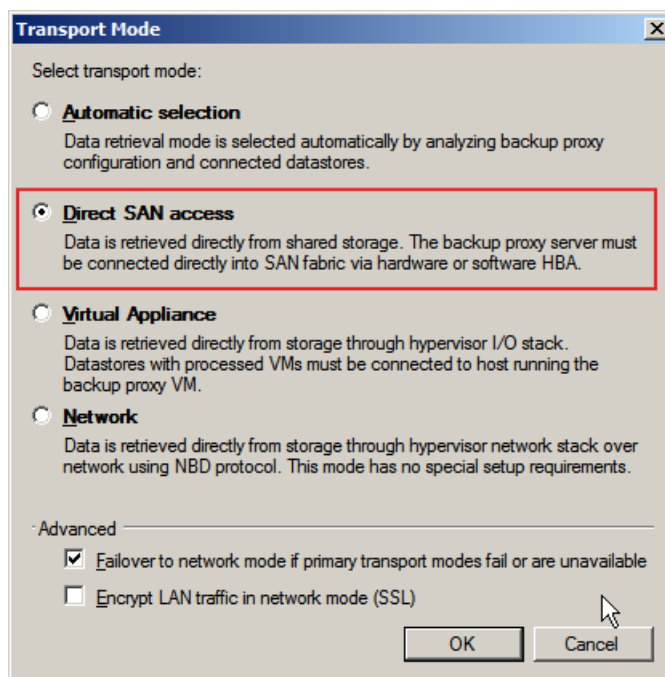Figure 7: Choose different transport mode for data transmission

Figure 8: Choose Direct SAN access as the default transport mode

Step 4: Map the partition containing the source datastore to backup server

For Direct SAN Access mode, the most important thing is that the backup server has direct access to the source datastore to accelerate the backup process. Veeam can use the source data directly and avoid some network and storage

intervention limited by virtualization infrastructure. Therefore, the partition used by the virtualization server has to be mapped to the backup server.

Caution! Since the partition is originally used by the virtualization server and will also be mapped to the backup server, it's better to map the partition using a specific filter and give the Veeam backup server read-only access to the source VMFS volume. Do not initialize, or assign a drive letter to, the disk found after the mapping operation.
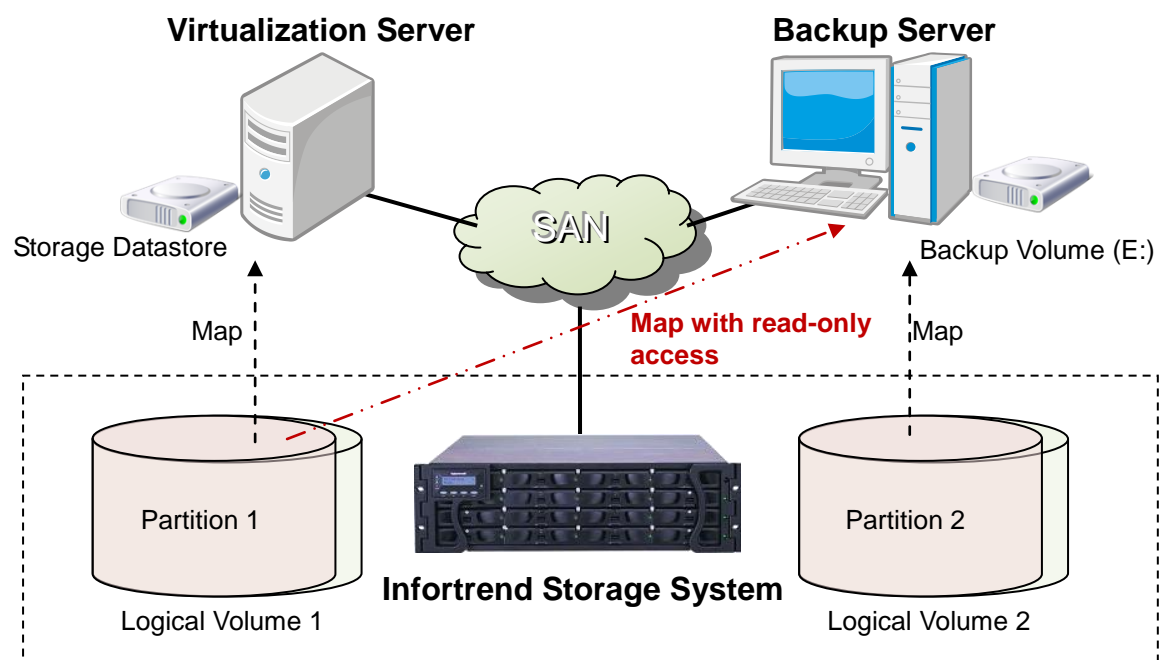

Figure 9: Map the source volume to the backup server with read-only access

Step 5: Rescan the storage

After mapping the source partition to the backup server, the new disk should become visible from the server. Scan the system to refresh all the managed servers to make sure that the new added disk can be used by Veeam. Or else, the Direct SAN Access transport mode may not work even if it has been configured.
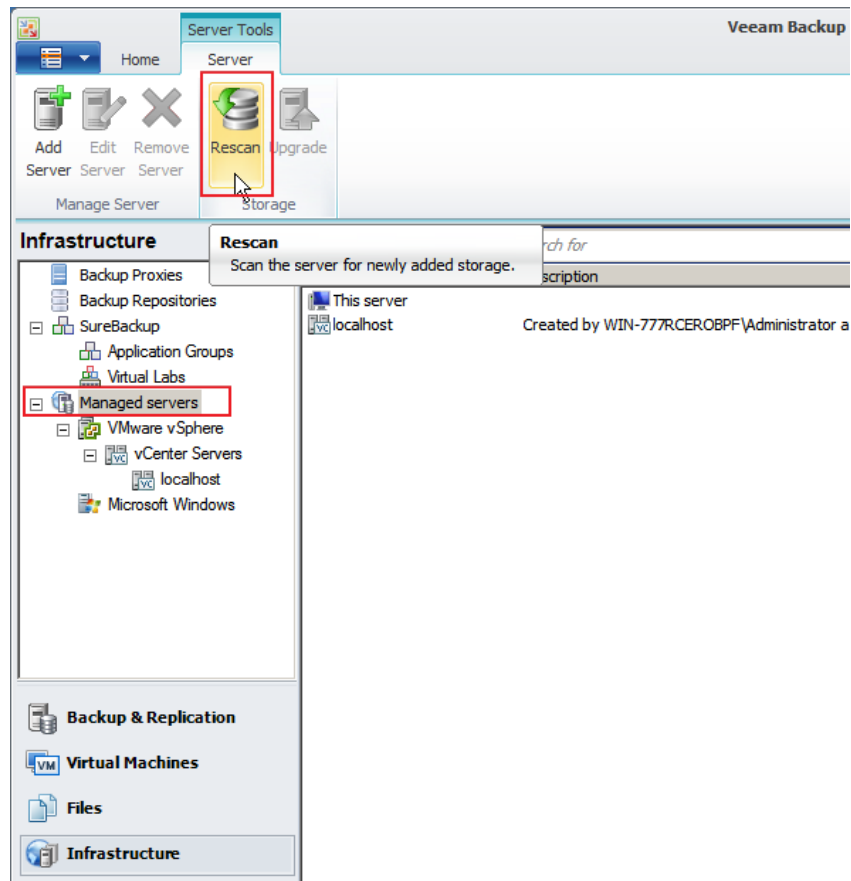
Figure 10: Scan managed servers in Veeam

Step 6: Create a backup job

When the backup source (after being added to the virtualization server and its virtual hosts) and the target (backup repository from Infortrend storage system) are ready and the related settings have been completed, users can start to create a new backup job. Give the job a name first, and choose a virtual host for backup from the virtualization server. Use the default backup proxy and select the backup repository from the storage system.
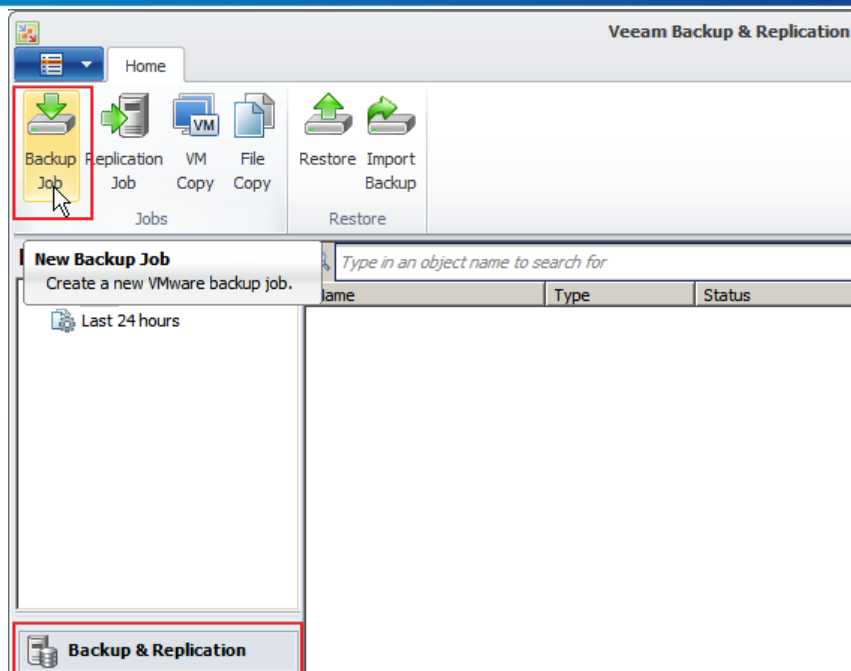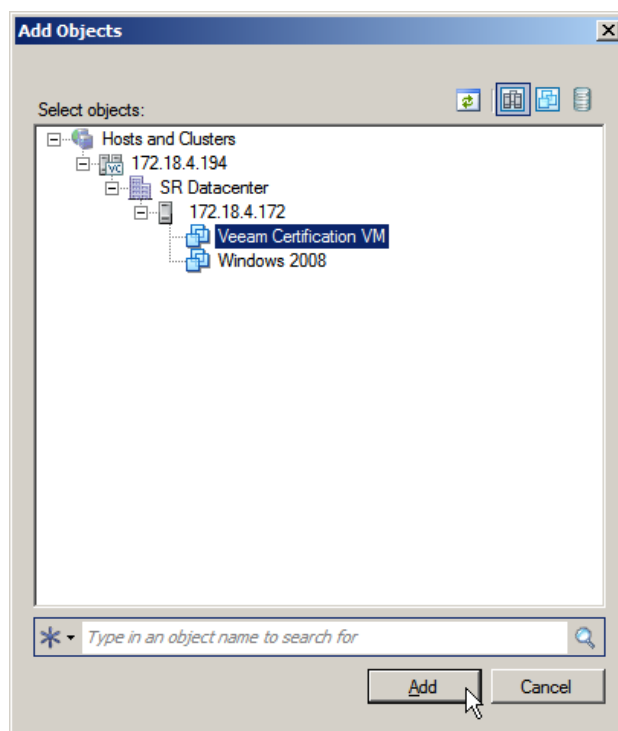
Figure 11: Start to create a backup job

Figure 12: Select a virtual host from the virtualization server

Figure 13: Specify the backup repository from the storage system (this step also includes advanced backup settings)

Veeam software also provides deduplication and compression options for the backup process. Use the advanced settings to modify the configuration. Those options are enabled by default. The built-in deduplication and compression capabilities can reduce the size of backup data, and therefore increase the efficiency of the storage system and further reduce overall costs. But they may take more time and consume more computing resources of the backup server.
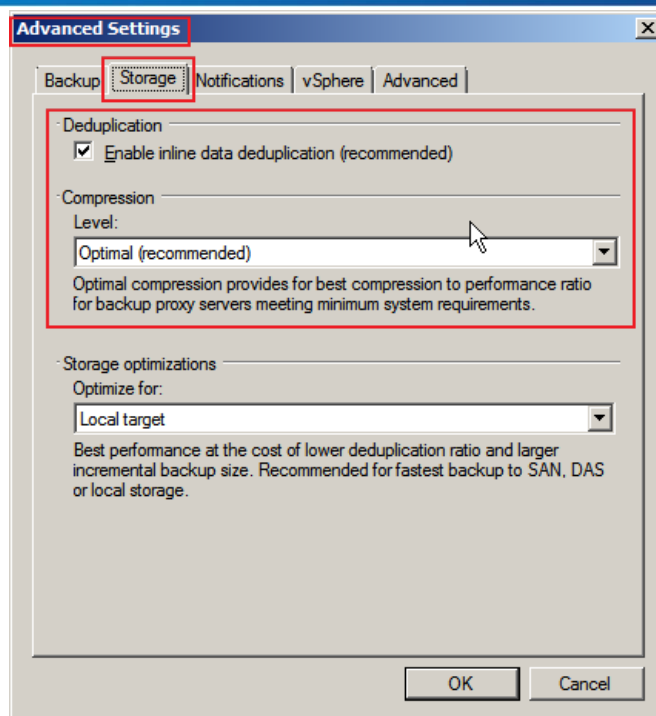
Figure 14: Toggle deduplication and compression in advanced settings

Leave the rest of options and parameters to default settings, and then the backup job can be started immediately or at a scheduled time. Now a virtual host backup job is available and users can check the backup progress through the job list.
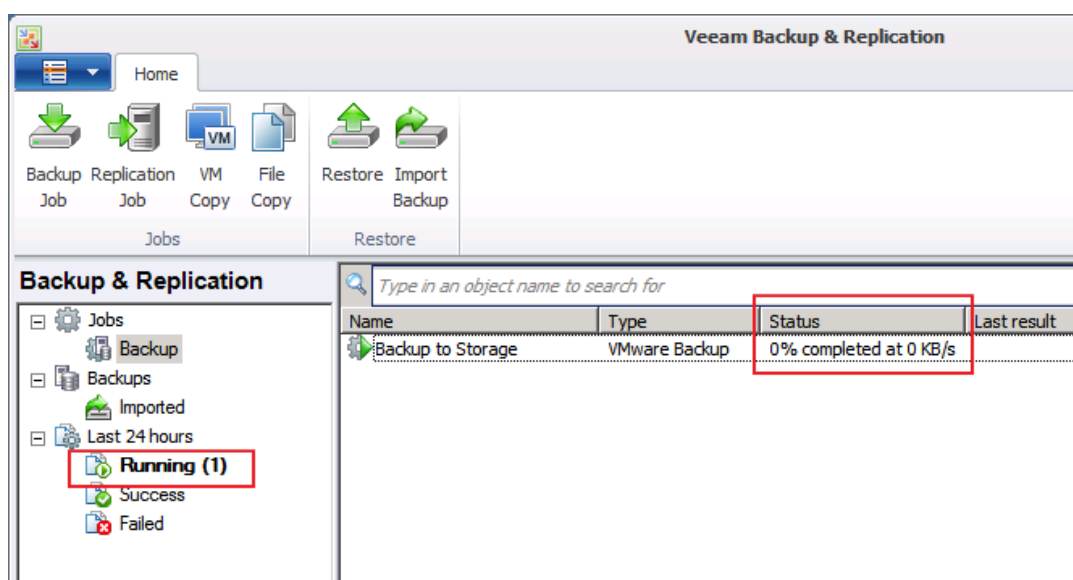

Figure 15: Check the backup progress in the job list

Step 7: Check the backup statistics and report

Users can check the detailed progress or the backup result via the Statistics and Report functions. Backup statistics will provide backup status, duration, data transferred, and processing rate, and even the detailed action involved in each

step. It also provides the backup bottleneck analysis for reference, so that users can tell if the limitation of backup performance was caused by the source (server), the proxy, the network between the source and the target or the target storage itself. The information is very useful for analyzing and improving the efficiency of the backup process.
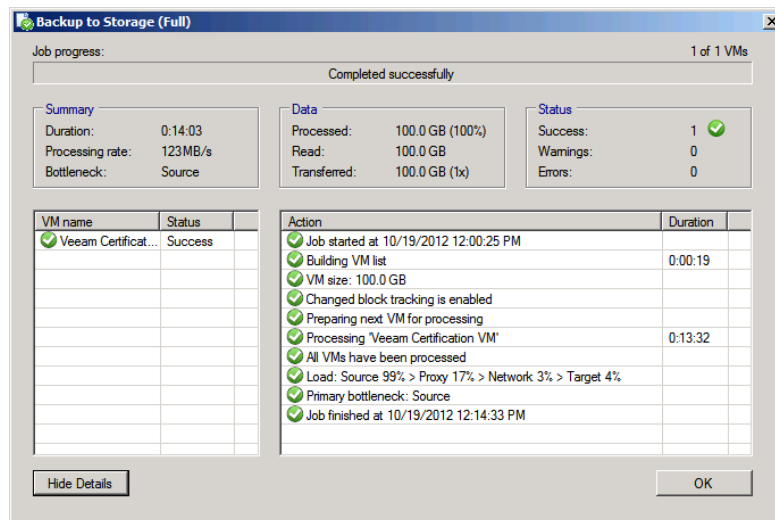

Figure 17: Check the backup statistics including the backup duration and process bottleneck

Restoring Backup Copies

Choose the restore type

Once the backup job is completed, Veeam provides several restore operations. Users can restore the entire VM (similar to replicating the same or even different virtualization server), restore by copying the VM files (.vmdk) directly, or restore virtual hard disks in a virtual host. For some operating systems (such as Microsoft Windows or Linux), it even allows users to restore specific files and folders from the virtual host backup.
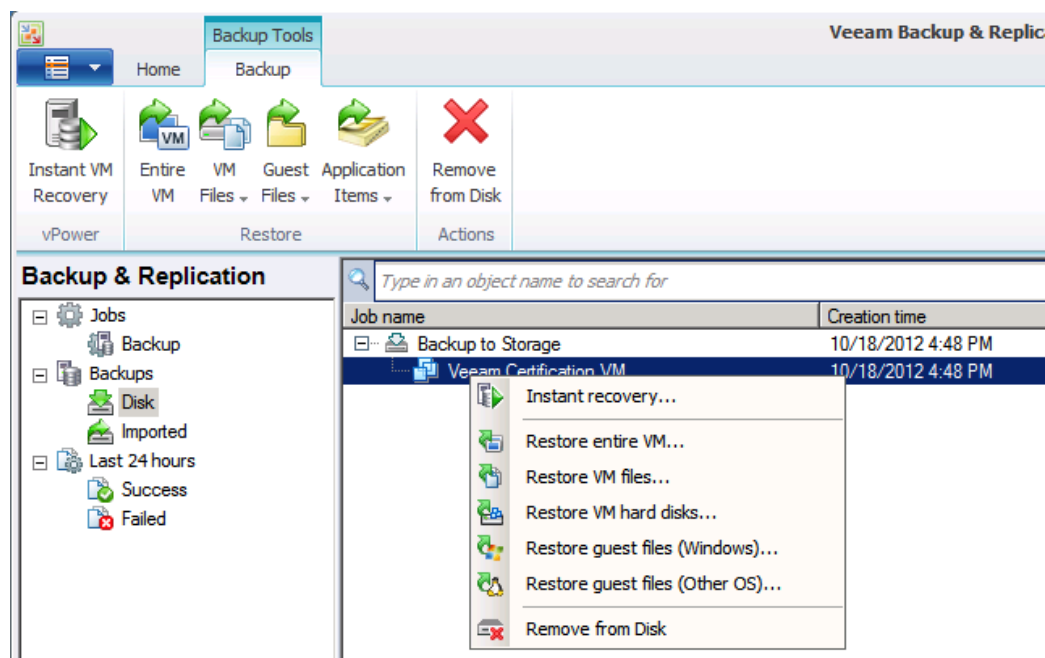

Figure 18: Veeam provides several restore options for the backup copy

Veeam supports a special restore method called Instant Recovery, which allows restoring the whole virtual host and is ready for use in a matter of seconds.

Step 1: Engage the instant recovery process

Select the backup copy first and choose to start the instant recovery process. If several backup operations have been completed, Veeam will leverage the incremental backup option and keep all differential backup data as different restore points (just like taking snapshot images). Before starting the recovery, pick a specific restore point for instant recovery.
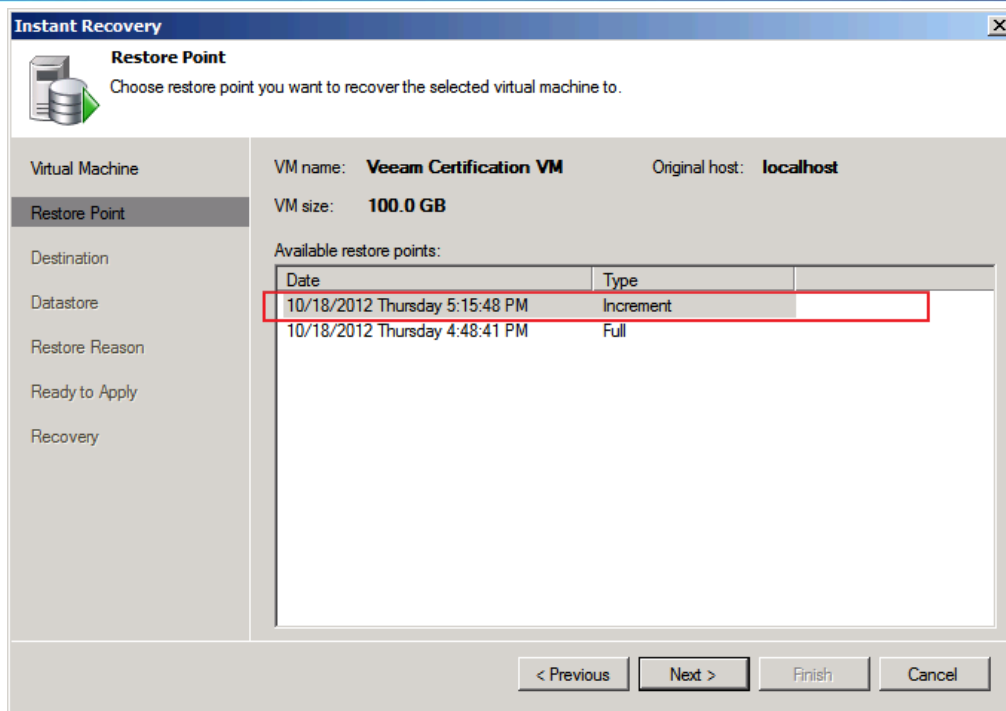
Figure 19: Pick a restore point first for instant recovery

Step 2: Choose the restore destination

Users can choose the same or different virtualization server as the restore destination. To use the recovered virtual host immediately, users can also connect VM to the network or power the virtual host automatically. Caution: if users try to restore to the same server where the backup copy resides, they need to change the restored VM name to avoid confliction with the existing virtual host. Also, connecting VM to the network directly may violate network configurations. Users have to modify the network interface related settings in advance.

Figure 20: Choose the restore destination and configure the recovered VM settings

After clicking the Next button several times, users will have another virtual host which is ready to be used in the virtualization server.

Restoring Backup Copies

Infortrend EonStor DS and Veeam Backup and Replication software provide a reliable backup and replication solution for a VM environment. This combination is a cost-effective disk-based backup solution that maximizes data reduction and scales to meet demanding enterprise environment needs.

Infortrend storage system provides robust storage to protect user's data no matter where the data is located in the production source side (or even in the backup target volume). It also provides high data transportation rate with excellent performance, and can significantly shorten the backup duration. To cope with the increasing amount of backup copies, Infortrend system also has the expansion scalability to meet any capacity requirements. Leveraging the capabilities of Veeam, Infortrend storage systems now support virtualization environments, and provide various efficient functions to accelerate backup processes (such as incremental backup) and reduce the size of backup copies (such as deduplication and compression). It helps users achieve better Recovery Point Objective (RPO).

For a virtualization infrastructure, Infortrend and Veeam provide fast, flexible and reliable backup and recovery of virtualized applications and data. Backup and replication are unified in a single solution, which increases the value of backup and reinvents data protection.

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