Vembu

Evaluator's Guide for VMware Backup

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Table of contents

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Evaluator's Guide for VMware Backup

Introduction

Vembu VMBackup (Part of Vembu BDR Suite) is a comprehensive data protection and disaster recovery solution designed to meet the needs of virtualized data center for SMBs and Enterprises. Users with VMware and Hyper-V data center environment can now provide their data centers the utmost protection they deserve with Vembu VMBackup. Optional Cloud Disaster Recovery provides the ability to have data redundancy and disaster recovery in the event of data center downtime.

Evaluator's Guide for VMware Backup

System Requirements

Evaluator's Guide for VMware Backup

Minimum Configuration

BDR Backup Server	
OS	• Microsoft Windows Server 2012 R2 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2016 • Linux Ubuntu LTS 12.04 • Linux Ubuntu LTS 14.04 • Linux Ubuntu LTS 16.04
Instant Boot Infrastructure	• VMware vSphere • Microsoft Hyper-V • KVM Hypervisor
Memory	8 GB
CPU	Quad Core Xenon Processor
Meta Data Storage	10% of the planned total backup data size
Network Card	1 Gbps & above
Browser	• IE v11 • Firefox v28 & above

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	• Chrome v34 & above

Recommended Configuration

BDR Backup Server	
OS	• Microsoft Windows Server 2012 R2 • Microsoft Windows Server 2008 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2016 • Linux Ubuntu LTS 12.04 • Linux Ubuntu LTS 14.04
Instant Boot Infrastructure	• VMware vSphere • Microsoft Hyper-V • KVM Hypervisor
Memory	16 GB
CPU	Octa Core Dual Processor
Meta Data Storage	10% of the planned total backup data size
Network Card	1 Gbps & above
Browser	• IE v11 • Firefox v28 & above • Chrome v34 & above

Back to System Requirements

Evaluator's Guide for VMware Backup

Supported Plaftorms

- Following are the Virtual infrastructure platforms supported by Vembu VMBackup, with their respective supported versions listed:

Virtual Infrastructure	Version
Platform	• VMware vSphere 6.0 • VMware vSphere 5.x • VMware vSphere 4.x
Hypervisor	• ESX(i) 6.0 • ESX(i) 5.x • ESX(i) 4.x
Management Server	• vCenter Server 6.0 • vCenter Server 5.x • vCenter Server 4.x

- Following are the virtual machine specification and requirement supported by Vembu

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VMBackup:

VM Specification	Requirement
Virtual Hardware	• Virtual hardware of all types and versions are supported, which includes support to virtual disks larger than 2 TB. (i.e) Support extends upto recent addition- 62TB VMDK. • VMware does not support snapshotting VMs with disks engaged in SCSI bus sharing; Such VMs are not supported by Vembu VMBackup. • RDM virtual disks in physical mode, Independent disks, and disks connected via in-guest iSCSI initiator are not supported, and are skipped from processing automatically. Network shares and mount points targeted to 3rd party storage devices are also skipped as these volumes/disks are not visible in the VM configuration file.
OS	• All VMware supported operating systems. • Application-aware processing support from Microsoft Windows 2003 SP1 and later.
Software	• VMware Tools (optional). VMware Tools are required for following operations: application-aware processing and file-level restore from Microsoft Windows guest OS. • All latest OS service packs and patches (required for application-aware processing)

Back to System Requirements

Evaluator's Guide for VMware Backup

Port Configuration

Port	Use
TCP Port 32004	For processing Backup/Restore/Delete/ Replication requests
HTTP Port 6060, 6061	For processing WebService requests
TCP Port 32005	For UI Communication
HTTPS TCP 443	For Esx(i) Communication
TCP Port 902	Data Transfer to ESX(i) host

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Back to System Requirements

Evaluator's Guide for VMware Backup

Naming Conventions

Any backup and replication job created in Vembu BDR should be named with below mentioned rule:

- Only [a-z][A-Z][0-9][- _] characters are allowed in Backup/Replication Name.

Also do not use the following reserved names for naming any backup/replication job: CON, PRN, AUX, NUL, COM1, COM2, COM3, COM4, COM5, COM6, COM7, COM8, COM9, LPT1, LPT2, LPT3, LPT4, LPT5, LPT6, LPT7, LPT8, and LPT9.

To learn more about file/folder naming restrictions in Microsoft Windows, do read the naming conventions column from below link:
Naming Conventions - Microsoft

Back to System Requirements

Evaluator's Guide for VMware Backup

Target/Source Host Permissions

- Root permissions on the source ESX(i) host.
- Root or equivalent permissions on the Linux backup repository.
- Write permission on the target folder and share.
- If VMware vCenter Server is added to the backup infrastructure, an account that has administrator permissions is required. Instead of granting administrator permissions to the account, you can configure more granular permissions.

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Scalability and Infrastructure Sizing

The performance parameters are dependent on the following variables:

- BDR Backup Server System Configuration – CPU, RAM etc
- Storage target's throughput and the Network TCP/IP performance
- The data transfer rate from ESXi Hosts & Hyper-V Hosts while performing the VM backup to the BDR Backup Server

In this segment, we will be discussing the recommendation and sizing information of:

1. BDR backup server
2. Database storage
3. Storage Repositories

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Vembu BDR Backup Server

The Vembu BDR backup server is a centralized management server and it handles:

- All communications (such as Backup, Replication and Restore) with VMware vCenter Servers, ESXi hosts and Microsoft Hyper-V hosts
- Storage Targets
- Web based GUI to manage backup and all other activities
- Creating Backup, Replication Jobs and managing them
- Collects Backup and other activity logs to generate comprehensive reports
- Performing restore related use cases

BDR backup server can be installed on a physical or virtual machine. Vembu BDR Installer will install the missing/required packages along with Vembu BDR backup server.

Vembu BDR backup server communicates with the VMware vCenter Server, ESXi host and Hyper-V host to gather the VM data which needs to be backed up.

System Requirements:

OS	Microsoft Windows Server 2016 Microsoft Windows Server 2012 R2 Microsoft Windows Server 2012 Microsoft Windows Server 2008 R2 Linux Ubuntu LTS 12.04 Linux Ubuntu LTS 14.04 Linux Ubuntu LTS 16.04
RAM	8 GB (Minimum) and 16 GB (Recommended)
CPU	4 cores or 4 vCPUs (Minimum) and 8 cores or 8 vCPUs (Recommended)
Network	1 Gbps & above. While replicating the on-site copy over WAN, 1 Mbps & above

The performance of the VMware and Hyper-V backups depends on the RAM & CPU availability of the BDR backup server. Normally, 4 GB RAM will be utilized to run the BDR backup agent and databases services. Then additional memory will be utilized for each backup jobs. If only one backup job is active, then it will use remaining memory (ie., approx. 4 GB RAM). If two concurrent backups are active, then each backup job will use approx. 2 GB RAM. So, the memory utilization will be divided based on active concurrent backup jobs.

We recommend to keep approximately 500 MB RAM for each active backup job. If you want to run 8 concurrent backup jobs in your BDR backup server, you should assign 8 GB RAM (4 GB for BDR backup server and 4 GB to process the backup jobs).

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NOTE: *Each backup job can have multiple VMs. For example, if you want to backup a ESXi host or Hyper-V host which have 10 VMs respectively, you can select the entire host as a one backup job. So, during backup VM data will be backed up one by one.*

In order to avoid significant CPU usage during active backup progress, BDR backup server machine should be assigned with enough vCPUs or cores. Normally one vCPU or core is enough to handle around 8 concurrent backup job's activity (such as read/write). However, we recommend to assign minimum of 4 cores/vCPUs for hassle free usage.

NOTE: *Above mentioned memory and CPU utilization are same for the BDR backup server (Windows & Ubuntu) deployed in physical and VM environment.*

DataBase Storage

Make sure you have 10% free space available in the DB metadata storage target. For example, if you want to backup VMs with 2TB used data. After storage reduction, approximately 1TB data will be stored at storage targets. In this scenario, approximately 100GB free space would be required to store the metadata files.

Storage Repositories

You can use any NAS, SAN and directly attached storage devices to store the backed up data. There are no limitation with any hardware vendor. So, we never recommend any specific hardware vendor.

Vembu uses it's own filesystem VembuHIVE on storage targets. This file system is a application level file system which works on top of any existing file system. It has inbuilt,

- Compression
- Encryption (AES 256 Bit encryption algorithm)
- Deduplication (Block level deduplication applied in each backup job)
- Version controlling (Advanced forward & reverse incremental)

The performance of the backup job depends on the IOPS. So, you will get better backup performance, if you have higher IOPS.

NOTE: To calculate the required storage space for your environment, use Vembu storage calculator.

Vembu VMBackup Sizing Table

The following tables illustrate how the VMware & Hyper-V backup performance parameters change depending upon the average data transfer rate.

Underlying Assumptions:

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- The average data transfer rate is the effective upstream data transfer rate at which the VM data (VMware & Hyper-V backup) is sending data to your onsite BDR backup server.
- Each VM (VMware & Hyper-V) transfers approx. 50 GB of incremental data every day.
- The estimates provided below are not 'stretch estimates'; they are safe estimates and are more pessimistic than optimistic. Typical bottlenecks you should look out for are:

    - Bandwidth bottlenecks
    - Slowing down of data transfer due to low performance switches/routers, etc
    - Hard disk write speeds at the storage targets
    - CPU utilization by other non related processes running on the BDR backup server

Sizing Tables:

BDR Backup Server Configuration

OS	:	Windows 2012 R2 DC (Physical Machine)
RAM	:	16 GB
CPU	:	Intel XEON CPU 2.10 GHz (4 cores)
Network	:	1 Gbps
BDR Version	:	v3.7.0

Backup Environment

Hypervisor	:	VMware vSphere
No of VM	:	1
VM data	:	2 TB

Backup Type	VM Data Size	CPU Utilization	Memory Consumed	Total time taken to complete the backup	Transfer rate
Full Backup	2 TB	22 %	3145 MB	383 Mins	803 Mbps
Incremental	55 GB	16.5 %	401 MB	11 Mins	751 Mbps

Backup Environment

Hypervisor	:	Microsoft Hyper-V
No of VM	:	1
VM data	:	2 TB

Backup Type	VM Data Size	CPU Utilization	Memory Consumed	Total time taken to complete	Transfer rate

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				the backup	
Full Backup	2 TB	9 %	3123 MB	565 Mins	544 Mbps
Incremental	37 GB	16.5 %	462 MB	11 Mins	502 Mbps

The above measurements are taken for one backup job with one single VM. So, if multiple concurrent backup jobs are active then it will share the memory and CPU. As stated earlier, approximately each backup job will require 500 MB RAM.

It is important to note that there are no inherent scalability restrictions for a BDR backup server when it comes to the maximum number simultaneous backups possible. If a larger number of backup jobs are simultaneously configured to a BDR backup server, then the only effect will be that there will be a corresponding degradation of performance in terms of time taken to complete the backup for all the backup jobs.

A larger backup window and/or a lower time per average backup per backup job will obviously translate into a higher "Maximum Number of VMs Supported by a Single BDR backup server". For example, the above illustration assumes that backups are typically scheduled during 'non office hours' (hence the 10 hour window); this is not always the case. Especially, if in case the backups can happen non-intrusively in the background while users do their regular work.

An Important Note On Storage Device Throughput And Concurrent Writes:

Throughput of Storage devices (IDE/SCSI/SAS/NAS/SAN) are normally benchmarked based on maximum throughput achieved while performing sequential writes into the device. But when multiple VM backups are backing up simultaneously to the BDR backup server, then the BDR backup server will be concurrently writing the different files for different VMs onto the Storage device.

Hence for a given configuration (CPU, RAM, bandwidth), BDR backup server's performance will ultimately depend upon the BDR backup server's throughput of the Storage device when concurrent writes are being done from multiple threads.

The reason Storage devices do not perform well when multiple threads are writing to it concurrently is that the I/O seek that has to be done between writes from different threads can slow down the performance significantly. Hence it is imperative that the Storage device used to backup the data is of the highest quality and has the ability to scale and perform well when 100s of different threads write to the storage device concurrently.

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Backup Components

- BDR Backup server

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- Storage Repository
- Vembu Universal Explorer

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BDR Backup Server

Vembu BDR backup server is a Windows/Linux based server machine that can be installed as a service and works flawlessly on both (physical and virtual) environments. It serves the major contribution to users with handful of features such as:

- Quick VM recovery
- Restore processes
- VembuHIVE File System
- Backup storage management, compression/encryption and 4-tier verification

Back to BDR Components List

Evaluator's Guide for VMware Backup

Storage Repository

Vembu BDR repository management has a hybrid volume manager that supports scalable and extendable backup storage of different storage media such as Local drives, NAS(NFS and CiFS) and SAN(iSCSI and FC).

VembuHIVE™

Vembu's patented document-oriented backup data repository. Having replaced all structural file system metadata with content metadata and intelligently indexed each document, Vembu is able to virtualize VembuHIVE™ as a file system, with respect to backup documents.

Back to BDR Components List

Evaluator's Guide for VMware Backup

Vembu Universal Explorer

Vembu universal explorer is a single recovery tool that lets a user to granularly recover data from the various Microsoft application backups such as: Exchange, SQL, SharePoint and Active directory.

- User can perform granular restore of emails/mailboxes/exchange stores from Microsoft Exchange
- User can perform granular restore of Microsoft SQL databases and tables
- Supports document level restore for Microsoft SharePoint

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- Supports granular recovery for Microsoft Active Directory

Back to BDR Components List

Evaluator's Guide for VMware Backup

Installation

- BDR Backup Server - Windows
- Vembu Universal Explorer
- Uninstalling Vembu BDR Server

Evaluator's Guide for VMware Backup

BDR Backup Server - Windows

Vembu BDR Server is currently supported for below versions of windows machines (Please make sure that you are using any one of the below versions).

- Windows Server 2012 R2 (64 Bit)
- Windows Server 2008 R2 (64 Bit)
- Windows Server 2012
- Microsoft Windows Server 2016

Download build:

- Download the Windows Installer for Vembu BDR server.

Steps to Installation:

- Run the downloaded installer with administrator privilege and installation process begins with the below wizard. Click Next to proceed with installing the setup.

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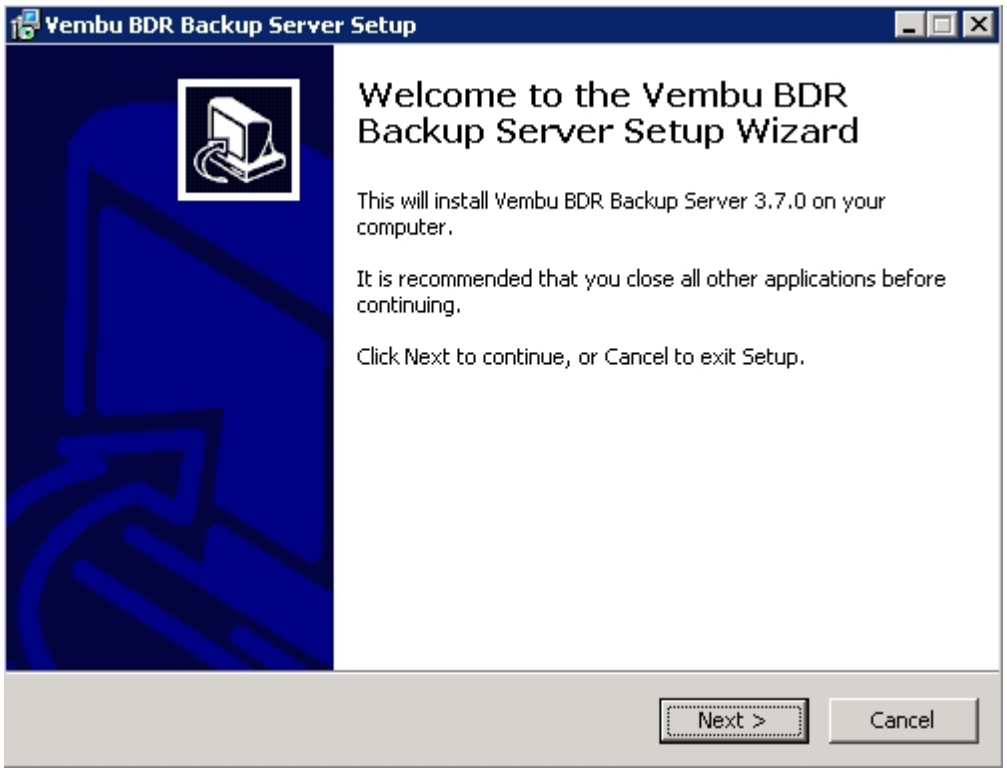
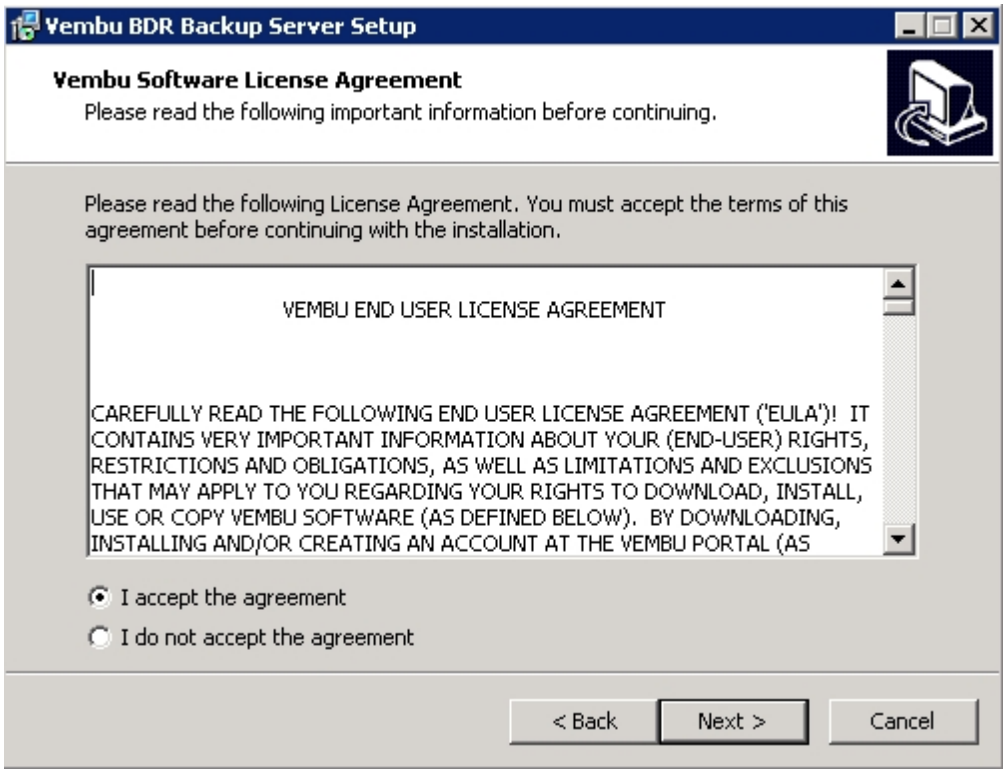


- 'Vembu BDR License agreement' is the next step in setup installation, read the agreement carefully and choose 'I accept the agreement' option.
  Note: Opting to 'I do not accept the agreement' will block you from proceeding with setup installation.
- Click Next



- Next step in wizard will have default settings chosen, you can either:

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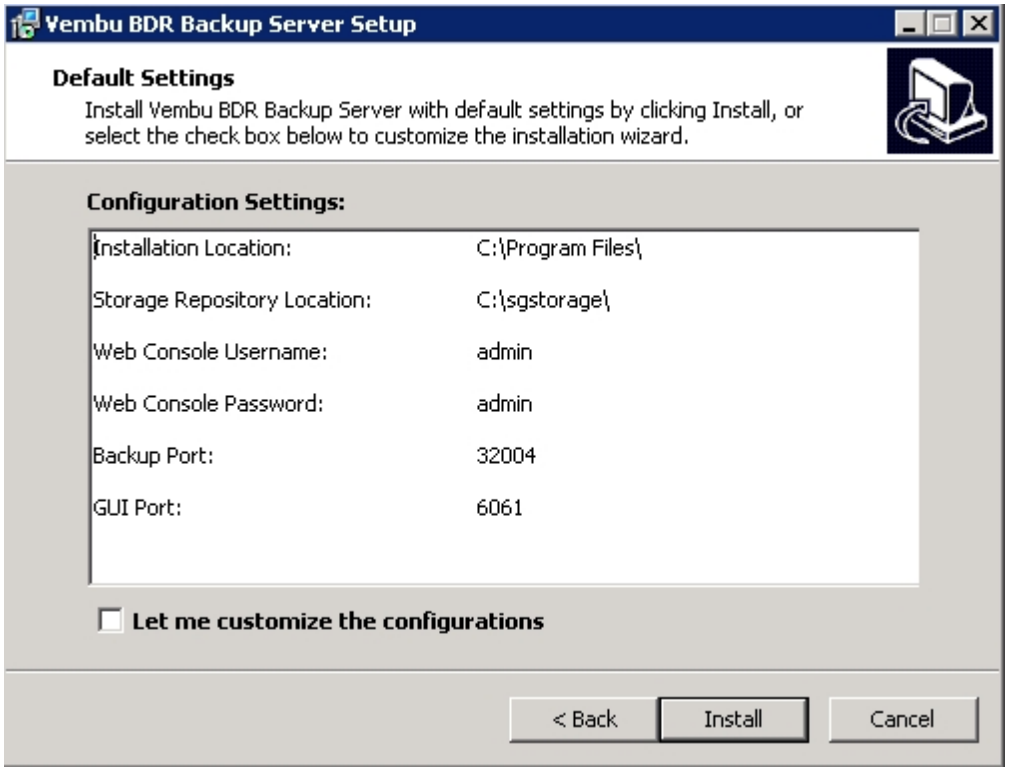
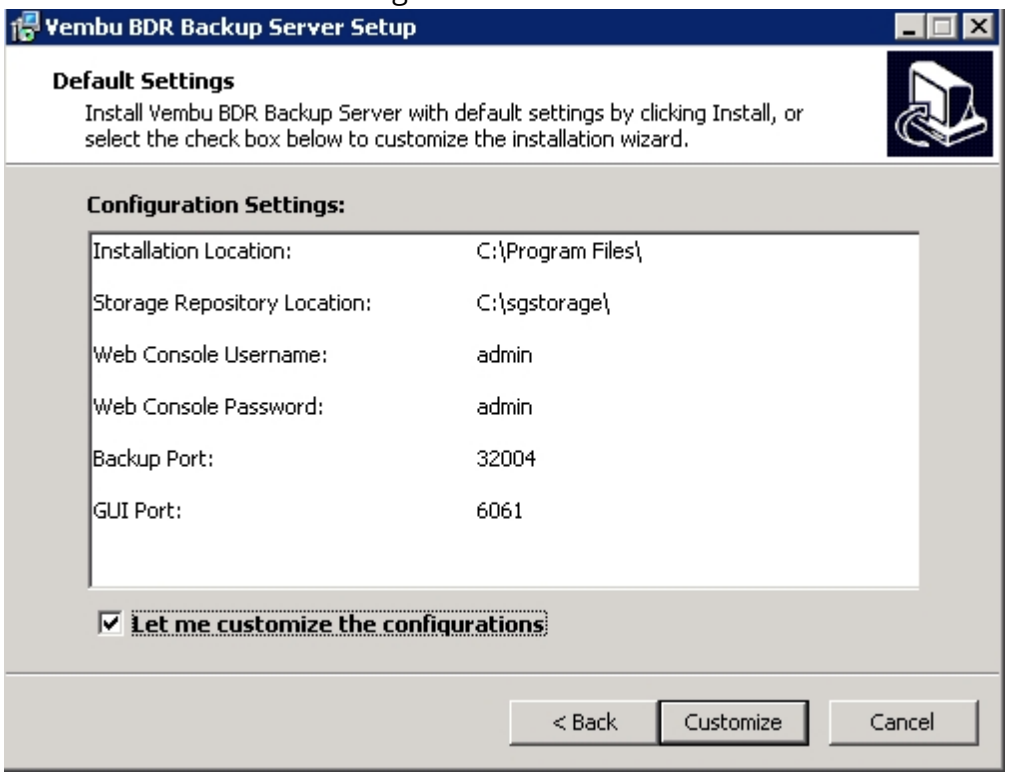
- Click Install to proceed installation with default chosen settings.



- Or can check 'Let me customize the configurations' option and opt to Customize settings.



- Choosing Customize option will let you customize PostGreSQL Server Configurations in next step: 'Installation location' and 'Database Storage Location'.
- Once done choosing location, click Next.

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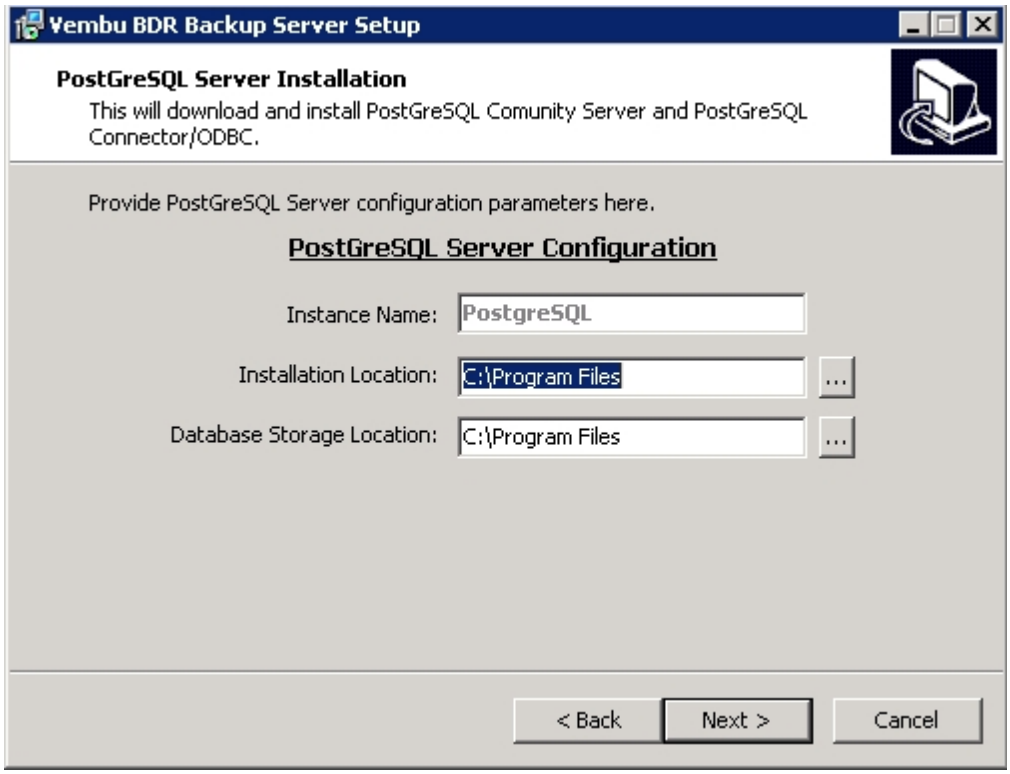
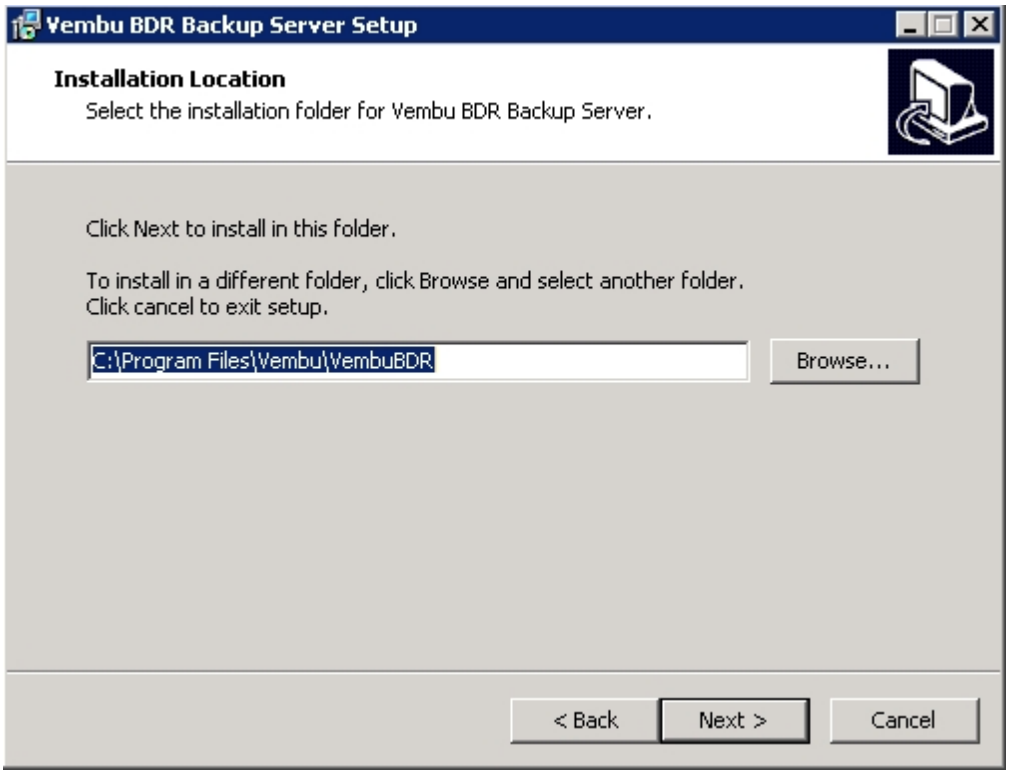


- Next step in wizard will allow you to customize installation location of Vembu BDR.
- Once done choosing location, click Next.



- Next step in wizard is 'Storage Repository Configuration', you can either choose:
    - A local drive as your storage repository

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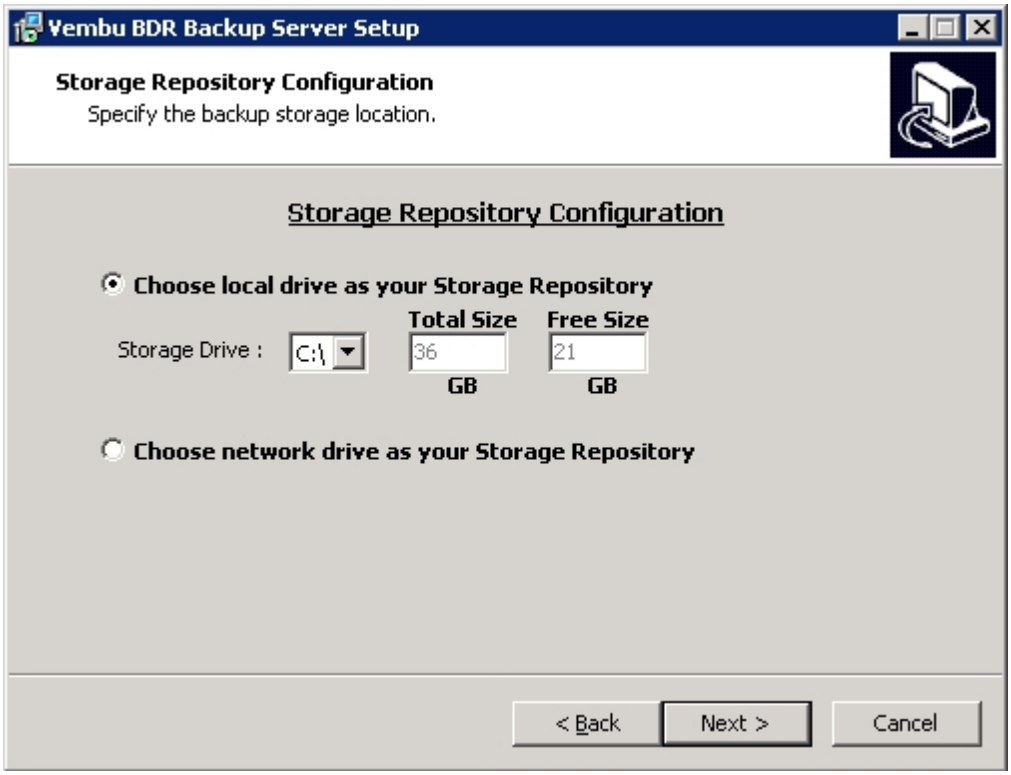
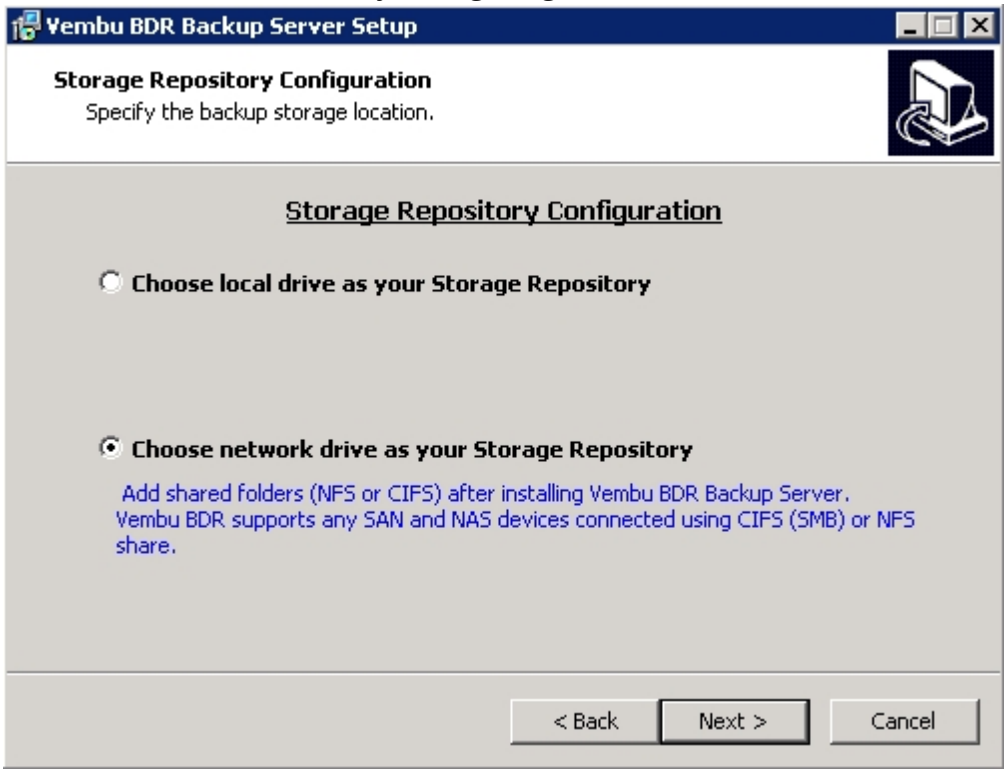


- Or choose a network drive as your storage repository
- Once done with Vembu BDR server installation, you can add shared folders as network drives by configuring them via Vembu BDR server web console.



- Click Next.

- Next step in wizard will allow you to configure:
  - User credentials for WebConsole (Default user name: admin and password:

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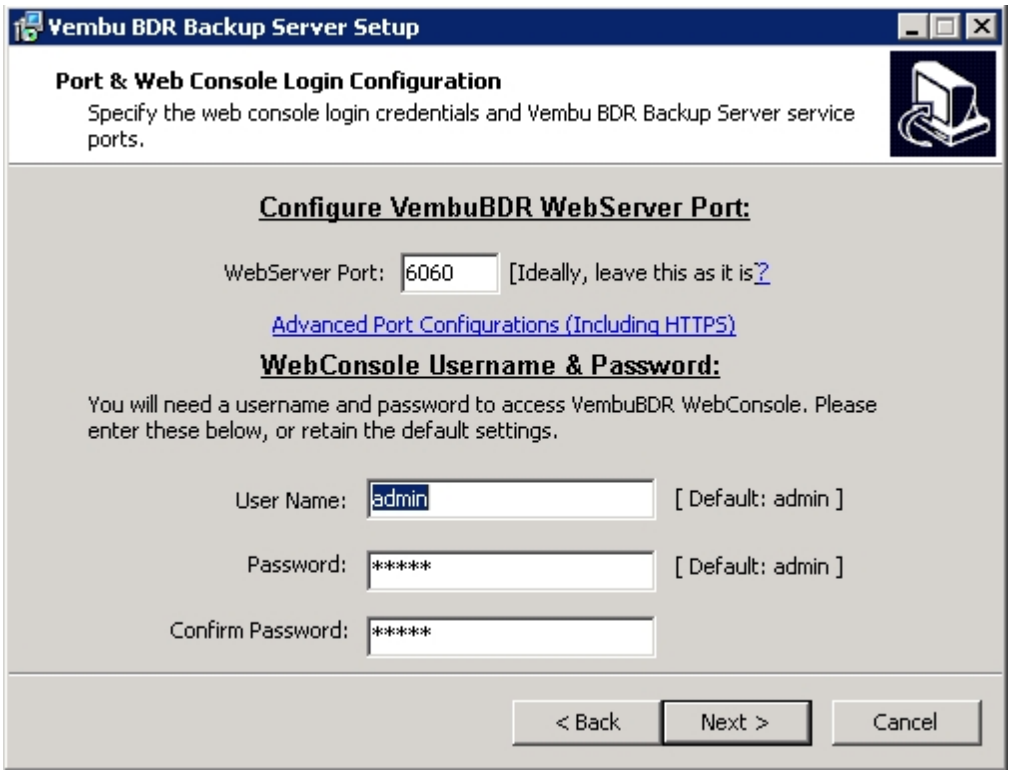
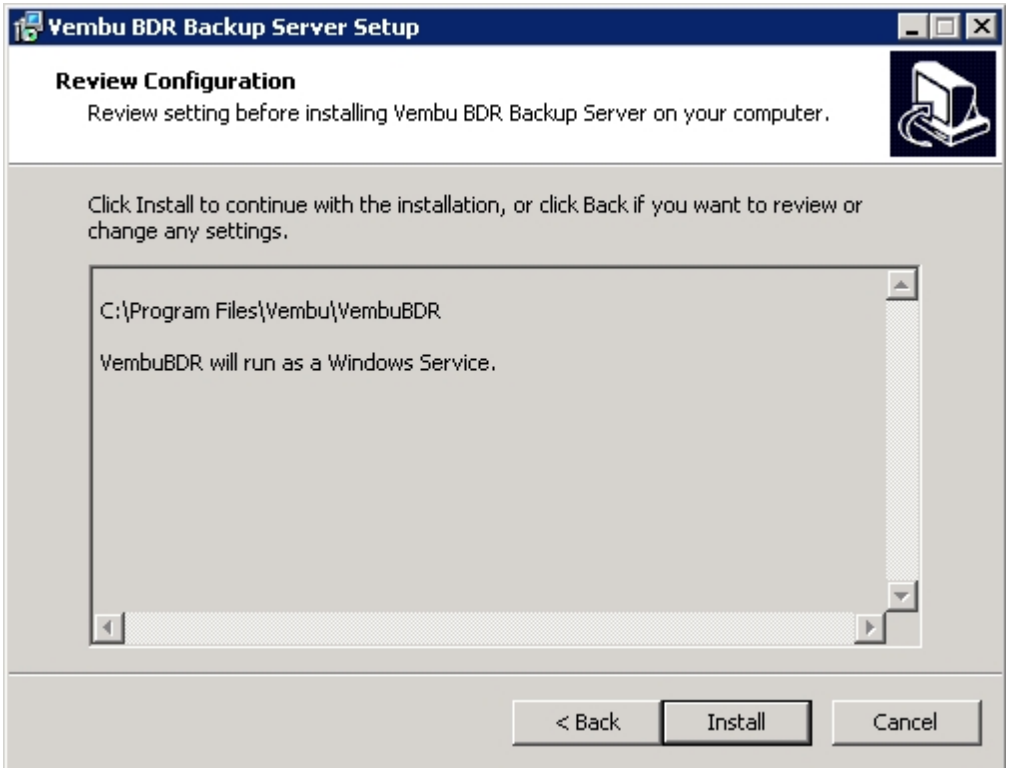
admin)

- WebServer port (Default port chosen will be 6060 and it is recommended not to change it unless you are advanced user)

- Once done, Click Next.



- Next step of Wizard will allow you to review the chosen configuration, review the settings and proceed to click Install.



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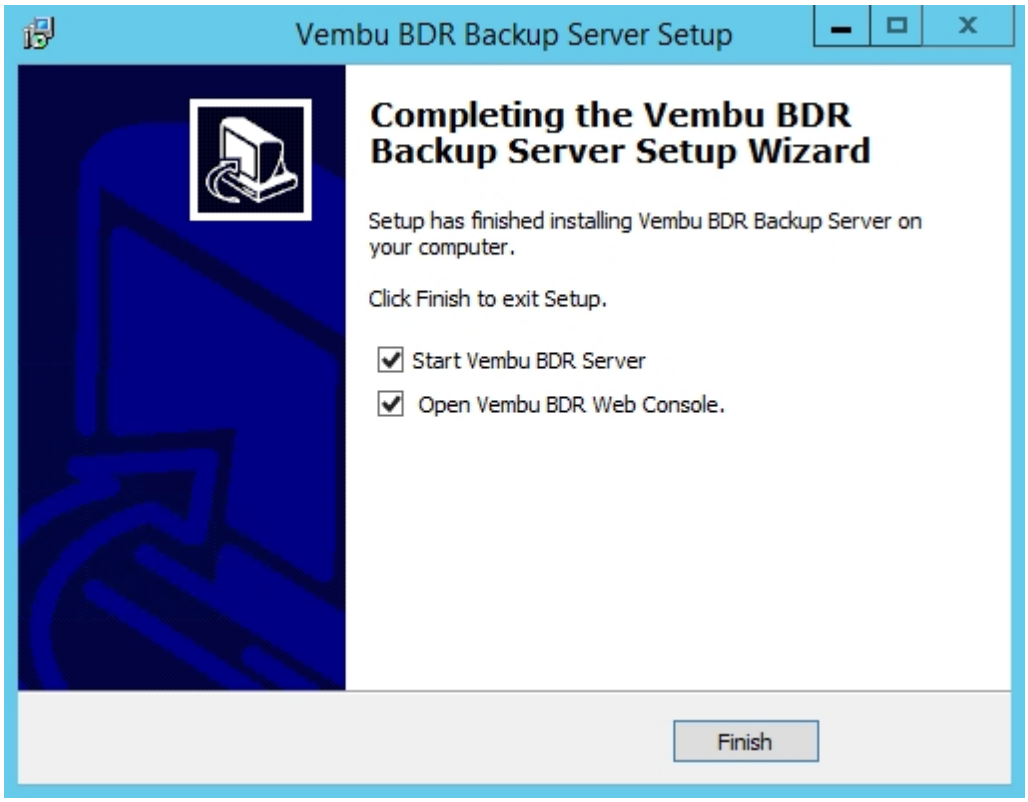
- Final step of wizard after installation will ask you whether to:
  - Start Vembu BDR server and
  - Open Vembu BDR Web Console.
- You can either leave the options selected and click Finish. Or chose to UnCheck them and start later.



Note: VembuBDR is installed as a service and can be found on Services.msc, if user chose to start later.

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Vembu Universal Explorer

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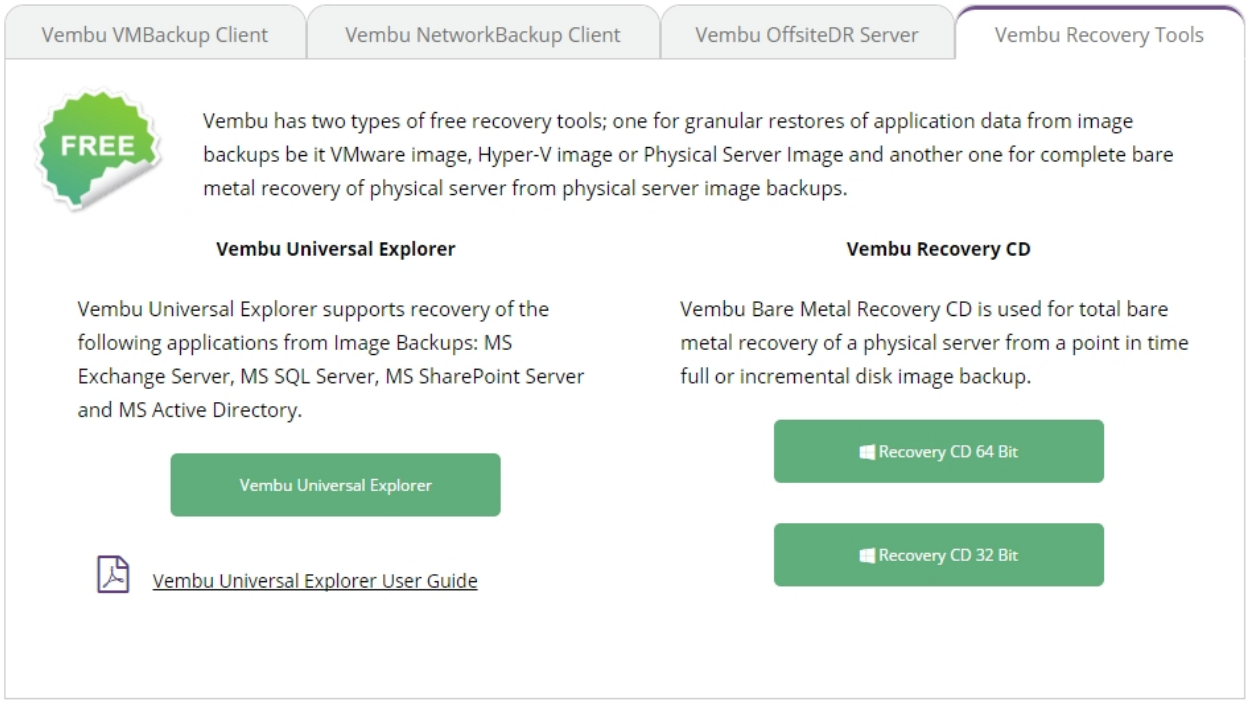

Download build

Download the installer file for Vembu Universal explorer.

Steps to Installation:

- Run the downloaded installer with administrator privilege and installation process begins with the wizard below. Click next.

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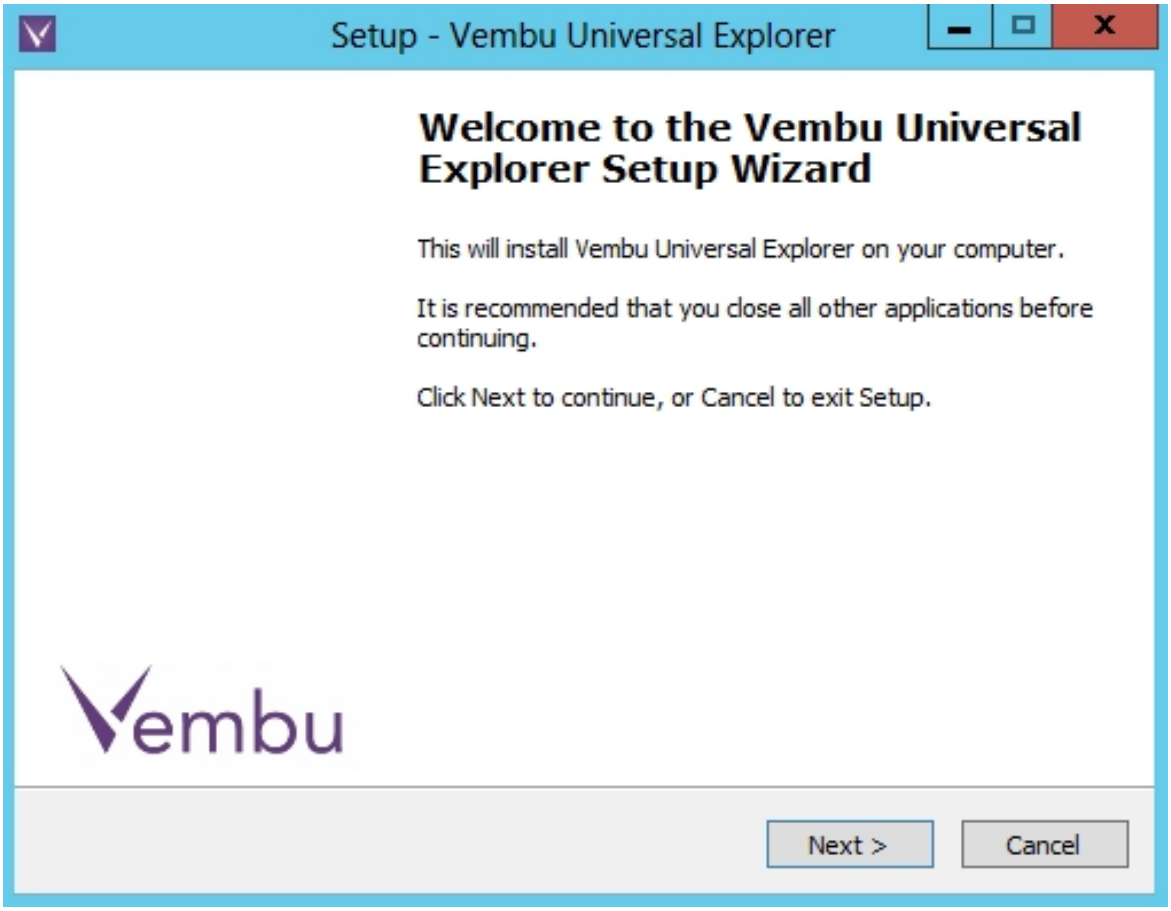

- The next window will check for the pre-requisites installation in your machine and lists them along with download link for applications that are uninstalled.
- You can either download them right away, or check the 'I will install prerequisites later' checkbox for installing them later.

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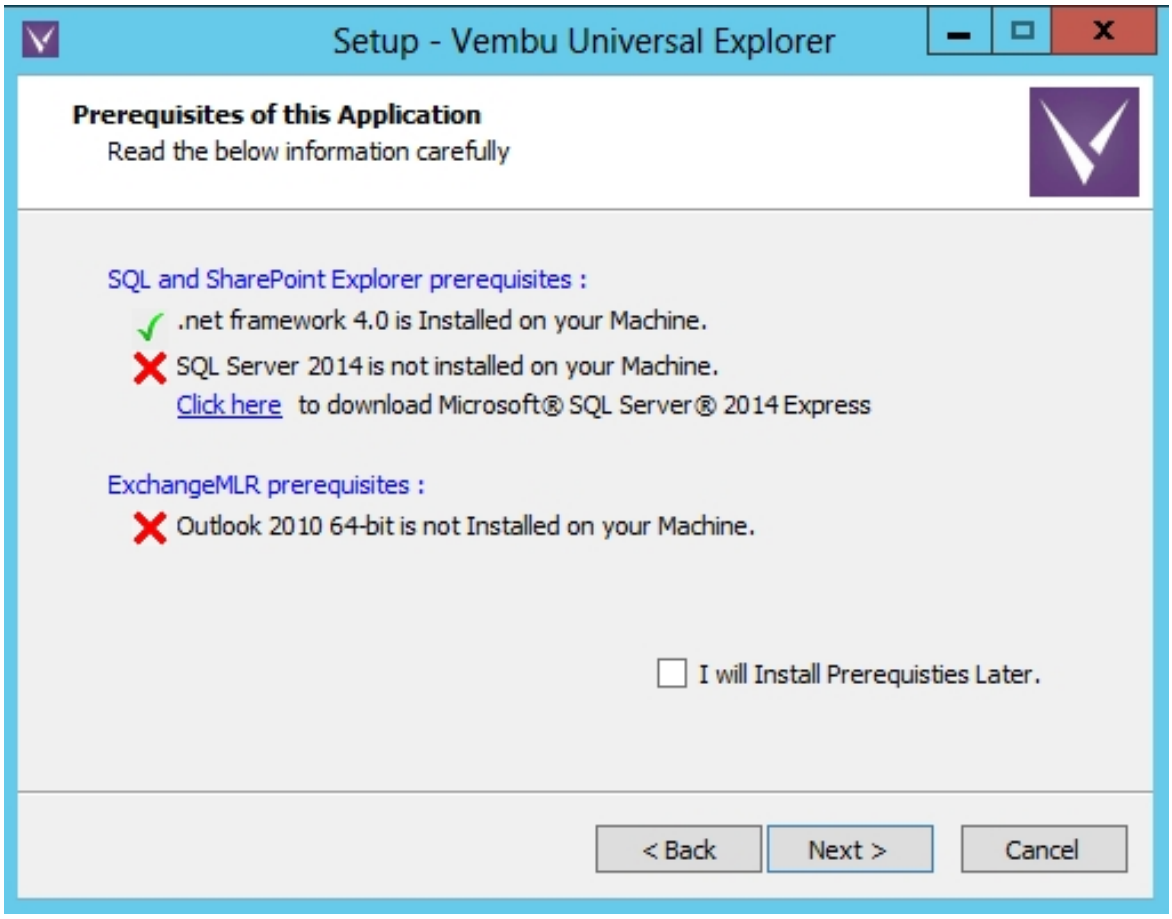

- Read and agree to Vembu Software license agreement and click Next.

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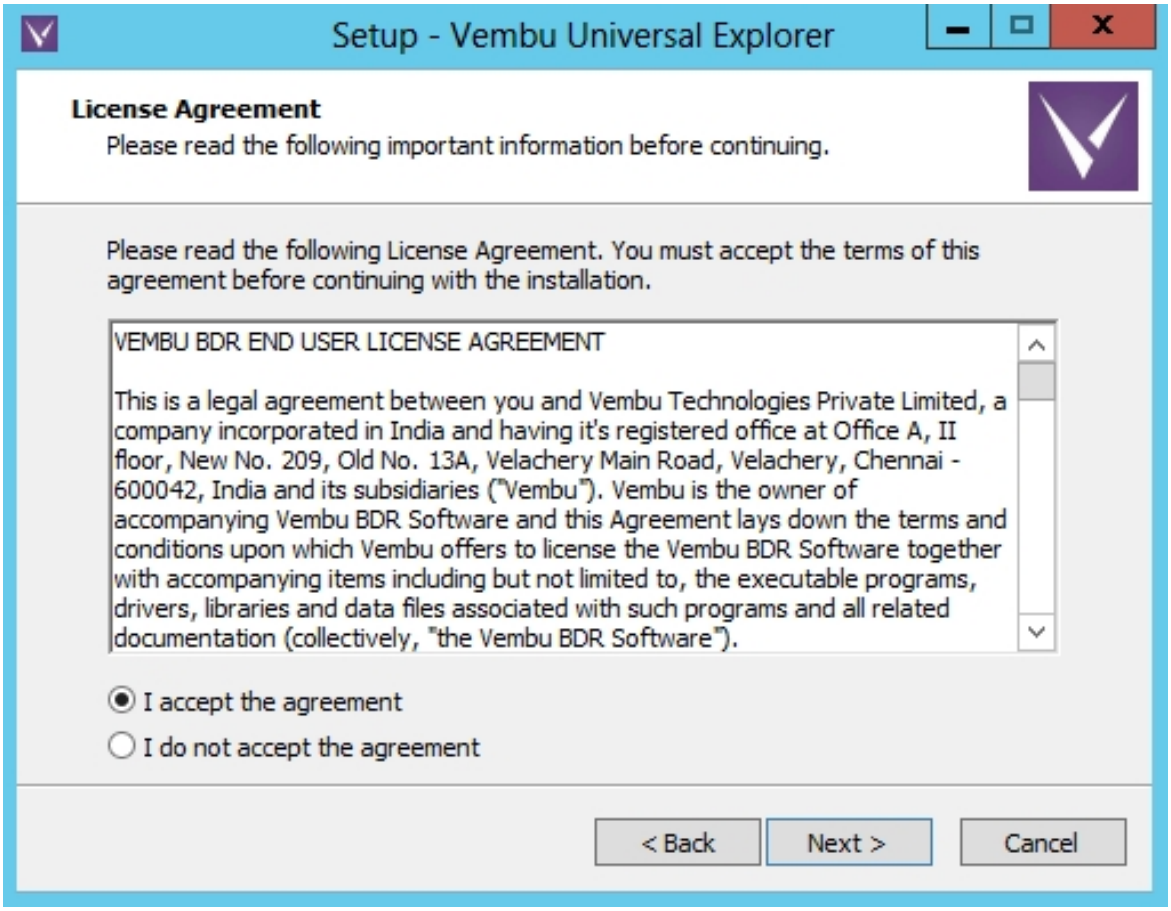

- Following wizard will ask for folder name under which setup will add program icons to the folder. In the next page, choose whether you need shortcut and quick launch icons for the program and proceed.
- Next wizard will give a summary of provided details, review it and proceed with installing Vembu Universal Explorer.

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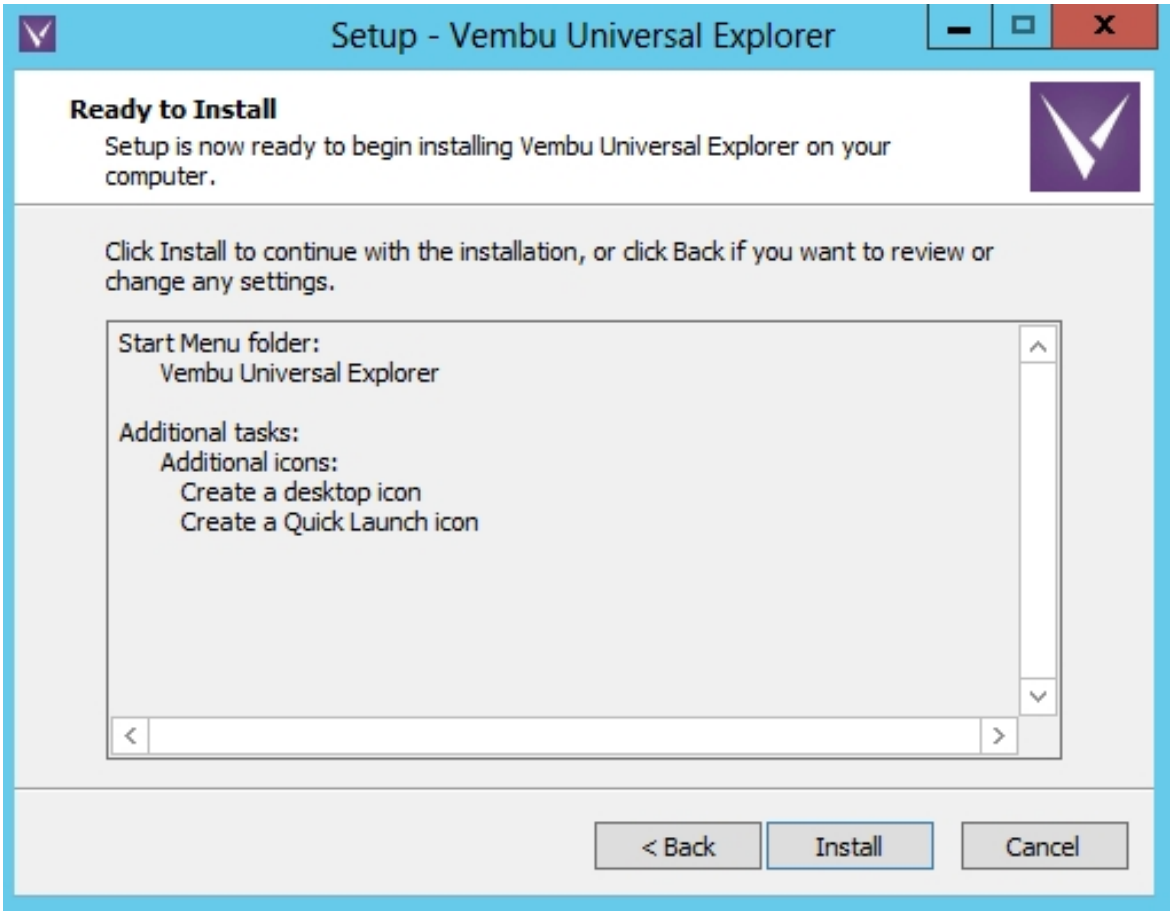

Evaluator's Guide for VMware Backup

Uninstalling BDR Backup Server

For clean uninstallation of Vembu BDR server in Windows machines, follow the below steps:

- Run the downloaded installer file for Vembu BDR and click Next in the below wizard to proceed with clean uninstallation process.
  Note: uninstallation process will happen only if Vembu BDR is already installed. If not the installer file will proceed with installing Vembu BDR and its prerequisites.

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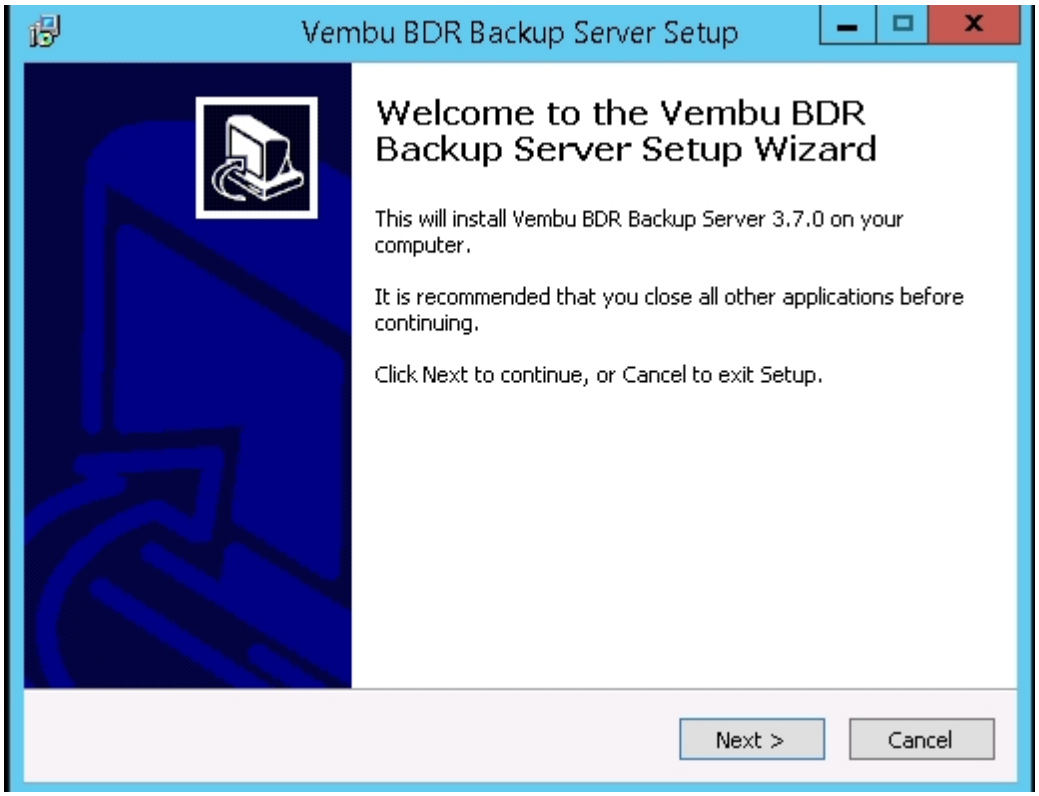
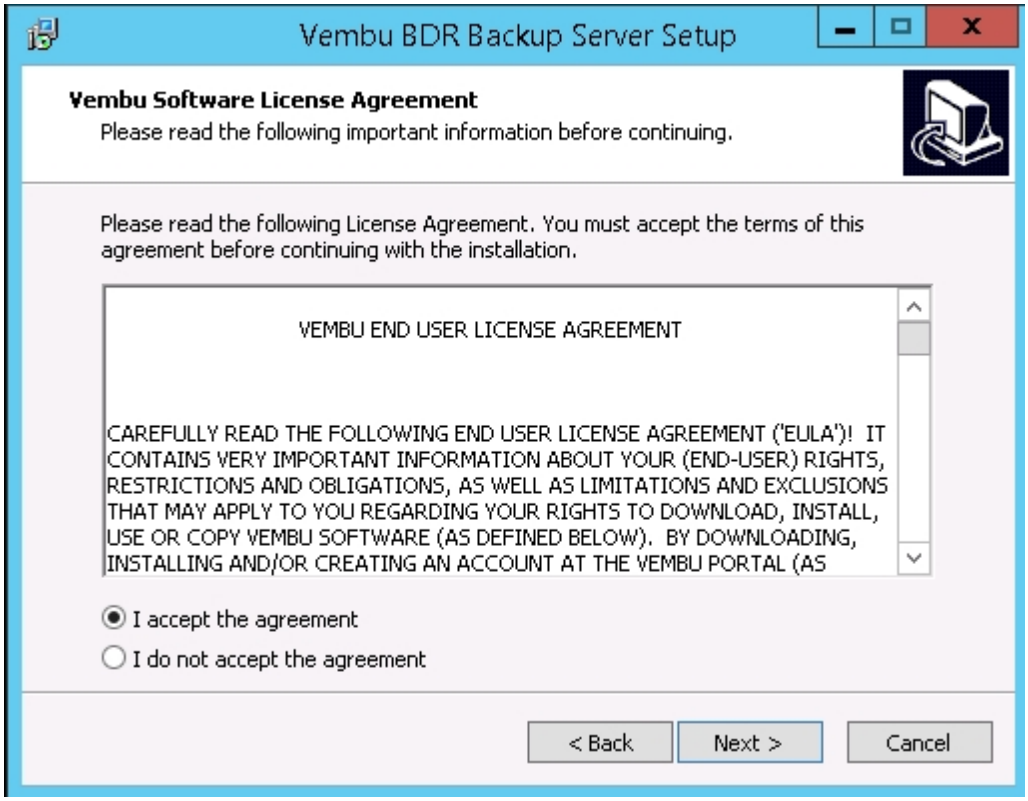


- 'Vembu BDR License agreement' is the next step, read the agreement carefully and choose 'I accept the agreement' option.
  Note: Opting to 'I do not accept the agreement' will block you from proceeding with uninstallation.
- Click Next



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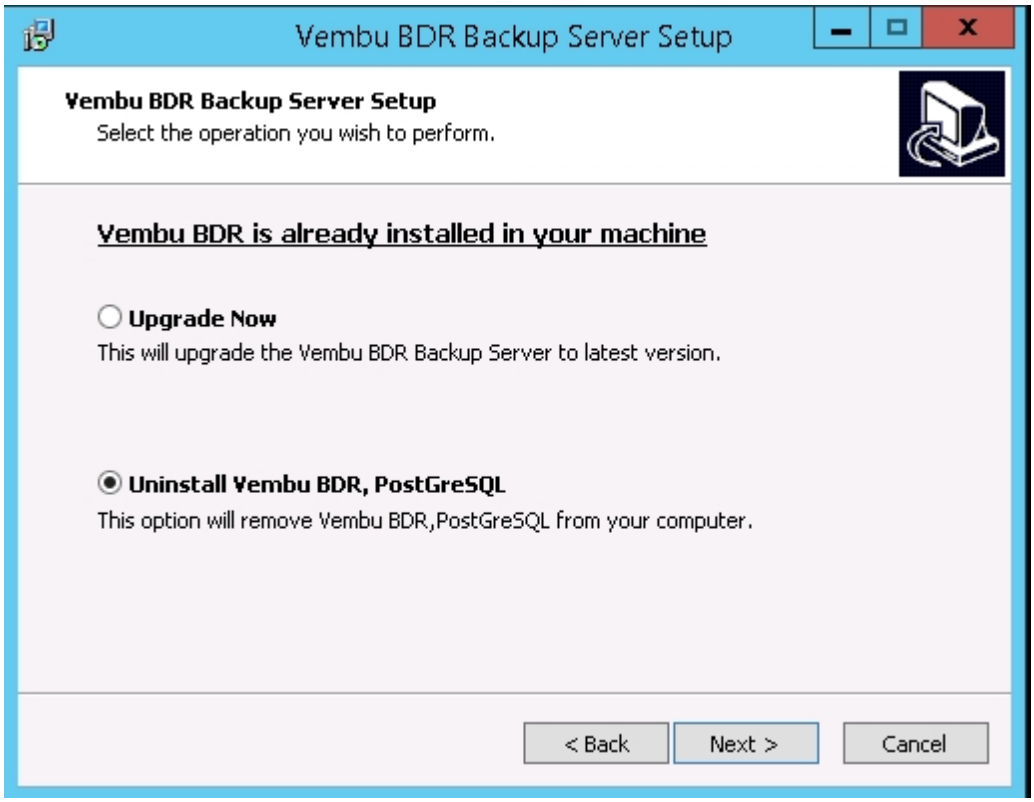
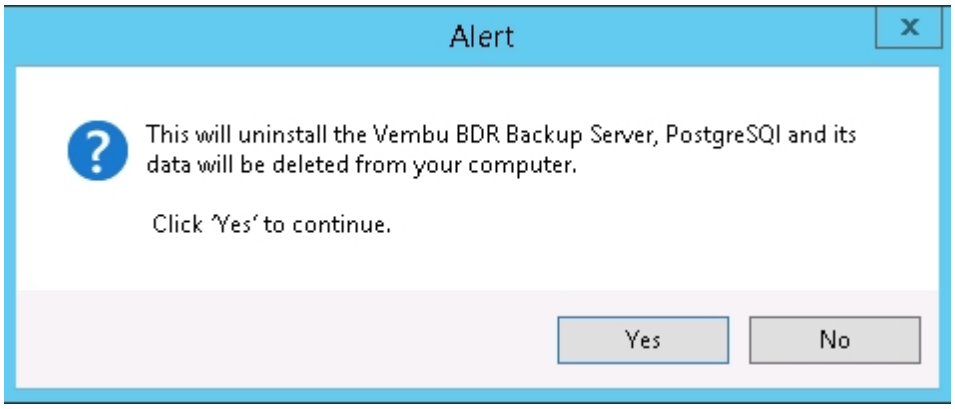
- The next step in wizard will ask you to choose between 'Upgrade Now' and 'Uninstall Vembu BDR, PostGreSQL'.
- To proceed with uninstallation choose the latter option: 'Uninstall Vembu BDR, PostGreSQL' and click Next.



- A pop-up with a alert message will show up, click 'Yes' to proceed.



- Uninstaling Vembu BDR and its requisite softwares(PostGreSQL) will begin.

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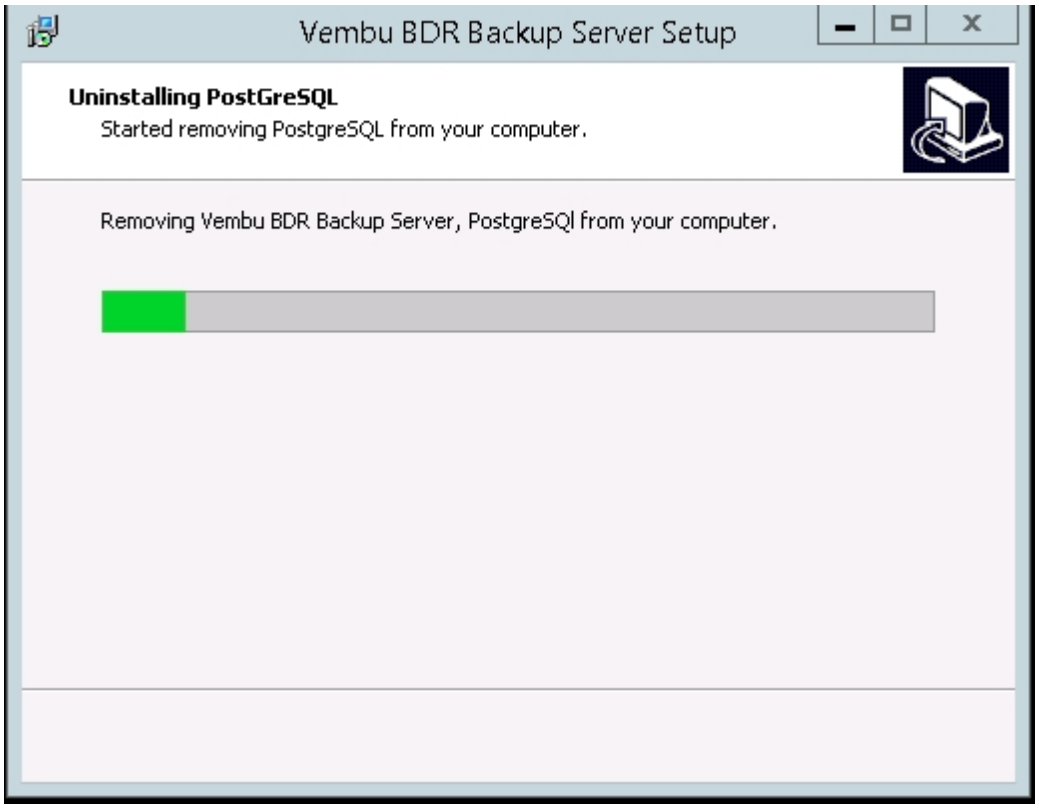
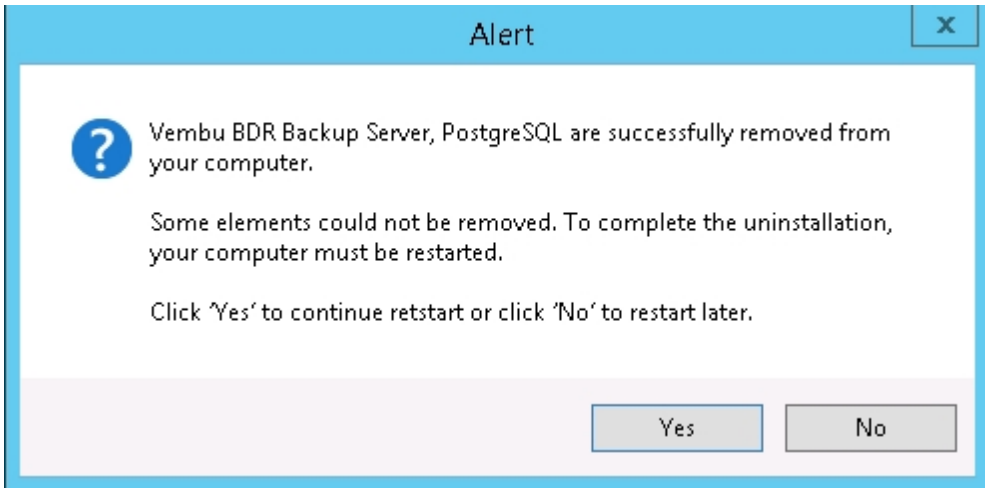


- Once Vembu BDR and its prerequisites are removed, you will be requested to restart the machine to complete the uninstallation process. Choose 'Yes' to restart immediately or 'No' to manually restart later.



Evaluator's Guide for VMware Backup

Login to Web GUI - Vembu BDR

- User can login to Vembu BDR web UI via following options:
  - By typing the following URL: https://localhost:6061 (or)https://<Ip_Address_of_Machine>:6061 in browser.
  - Via shortcut created on desktop.

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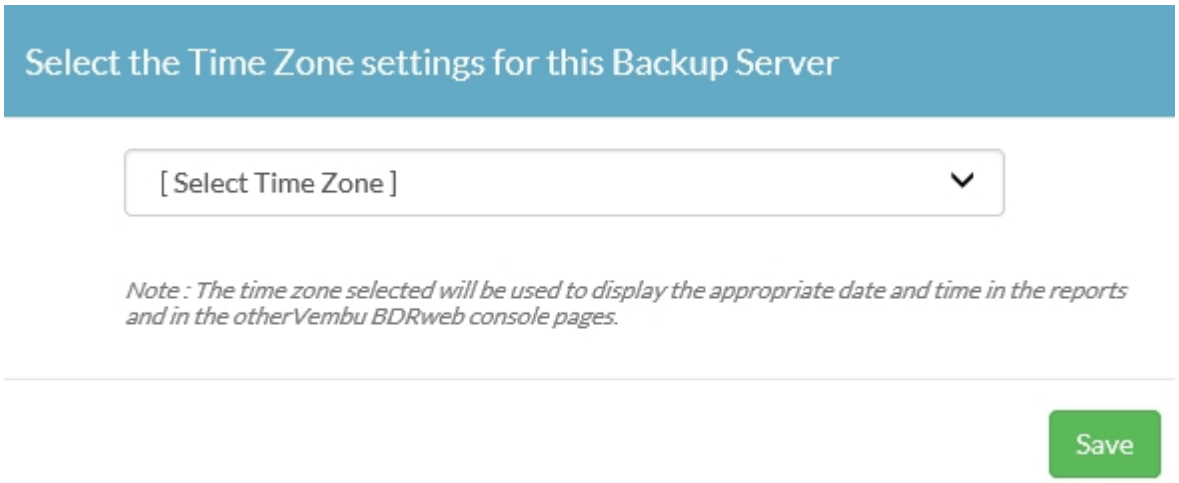
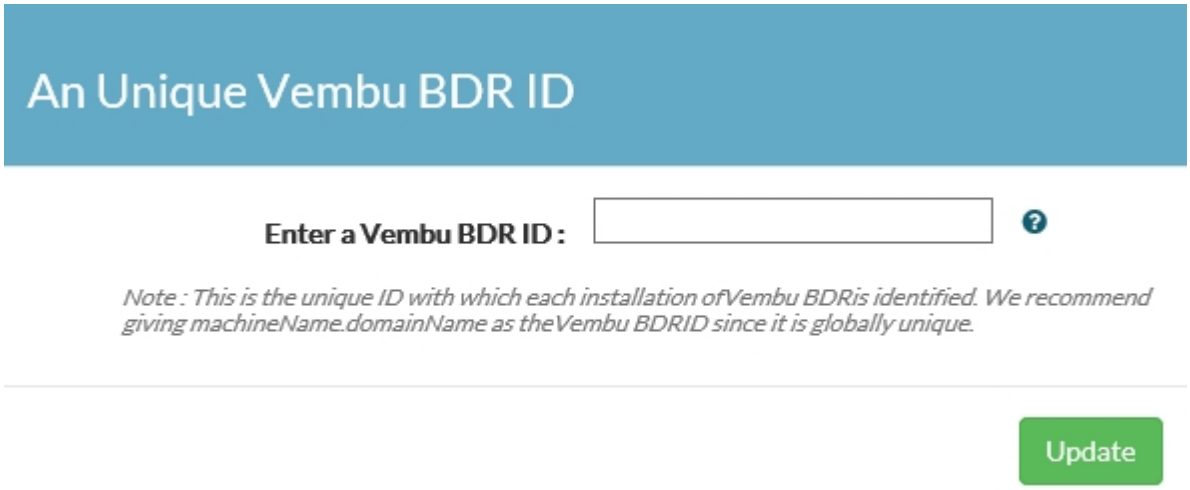
- Via Vembu BDR server web console option in tray icon.

- Users who login after a fresh installation will be required to choose the time zone in which they want their backup/replication reports to be generated.



- Once done choosing time zone, you will be required to provide Vembu BDR ID which should be globally unique.
  Note: We recommend users to give machineName.domainName as Vembu BDR ID since it is globally unique.



- Once done assigning ID for Vembu BDR, you will be directed to job listing page.

Since it is a fresh installation with nil backup/replication jobs configured, the page will look like picture below:

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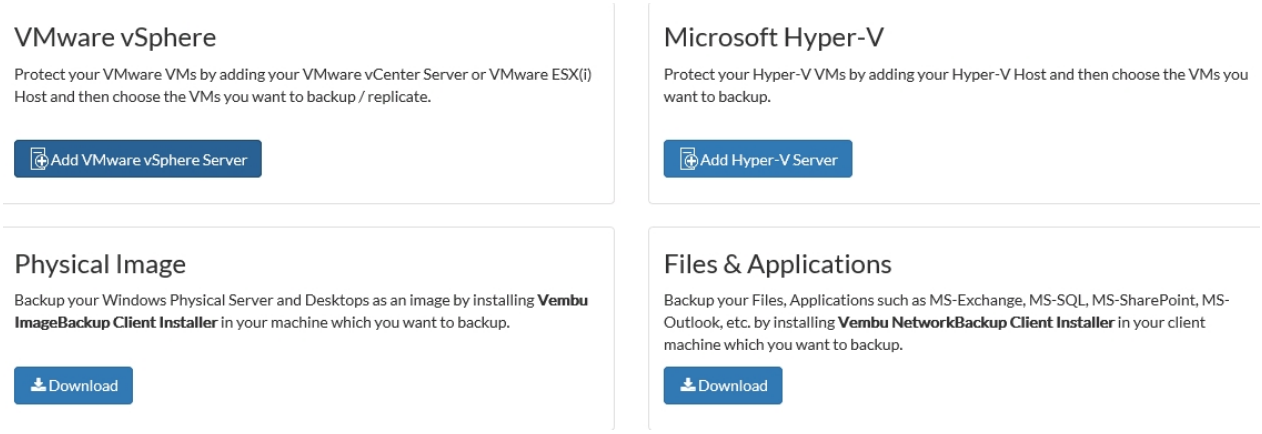


- To configure VMware backup- Follow the instructions given in below link:
  VMware Backup Configuration

Troubleshooting:

- If there seems to be any issue existing in accessing web GUI, check whether VembuBDR service is running in Services.
- Also check whether VembuBDR WebServer service is running.

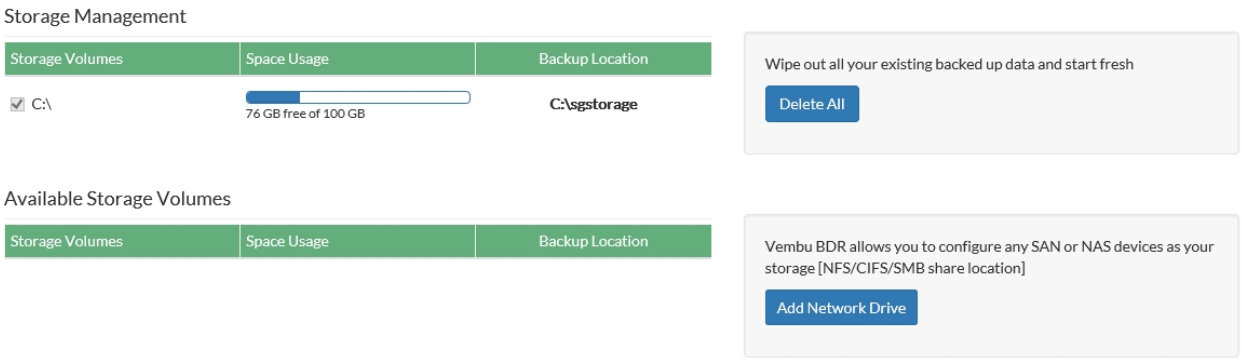
Evaluator's Guide for VMware Backup

Storage Repository Setup

Storage management page lets user manage and configure drives for storing backup data. Vembu BDR have a new file system that halts backup for nothing and once a storage drive gets filled, user can extend storage by edit option where he can add new drives.

Note: Vembu BDR repository management has a hybrid volume manager that supports scalable and extendable backup storage of different storage media such as Local drives, NAS(NFS and CiFS) and SAN(iSCSI and FC).

- Go to 'Management → Storage Management'



- Users can also add network drives using 'Manage network drives' option in settings.

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- Click here to go to Add Network Drives page.

- Click here to Calculate your Storage Space Requirements.
- Click here for steps to Reset Vembu BDR to Fresh Installation state.

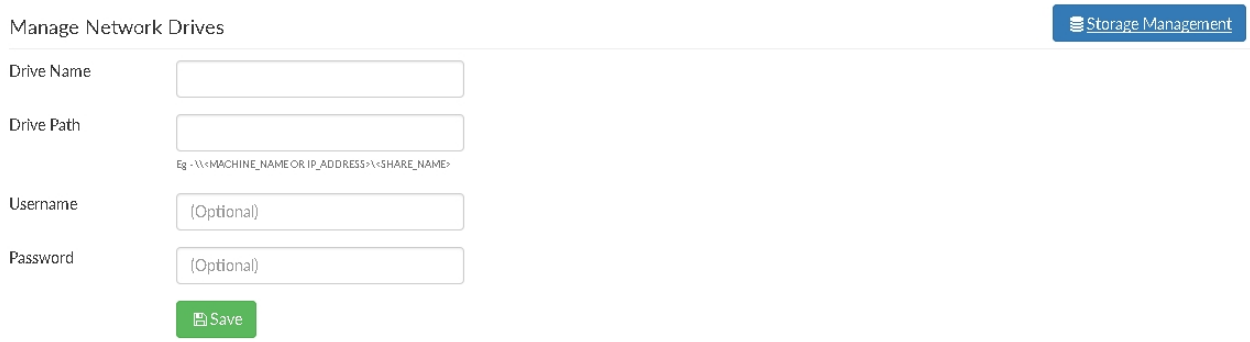
Evaluator's Guide for VMware Backup

Add/Manage Network Drives

This option lets users add, delete network drives which will then be listed in list of storage volumes with a separate drive letter and can be configured for storing backups.
Note: Mapped network drives are not supported when Vembu BDR server runs in local logon account. Change logon user with administrator privileged user in service management console and then proceed configuring Network drive.

To add a network drive, one must provide following attribute details:

- **Drive Name**- Provide a drive letter/name for network drive to be added.
  Note: Drive name must be single alpha character: A-Z or a-z
- **Drive Path**- Network path of drive to be added.
- **Ex:** \\<MACHINE_NAME OR IP_ADDRESS>\<SHARE_NAME>
- **Username & Password**- If network drive requires login authentication provide the username and password to authenticate drive addition.
- A user can add 'n' number of network drives and can manage it via 'Manage network drives' page.
- Once done providing details, click save to add network drive.



- The added drives will be listed as shown in pic above, which can also be deleted using 'delete' option if no longer required.

Evaluator's Guide for VMware Backup

Storage Calculator

Users with large data centers and high data traffic can now calculate their storage space requirements with Vembu Storage calculator. The calculation will be made based on the type of job a user opts for along with recovery points and the average data traffic ratio. We implement a custom compression method that reduces storage space to a vast ratio

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difference compared to source data size.

Click below to calculate your storage space requirements:

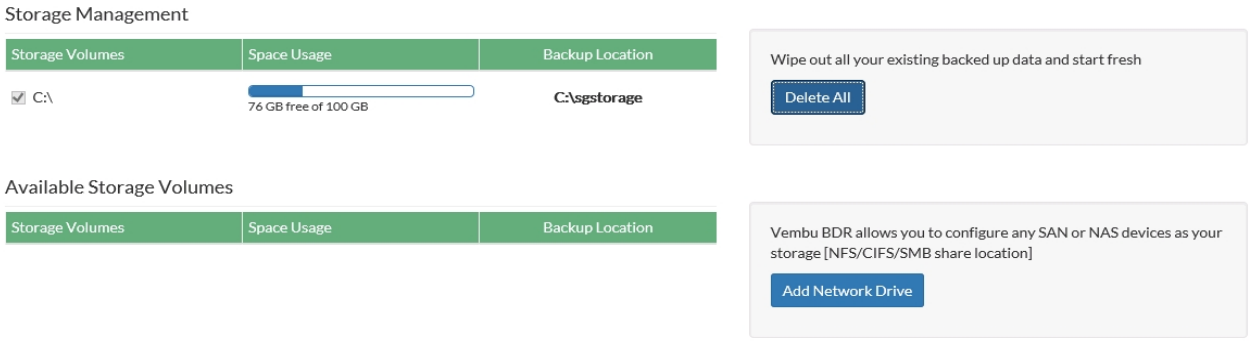
Vembu Storage Calculator

Evaluator's Guide for VMware Backup

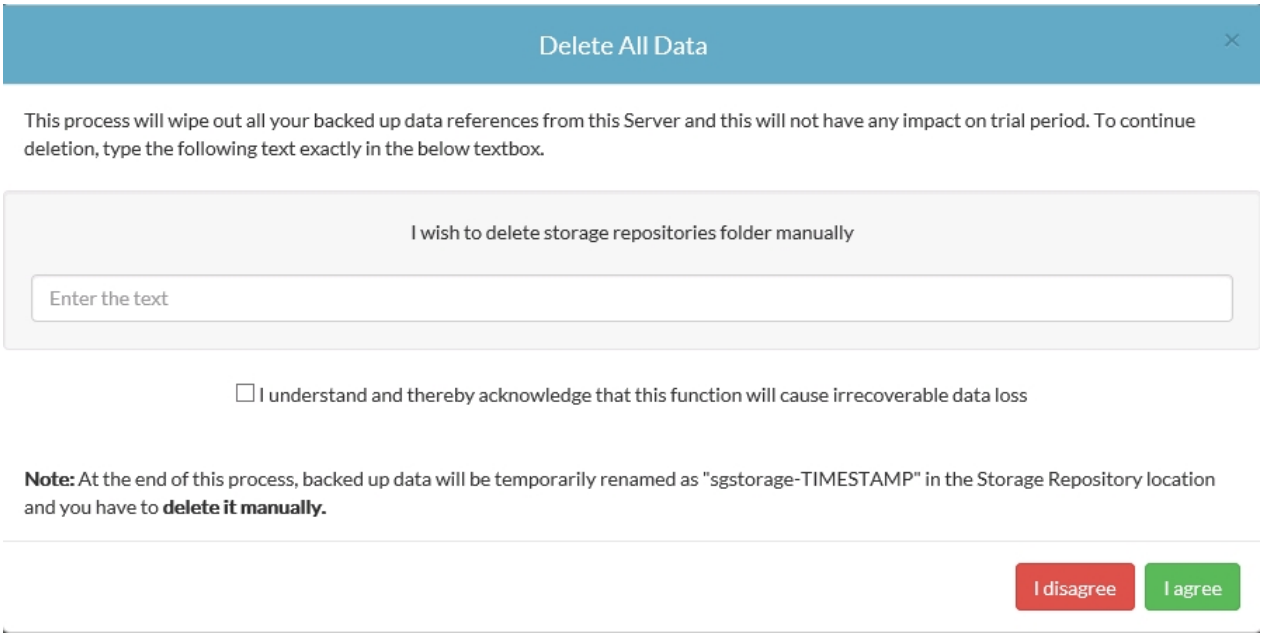
Delete All Data

This option lets user to completely wipeout their server data and reset Vembu BDR to fresh installation state.

- Go to 'Management → Storage Management → Delete All'



- The 'Delete All Data' window will open as shown below.



- In order to proceed with the deletion process the user must type the phrase " I wish to delete storage repositories folder manually" as mentioned in the window. Please note that the command is case-sensitive and the phrase should be typed as given.
- Select the check box to acknowledge the deletion and Click Submit.

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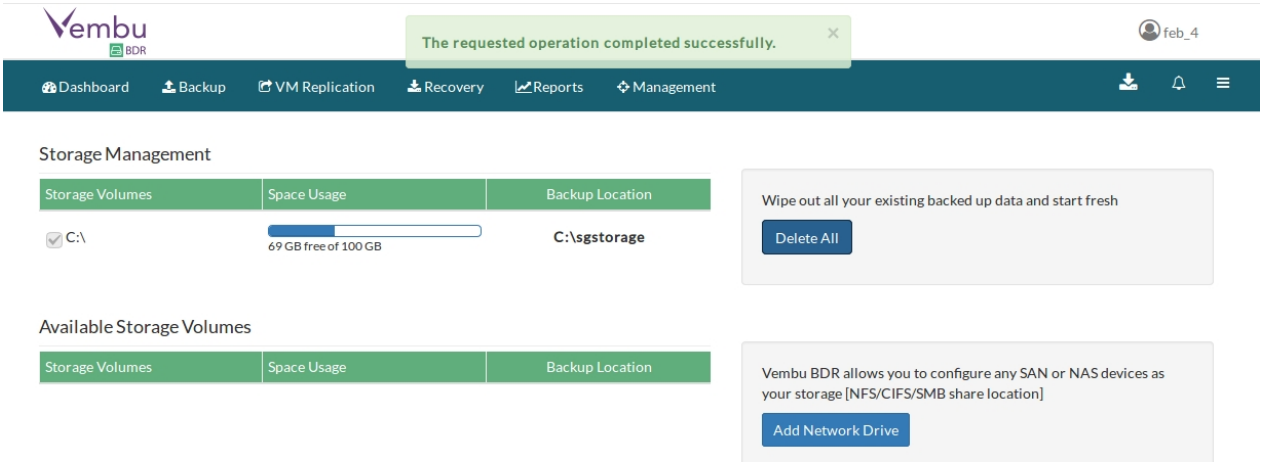


- On proceeding with the Submit will wipe all data and reset Vembu BDR to fresh installation state.

  Note: Proceeding with the delete option will not auto-delete the backed up data, but will rename the sgstorage folder with the timestamp of deletion period in configured storage location. Once the delete process is notified with a success note, you have to manually delete the folder.

Evaluator's Guide for VMware Backup

Getting Started with VMware Backup

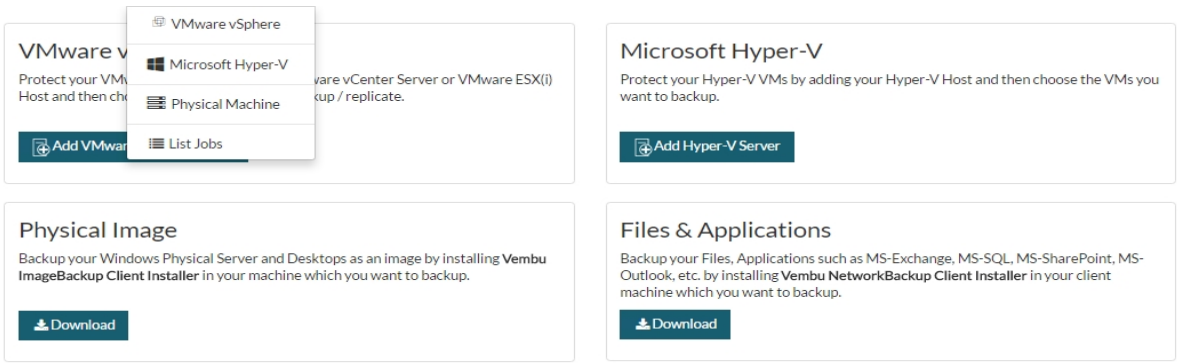
- Setup Backup Job
- Manage Backup Job

Evaluator's Guide for VMware Backup

Setup Backup Job

Adding VMware server:

- Go to Backup → VMware vSphere



- If it's a fresh installation, click on 'Add VMware Server' option.

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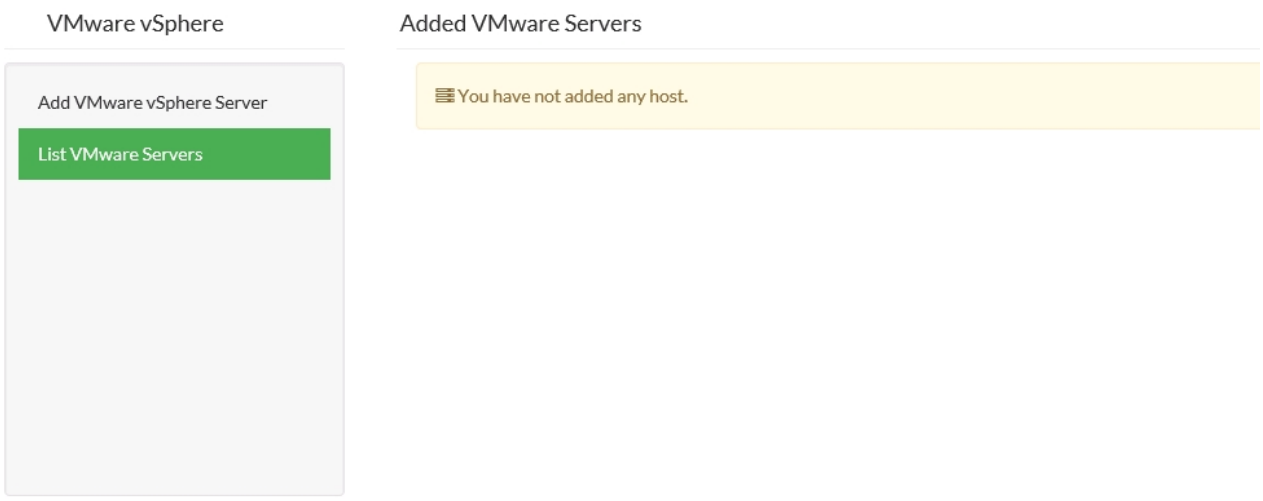
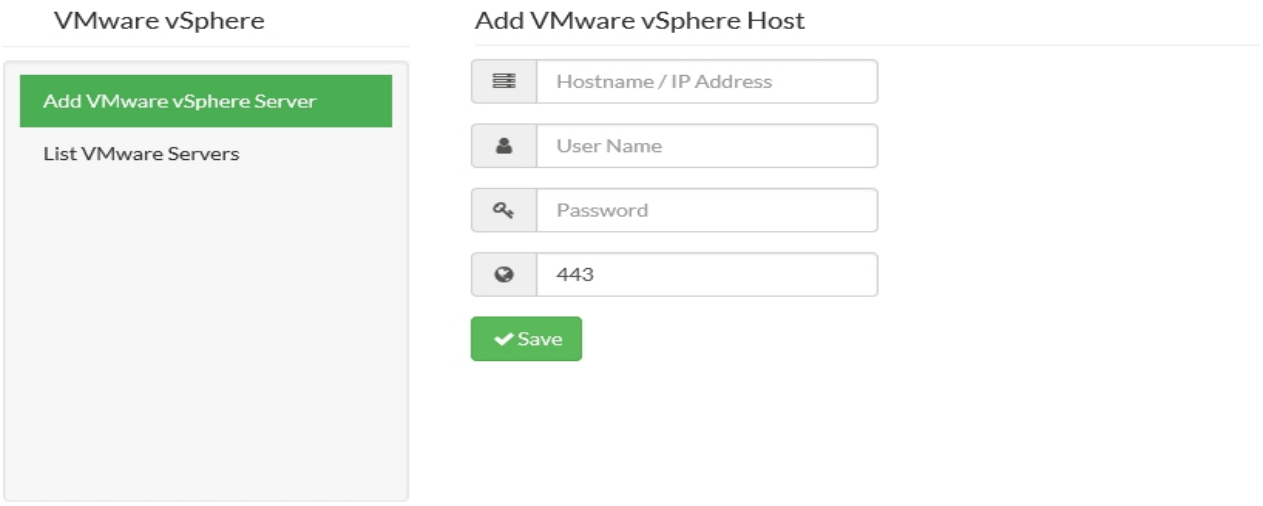
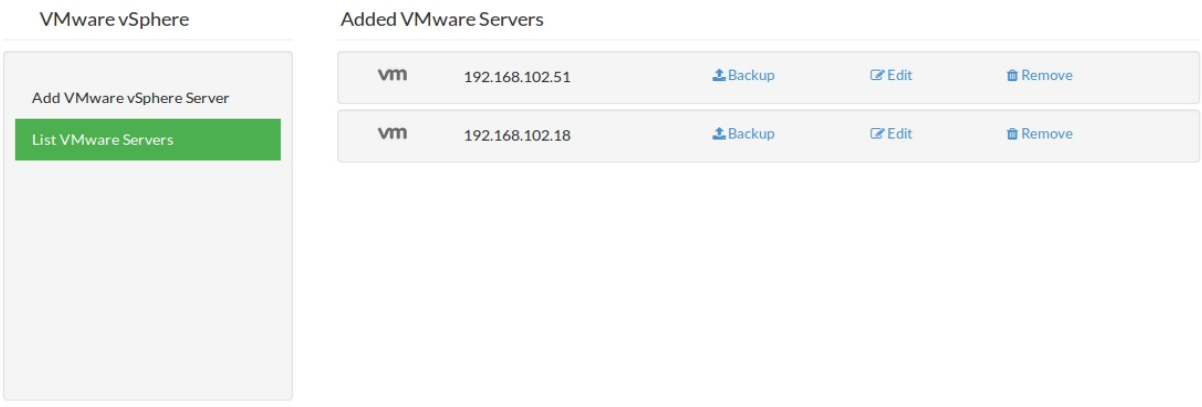


- Add VMware ESXi/vCenter servers by providing host-name and login credentials.
- Click Save.



Create VMware vSphere Backup:

- Once done adding, go to Backup → VMware vSphere. The list of ESXi/vCenter servers added will be shown.



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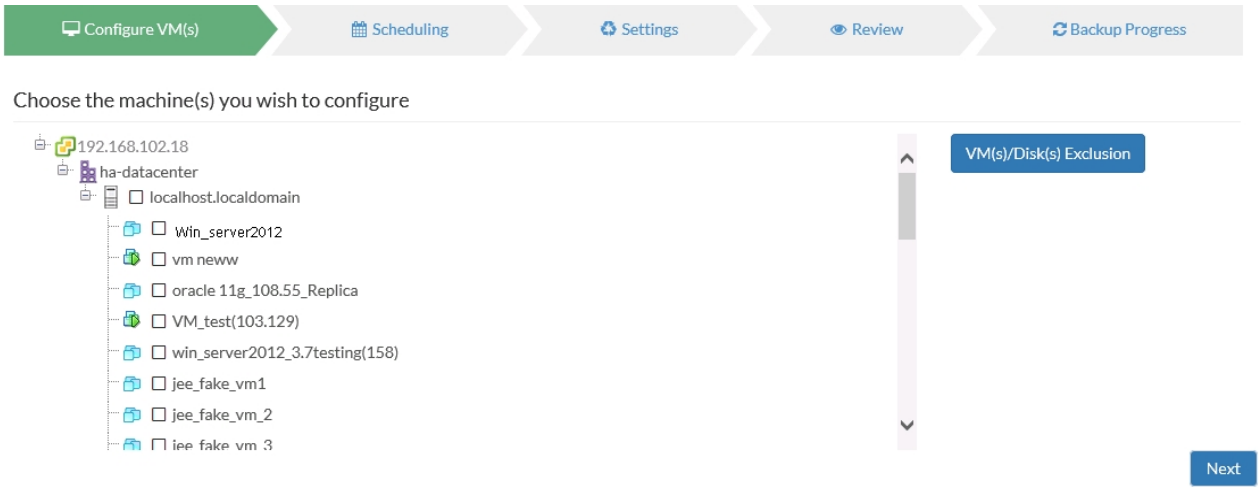
- From the list of VMware servers added, Click Backup Now option in the ESXi/vCenter server to backup VM's from specific servers.

Choose Virtual Machine(s):

- Choose list of VMs you wish to backup and proceed.
- You can configure either host level backup job or can select any specific set of VMs to be backed up.

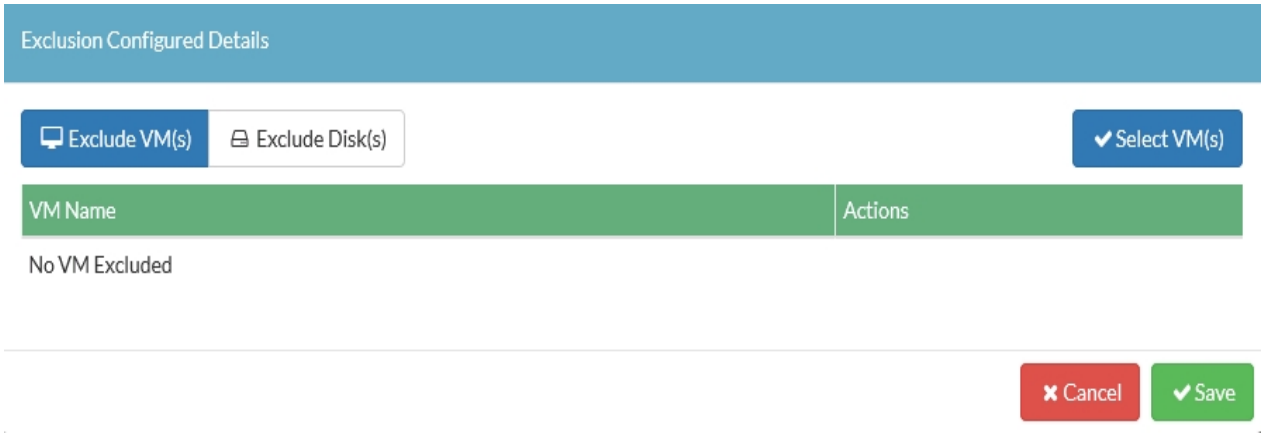


VM(s)/Disk(s) Exclusion

- On selecting Host level backup, you might wish to exclude some specific set of VMs from getting backed up. Such VMs can be excluded using VM(s)/Disk(s) exclusion option.

VM Exclusion

- Click 'VM(s)/Disk(s) Exclusion' option, you will get a popup as shown below.



- Choose 'Exclude VM(s)' tab.
- To exclude a virtual machine from a configured host level backup, click 'select VM' and choose the VMs to be excluded and click 'Exclude'.
- Once added, save the exclusion settings.

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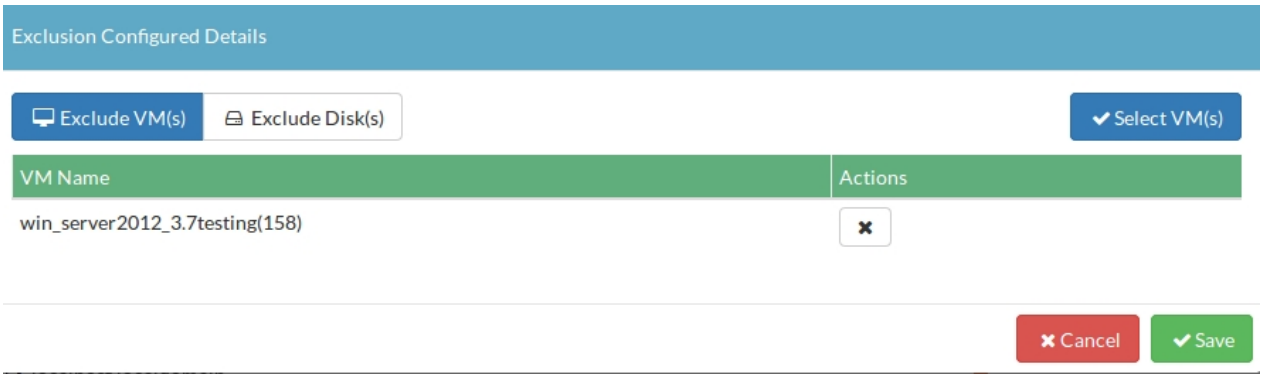
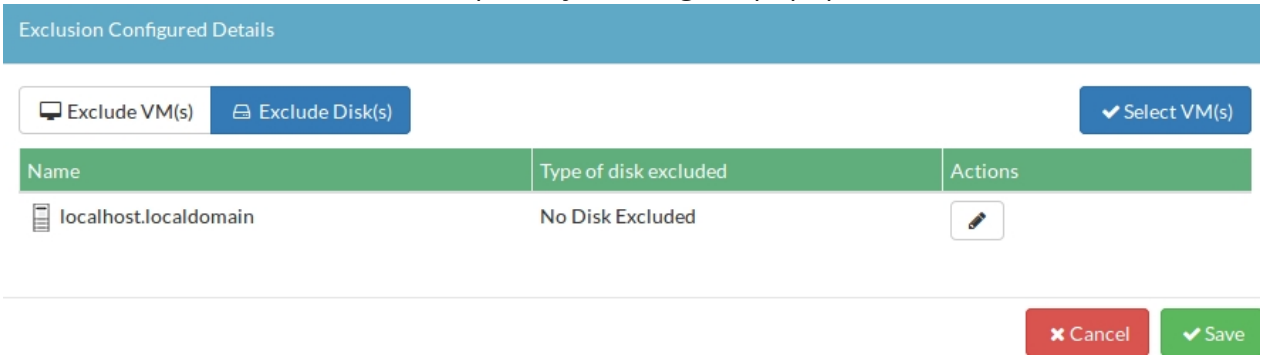


- You can also add/delete a VM to/from exclusion list, whenever required by editing the backup job.
  Note: Changes made in VM exclusion settings will be taken into effect immediately with next incremental schedule.

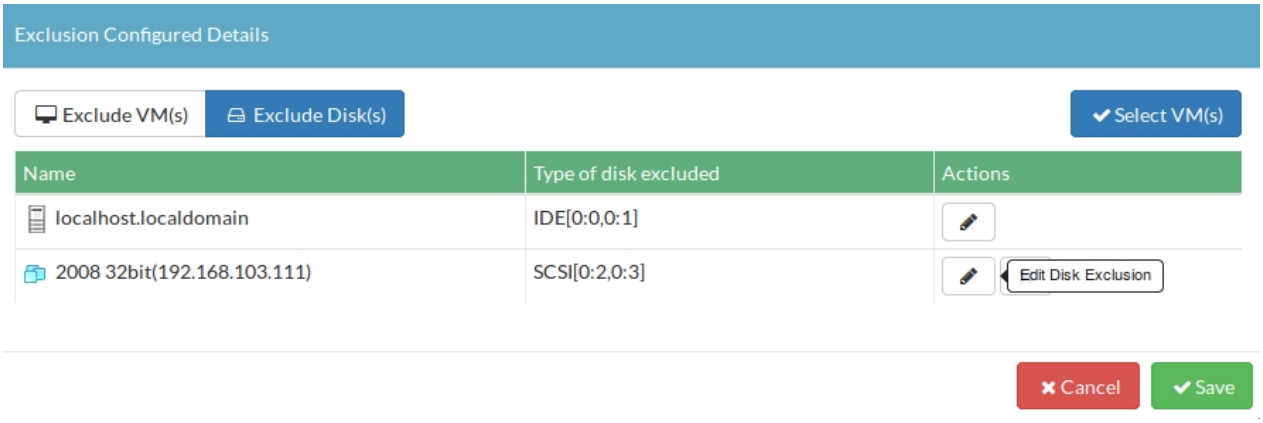
Disk Exclusion

- Click 'VM(s)/Disk(s) Exclusion' option, you will get a popup as shown below.



- Choose 'Exclude Disk(s)' tab.
- Disk exclusion can be either enabled at host level or can be configured at VM level.

  Host level Disk Exclusion- This exclusion type is possible when you opt to configure host level backup job. Under 'Exclude Disk(s)' tab, you will find the configured host(s) listed.



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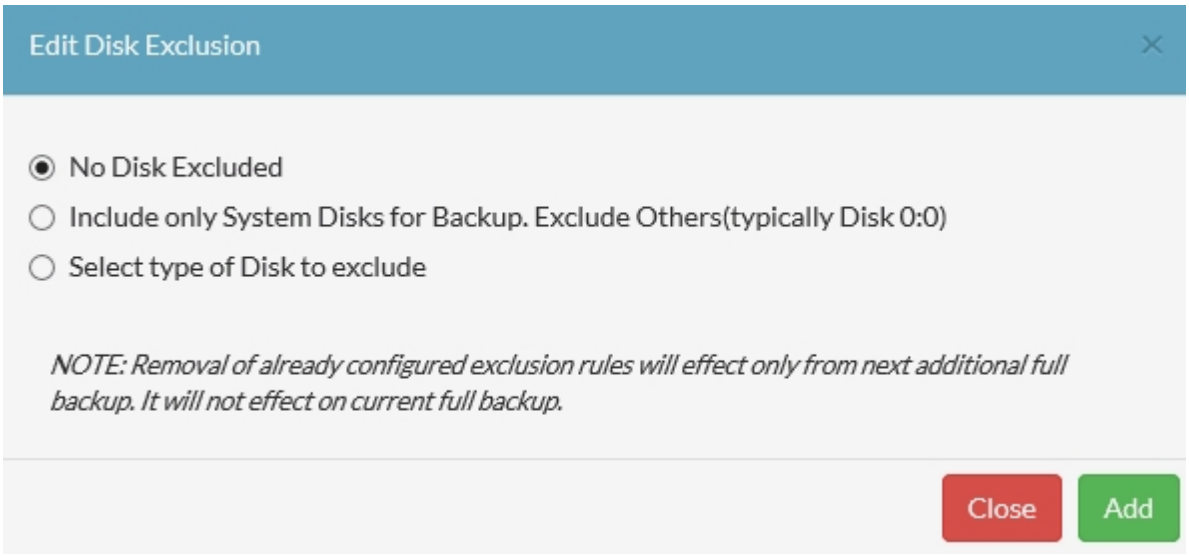
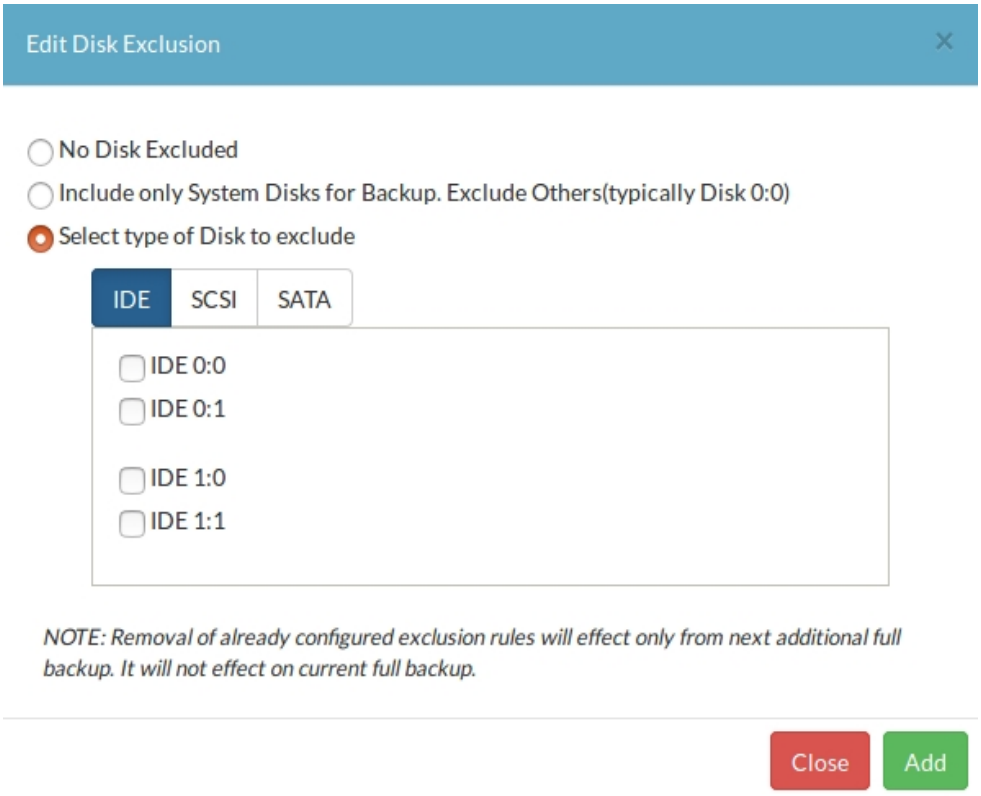
- You can choose 'Edit Disk Exclusion' option, to assign global disk exclusion rule for VMs under a chosen host. Edit Disk exclusion tab will have following exclusion rules:
    - No disks Excluded
    - Include only System Disks for Backup. Exclude Others (typically 0:0)
    - Select type of Disk to exclude

  Note: By default No disks excluded option will be selected.



- Opting for the third option of selecting disk type will list all available disk types for VMs in VMware.
- User can choose the disk(s) to be excluded in each disk type.



- Once done assigning disk exclusion rule, click 'Confirm' and save the exclusion

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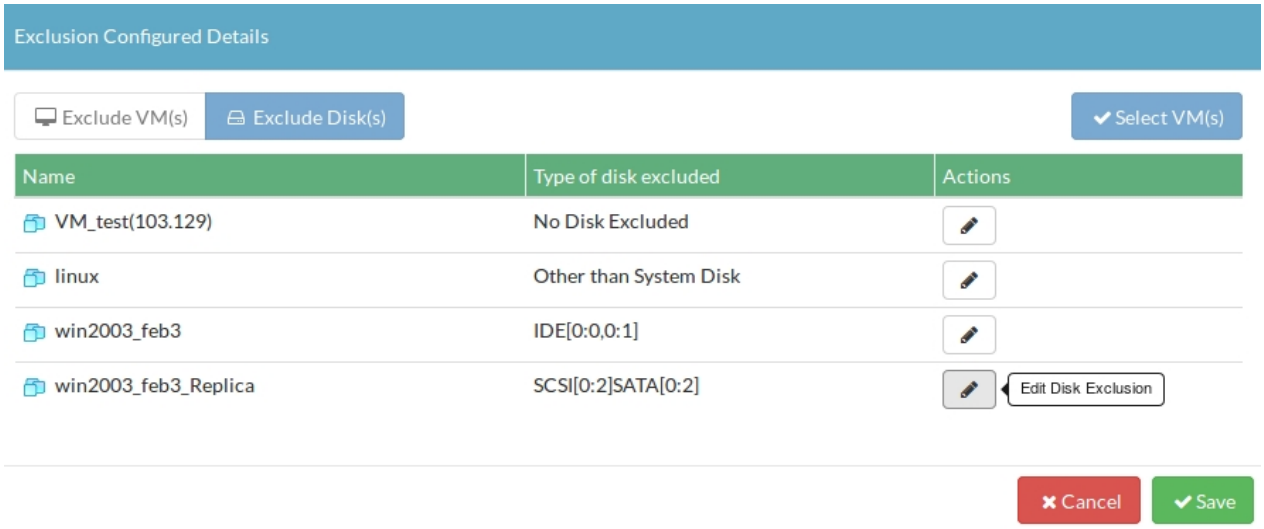
settings.

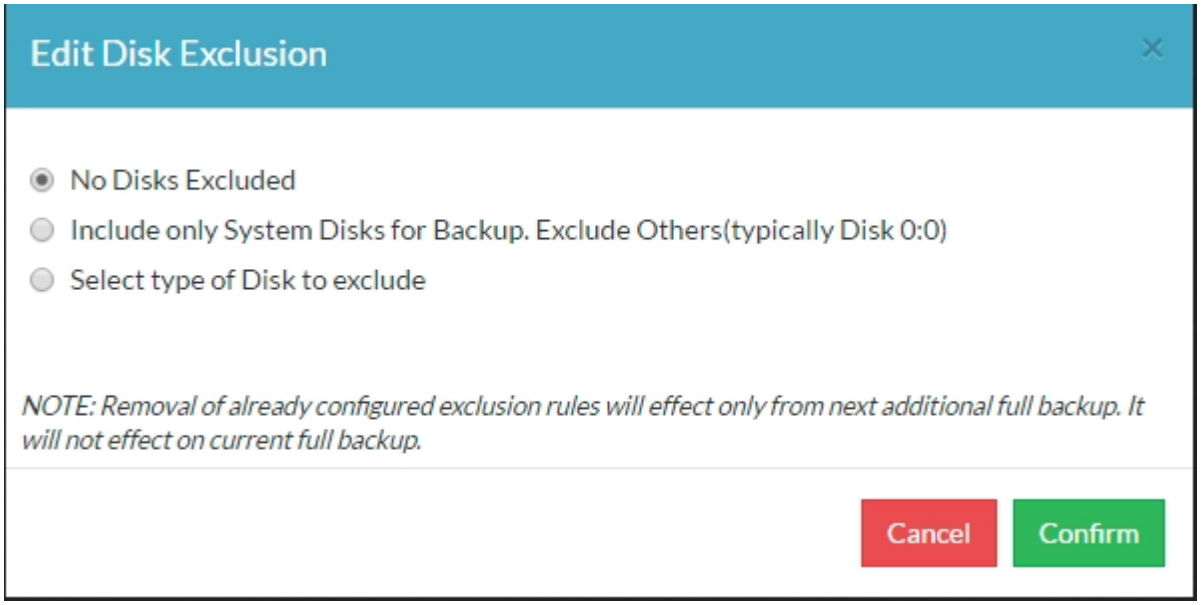
VM level Disk Exclusion- This exclusion type can be configured in both host level and VM level backup job. Under 'Exclude Disk(s)' tab, you will find the list of configured VM(s).

If it's a host level backup job, you can assign both host level exclusion rule as well as assign exclusion rule for individual VMs by adding VMs to be configured using Select VM(s) option.



- Choose 'Edit Disk Exclusion' option alongside a VM to configure disk exclusion rule for the selected VM. Edit Disk exclusion tab will have following exclusion rules:
    - No disks Excluded
    - Include only System Disks for Backup. Exclude Others (typically 0:0)
    - Select type of Disk to exclude

  Note: By default No disks excluded option will be selected.



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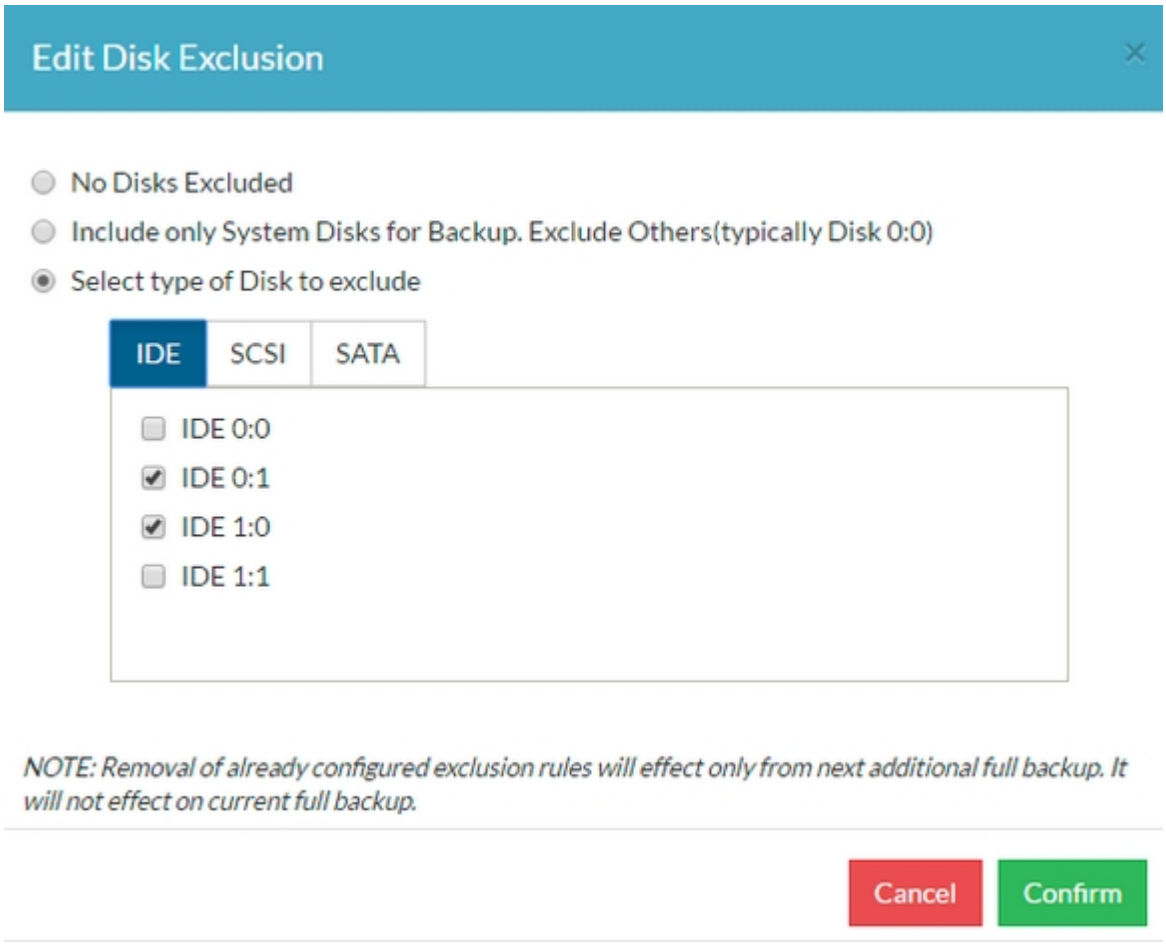
- Opting for the third option of selecting disk type will list all available disk types for VMs in VMware.
- User can choose the disk(s) to be excluded in each disk type.
- Once done assigning disk exclusion rule, click 'Confirm' and save the exclusion settings.



- You can also add/delete a disk to/from exclusion list, whenever required by editing the backup job.
  Note: Changes made in disk exclusion settings will be applied only when a additional full backup is scheduled.

Configure Scheduling:

- Users can configure their backup schedules flexibly based on their requirement. They can choose from Hourly/Daily/Weekly options for backup schedules.

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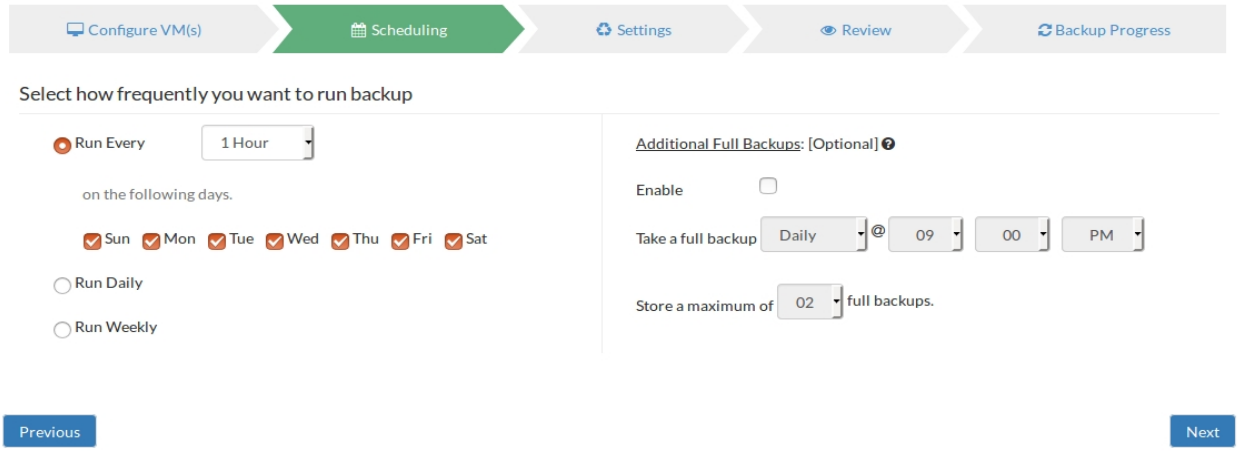

Additional Full Backups:

In an enterprise environment, configuring a backup job with one full backup and forever incremental is not a recommended practice. Users from such environment will tend to configure additional full backups periodically and that can be automated with our additional backup option.

Additional Full Backups can be configured in following order of scheduling:

- For Continuous and Run every few hours schedules- Configuring daily/weekly/monthly additional full backup is possible.
- For Run Daily schedule- Configuring weekly/monthly additional full backup are the possible options.
- For Run Weekly schedule- 'Monthly full backup' is the only possible additional full backup.
- For Run Once schedule- You cannot configure additional full backup.

Note: Users can also limit the number of full backups to be retained with 'Store a maximum of' option. With this option, users can share the unwanted storage data occupied based for a time period. For example, a user needing no more than 6 months of data retainment can configure 6 monthly full backups where the 1st additional full backup will be deleted on the 7th month when a new full backup completes successfully.

Configure Retention Policy:

- Users will be given 2 options for choosing retention policy:
    - Basic retention and
    - Advanced retention (GFS)

Basic:

- Vembu VMBackup provides forever incremental backups, where user can have ‘n' number of incrementals. They also do have options to limit incremental count, which

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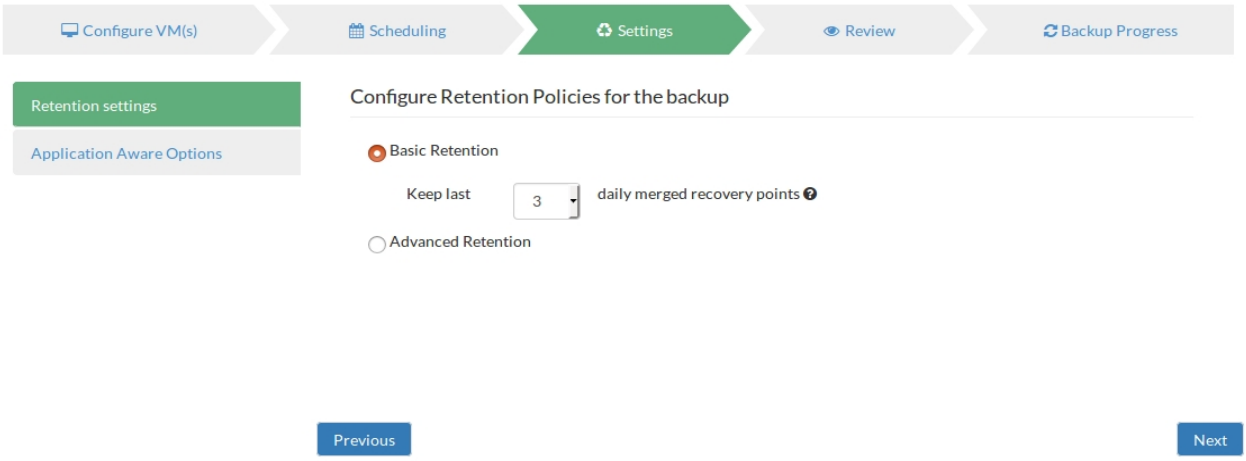
when retention count reaches incremental count, older incrementals will be purged while latest incremental will be retained as per configuration.

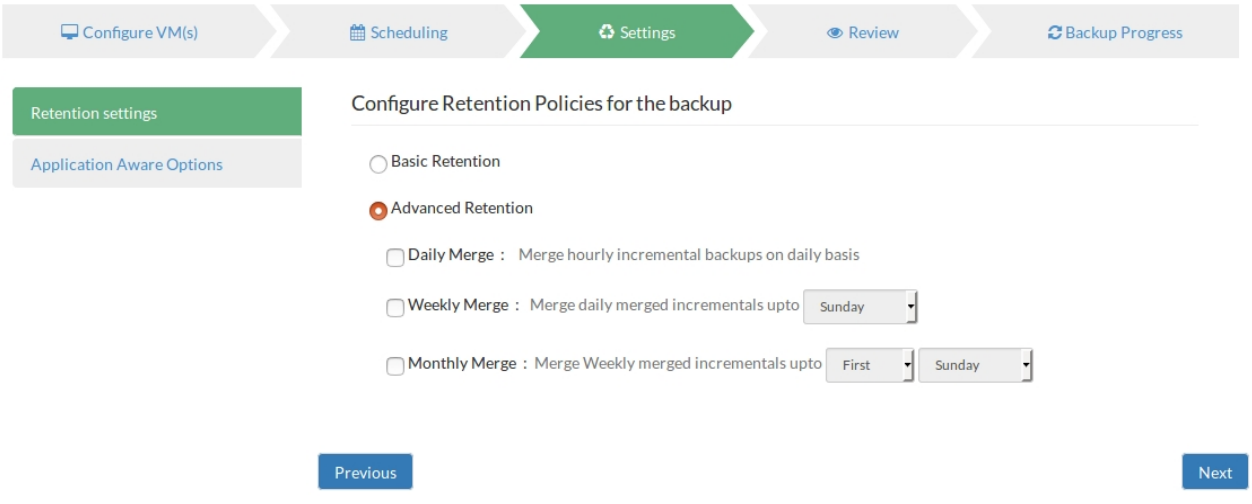


Advanced (GFS Retention):

- The Multilevel GFS retention reduces the time taken to restore backed up machines and most importantly reduce the size of image files in storage location. It also help avoid long chains of incrementals, ensuring safety of backup data and allow you to meet the requirements of your retention policy.

GFS retention merge incrementals on a daily, weekly and monthly basis:

- **Daily** - Daily merge will merge hourly incrementals on the third day's first successful incremental backup.
- **Weekly** - Weekly merge will commence based on user scheduled day's first successful incremental backup. It will merge all daily merged incrementals into a single weekly merged file.
- **Monthly** - Monthly merge is much similar as weekly merge where user need to schedule particular day in a month(For example: Third Wednesday) and the merge will get initiated at first successful incremental of the day. It merges all weekly merged files as a single monthly file.



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Application-Aware VMware Backups:

VMware backups using VMware APIs, utilize application-specific VSS writers (SQL Server, Exchange) to take application-consistent backups and truncate exchange log files to free up the space.

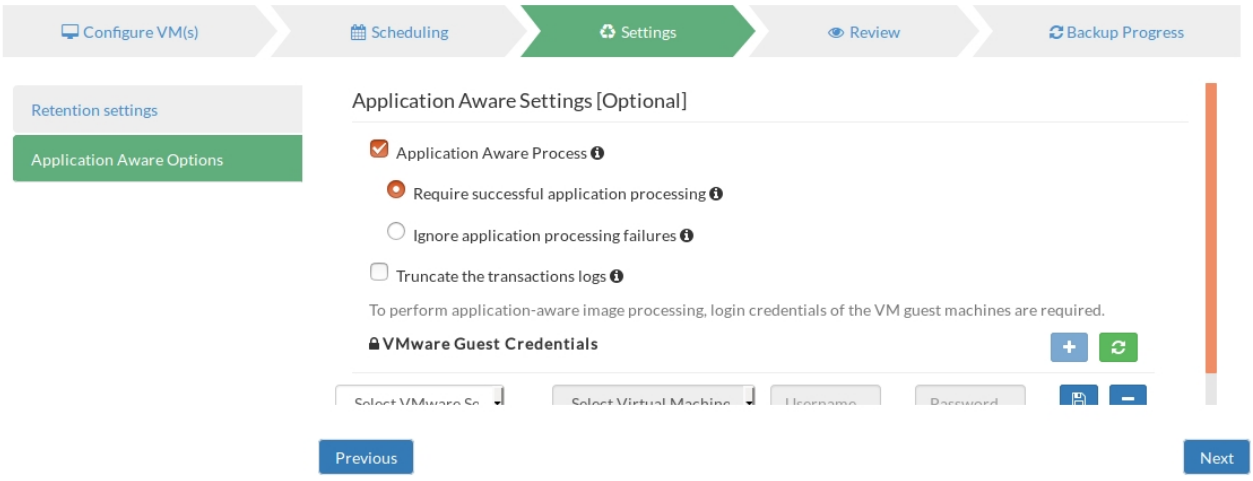
- **Enabling application aware process, gives users two choices to choose:**
    - **Require successful application processing:** Choosing this option lets Vembu BDR track application consistency and triggers backup process, only when all the VSS writers in the VM are in stable state.
    - **Ignore application processing failures:** This option, lets Vembu BDR trigger backup jobs whenever the job is scheduled, despite the success/failure of application processed.

Truncate the transaction logs:

- Enabling this option lets Vembu BDR truncate the exchange server logs before initiating backup process. It purges and commits log files along with the .edb files and reduce storage space consumed.

Application Aware Image Process Prerequisites:

- Backup jobs enabled with application-aware image process option requires that your guest OS has latest VMware Tools, all the latest packages and patches installed.
- To perform application-aware image processing, you must provide guest OS login credentials for the selected VM(s) running MS Exchange server, MS SQL Server, MS SharePoint Server, MS Active Directory.



VMware Guest Credentials:

- To perform application-aware image processing, login credentials of VM guest machines are required. Such Guest OS login details can be provided using this option.

    - Select the desired VMware server and select the virtual machine to which you wish to enable application aware backups.
    - Provide the login credentials of the Virtual machine and save it.

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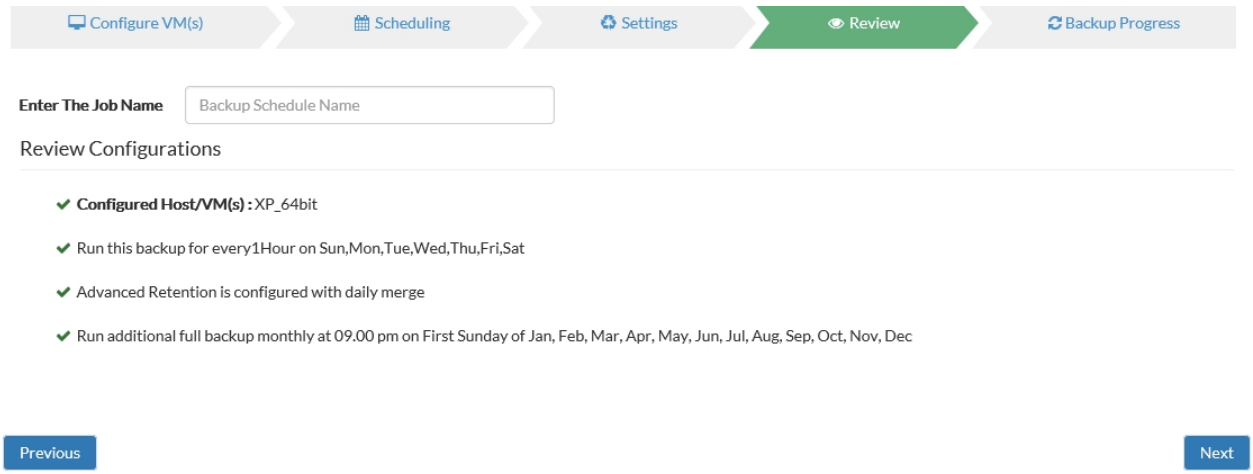
- Now scheduling VMware backup for particular VM will have application-aware options enabled.

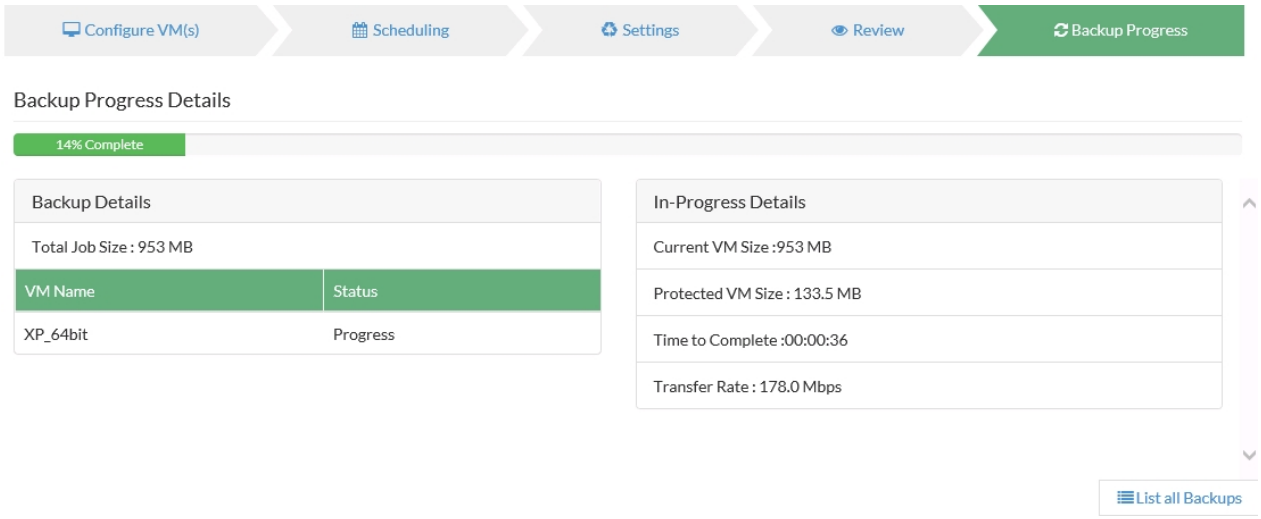
Review Configurations:

- User will be required to provide a name for backup scheduled.
- And can verify the configurations one final time, before hitting 'run the backup'.



Progress Details:

- Thus, backup progress is witnessed and can be verified once it completes successfully.



Evaluator's Guide for VMware Backup

Manage Backup Job

- Go to ' Backup → List Jobs'.
- The list of backup jobs configured from that particular client machine will be listed along with options to edit, suspend/resume, run/abort, delete the backup job.
- Users can also view the plugin type and historical report of a particular backup job.

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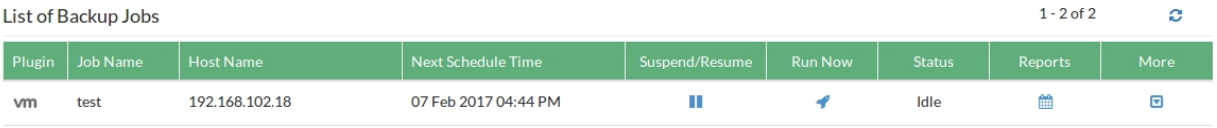
List of Backup Jobs 1 - 2 of 2

Plugin	Job Name	Host Name	Next Schedule Time	Suspend/Resume	Run Now	Status	Reports	More
vm	test	192.168.102.18	07 Feb 2017 04:44 PM			Idle		

Suspend/Resume:

- This option lets a user to suspend and resume a configured backup job, if required.
- A suspended backup job will not run schedules as per its configuration, until/unless it is resumed.

Run Now:

- This option is used to immediate schedule a backup job, once clicked.
- If run now is triggered in midst of scheduled interval, then the next schedule interval will be calculated from the time of recent backup job.
  Note: If a backup job is triggered in midst of scheduled interval with run now, then the next backup schedule will be triggered

Abort:

- This option is used to abort a backup job that is currently in progress, if required.

View:

- This option allow user to view the saved configuration of any specific backup job.

Edit:

- This option allow user to edit the configuration of an already scheduled backup job.
- Edit option allow user to completely reconfigure the backup job being edited. (i.e) User can:
  - Add/remove VMs.
  - Reconfigure the schedule frequency, retention policies, additional backups and application aware options of backup job.
- Once done, review the edited configuration and save it.

Delete:

- This option is used to delete the backup job, if no longer required.
- Proceeding with this option, will ask for deletion confirmation and once confirmed the backup job will be deleted.

Evaluator's Guide for VMware Backup

VM Replication

VM replication page allow users to replicate VMs from a source ESXi/vCenter server to a target ESXi/vCenter server in DR location without disrupting routine tasks of the primary ESXi/vCenter server(Source). Please note that, virtual machines that are active/running can also be replicated without any disruption in their performance.

- VM replication is recommended for business critical processes, where business critical

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VMs can be replicated in regular periodic interval so that disasters are less harmful.

- Vembu powered VM replication clubbed with features such as: Failover, Failback and Network & IP remapping, simplifies disaster recovery ensuring an effective replication process.

Setup Replication Job

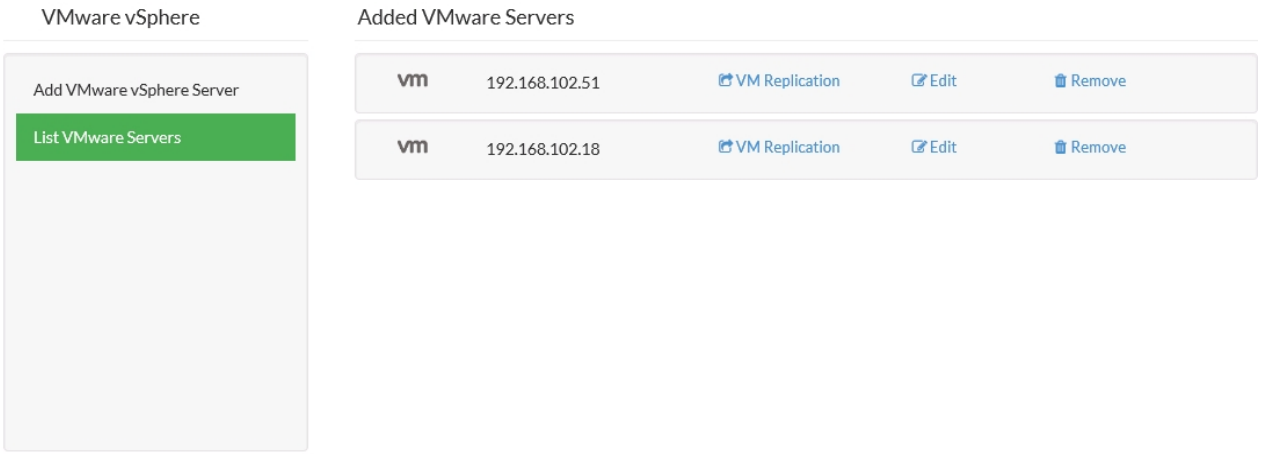
Manage Replication Job

Evaluator's Guide for VMware Backup

Setup Replication Job

Configuring VMware vSphere Replication:

- Go to VM Replication → VMware vSphere.
- You will have list of ESXi/vCenter servers added. Click on Replicate Now to begin configuring replication.



Choose Virtual Machine(s):

- Choose list of VMs you wish to replicate and proceed.
- You can configure either host level replication job or can select any specific set of VMs to be replicated.

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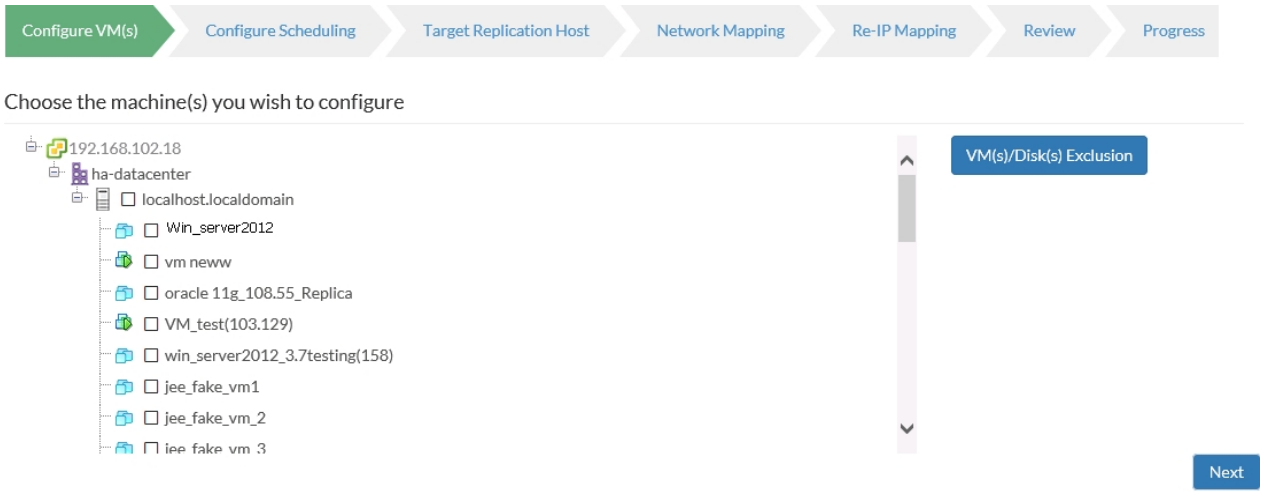
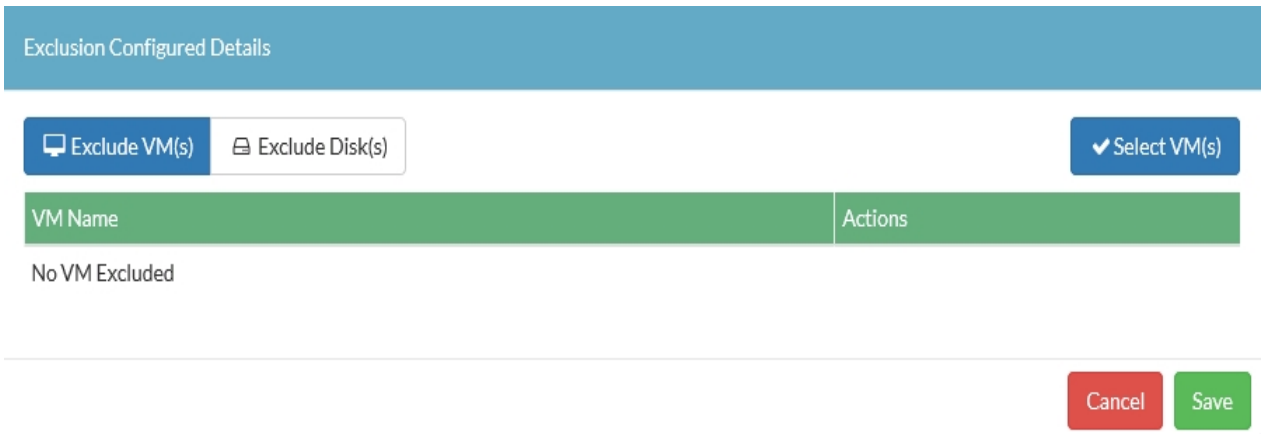


VM(s)/Disk(s) Exclusion

- On selecting Host level replication, you might wish to exclude some specific set of VMs from getting replicated. Such VMs can be excluded using VM(s)/Disk(s) exclusion option.

VM Exclusion

- Click 'VM(s)/Disk(s) Exclusion' option, you will get a popup as shown below.



- Choose 'Exclude Disk(s)' tab.
- To exclude a virtual machine from a configured host level replication, click 'select VM' and choose the VMs to be excluded and click 'Exclude'.
- Once added, save the exclusion settings.

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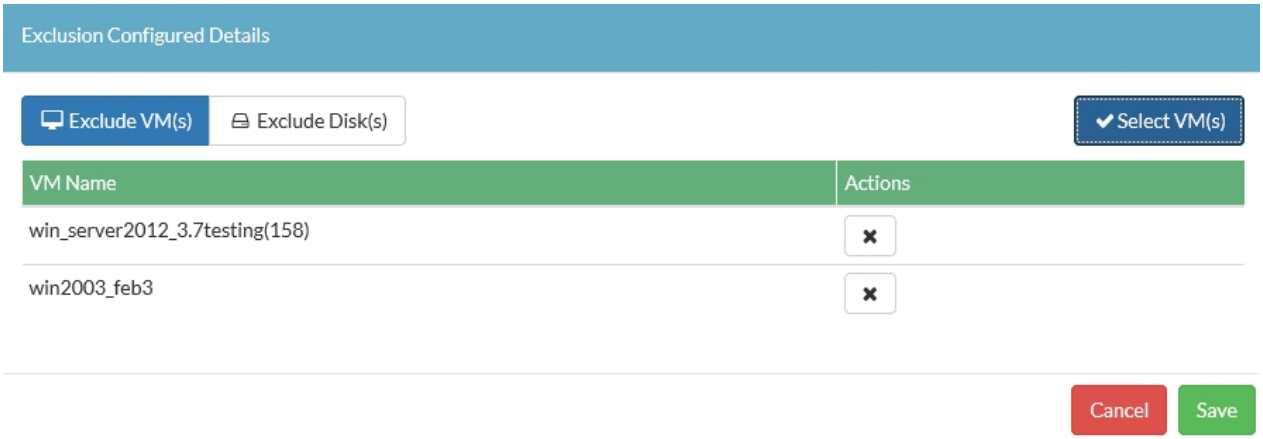
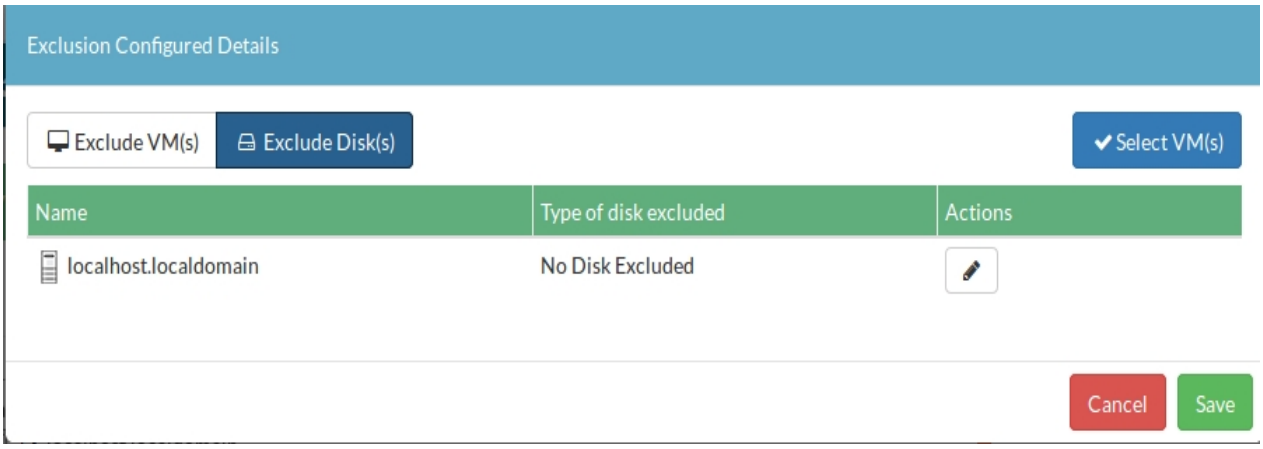


- You can also add/delete a VM to/from exclusion list, whenever required by editing the replication job.
  Note: Changes made in VM exclusion settings will be taken into effect immediately with next replication schedule.

Disk Exclusion

- Click 'VM(s)/Disk(s) Exclusion' option, you will get a popup as shown below.



- Choose 'Exclude Disk(s)' tab.
- Disk exclusion can be either enabled at host level or can be configured at VM level.

  Host level Disk Exclusion- This exclusion type is possible when you opt to configure host level replication job. Under 'Exclude Disk(s)' tab, you will find the configured host(s) listed.

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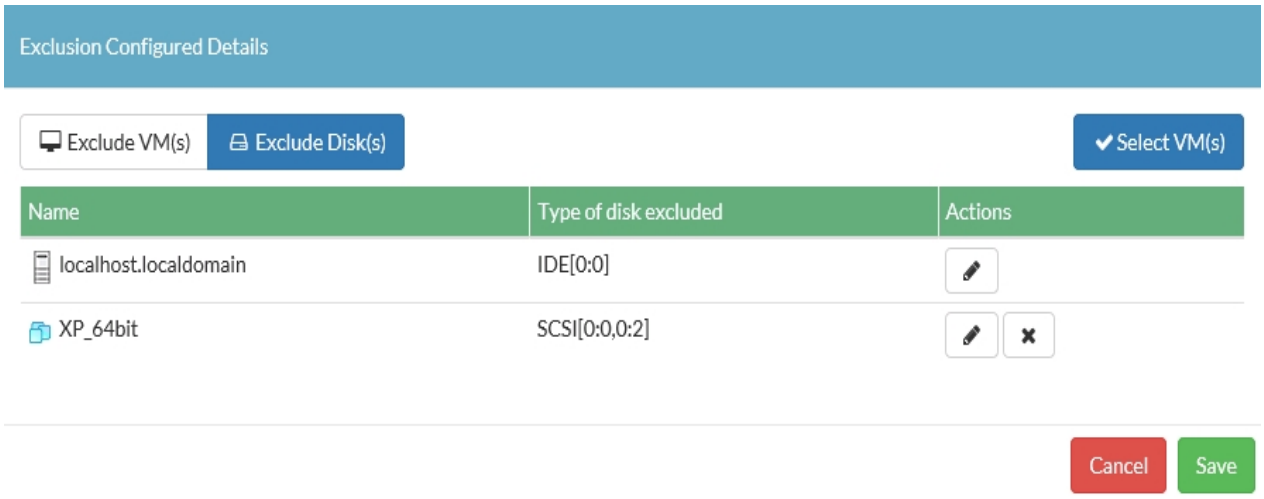
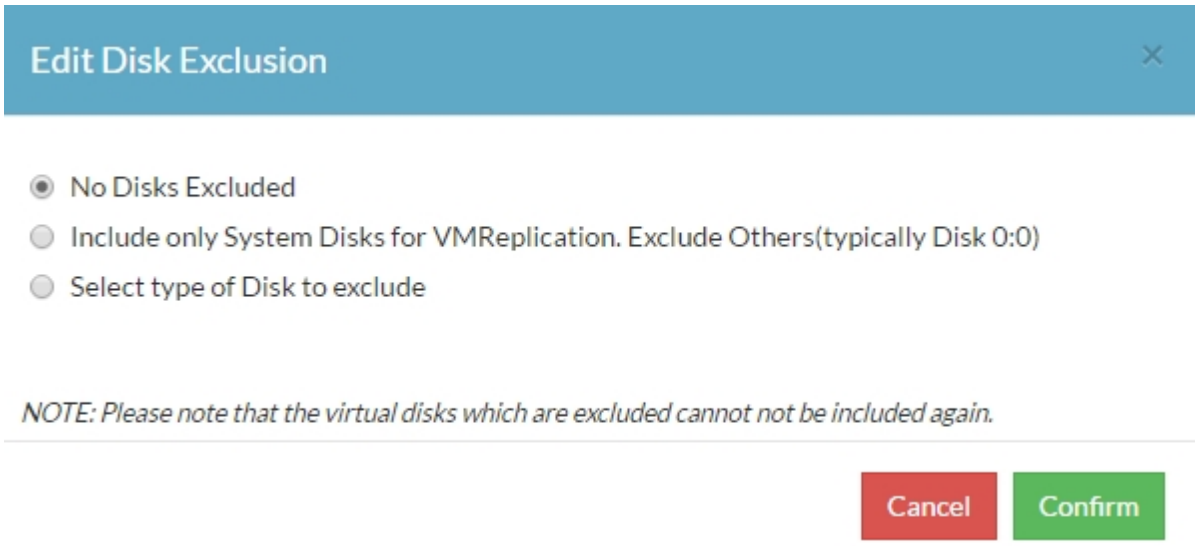


- You can choose 'Edit Disk Exclusion' option, to assign global disk exclusion rule for VMs under a chosen host. Edit Disk exclusion tab will have following exclusion rules:
    - No disks Excluded
    - Include only System Disks for VM replication. Exclude Others (typically 0:0)
    - Select type of Disk to exclude

  Note: By default No disks excluded option will be selected.



- Opting for the third option of selecting disk type will list all available disk types for VMs in VMware along with possible disk lists.
- User can choose the disk(s) to be excluded in each disk type.

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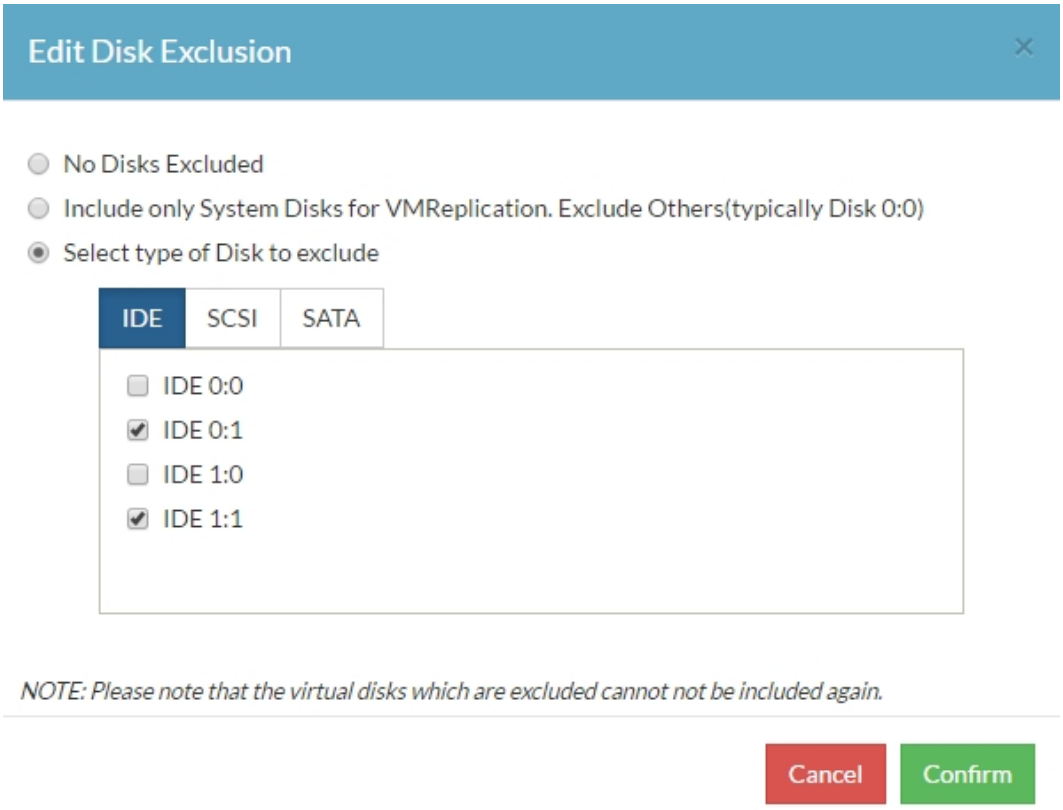
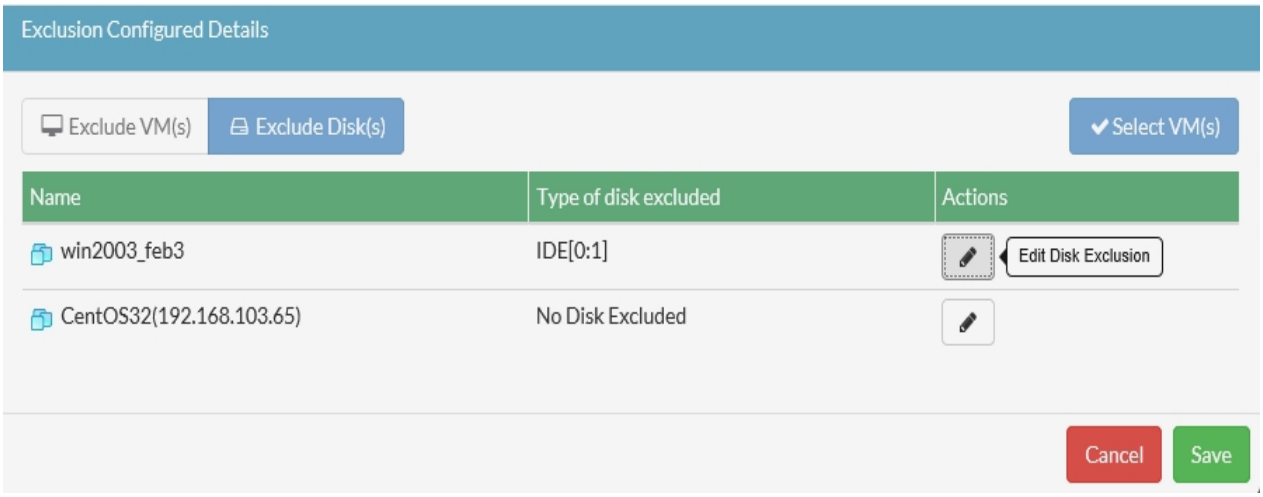


- Once done assigning disk exclusion rule, click 'Confirm' and save the exclusion settings.

  VM level Disk Exclusion- This exclusion type can be configured in both host level and VM level replication job. Under 'Exclude Disk(s)' tab, you will find the list of configured VM(s).

  If it's a host level replication job, you can assign both host level exclusion rule as well as assign exclusion rule for individual VMs by adding VMs to be configured using Select VM(s) option.



- Choose 'Edit Disk Exclusion' option alongside a VM to configure disk exclusion rule for the selected VM. Edit Disk exclusion tab will have following exclusion rules:

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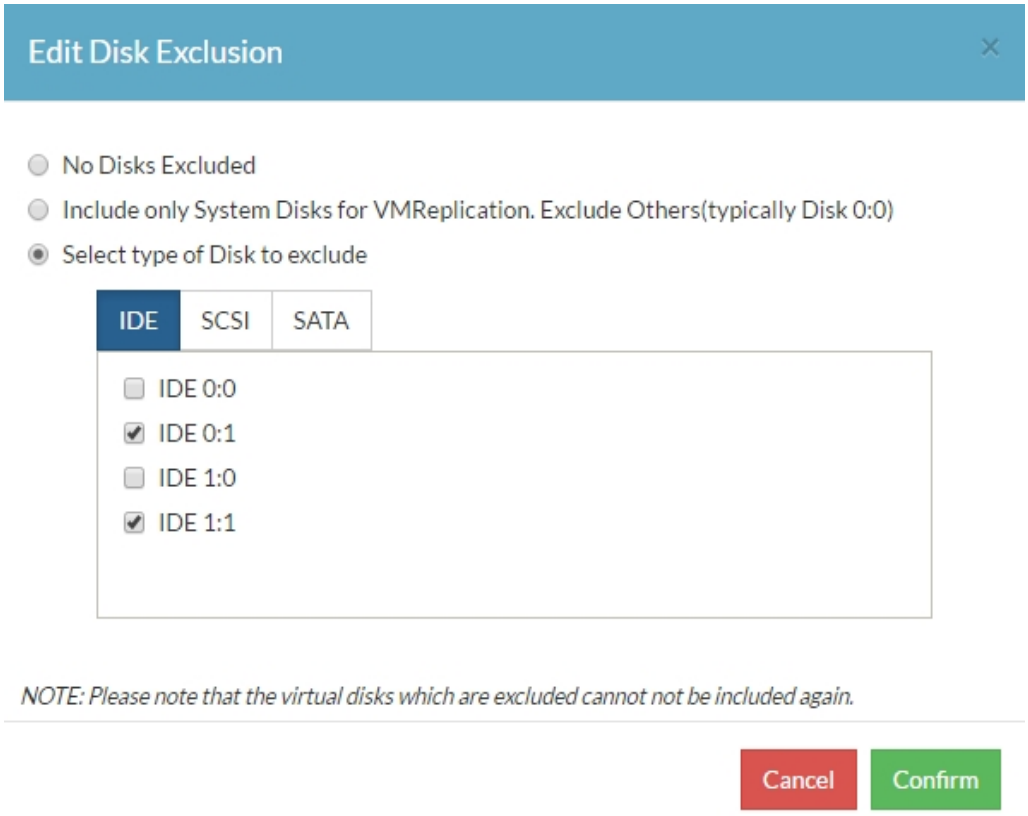
- No disks Excluded
- Include only System Disks for VM replication. Exclude Others (typically 0:0)
- Select type of Disk to exclude

Note: By default No disks excluded option will be selected.

- Opting for the third option of selecting disk type will list all available disk types for VMs in VMware along with possible disk lists.
- User can choose the disk(s) to be excluded in each disk type.
- Once done assigning disk exclusion rule, click 'Confirm' and save the exclusion settings.



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- Disks once excluded cannot be included back in already configured replication job.

Configure Scheduling:

- Now users can configure replication schedules flexibly based on requirement. They can choose between Hourly/Daily/Weekly options for replication schedules.

Application-Aware Options for VMware Replication:

VMware replication using VMware APIs, utilize application-specific VSS writers (SQL Server, Exchange) to make application-consistent replication and truncate exchange log files to free up the space.

Enabling application aware process, gives users two choices to choose:

- **Require successful application processing:** Choosing this option lets Vembu BDR track application consistency and triggers replication process, only when all the VSS writers in the VM are in stable state.
- **Ignore application processing failures:** This option, lets Vembu BDR trigger replication jobs whenever the job is scheduled, despite the success/failure of application processed.

Truncate the transaction logs:

- Enabling this option lets Vembu BDR truncate the exchange server logs before initiating replication process. It purges and commits log files along with the .edb files and reduce storage space consumed.

Application Aware Image Process Prerequisites:

- Replication jobs enabled with application-aware image process option requires that your guest OS has latest VMware Tools, all the latest packages and patches installed.
- To perform application-aware image processing, you must provide guest OS login credentials for the selected VM(s) running MS Exchange server, MS SQL Server, MS SharePoint Server, MS Active Directory.

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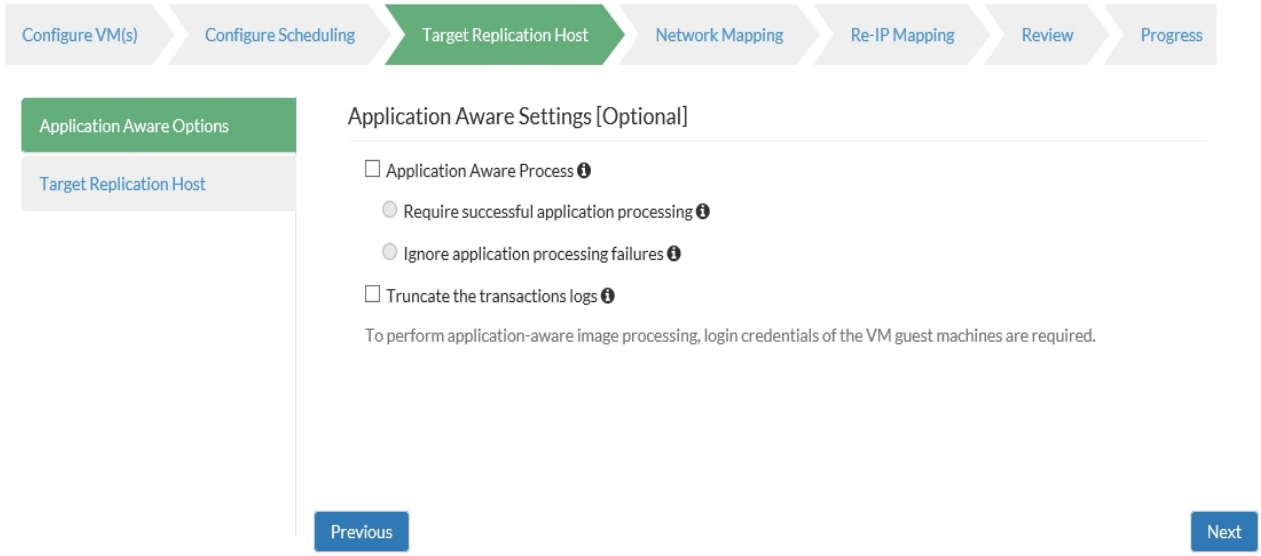


VMware Guest Credentials:

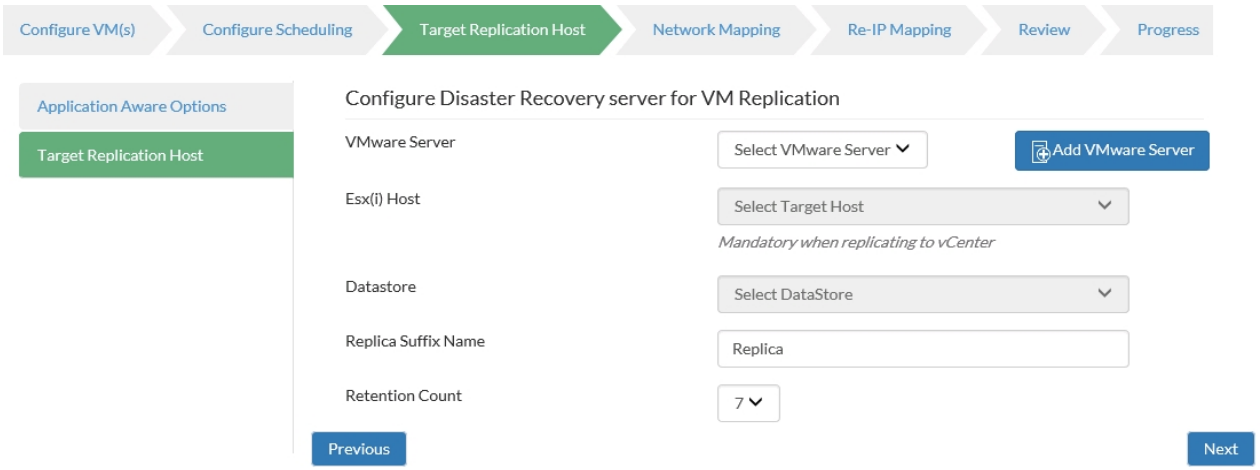
To perform application-aware image processing, login credentials of VM guest machines are required. Such Guest OS login details can be provided using this option.

- Select the desired VMware server and select the virtual machine to which you wish to enable application aware replication.
- Provide the login credentials of the Virtual machine and save it.
- Now scheduling VMware replication for particular VM will have application-aware options enabled.

Configuring Disaster Recovery Server for Power Replication™:

- Choose a Target VMware server/vCenter → Select a target host from the available list(Mandatory for vCenter replication) → Select a Datastore from the available list.
- By default, target VM replica will be given a suffix name as 'Replica', which can also be edited.
- Select retention count for replicated data, which is by default set at maximum count.

- Once done with all the above options, proceed with Next.



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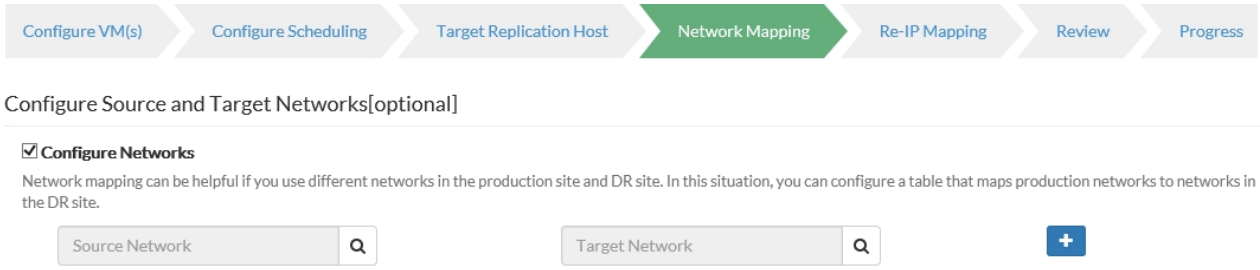
Network Mapping:

Network mapping can be helpful if you use different networks in the production site and DR site. In this situation, you can configure a table that maps production networks to networks in the DR site.

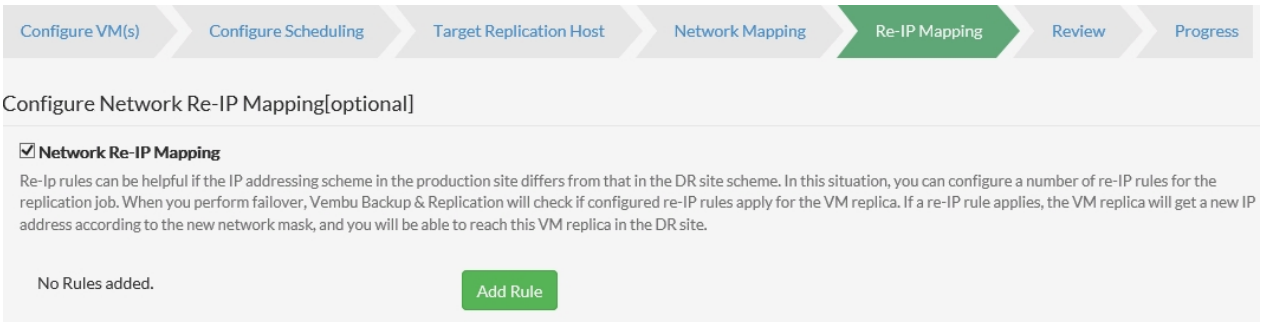
- If you wish to configure Network Mapping, do enable the 'Configure Networks' checkbox.
- Click on 'Add Network Mapping' to add and map more networks.
- Once done mapping networks, proceed with Next.



Configure Re-IP Mapping:

Re-Ip rules can be helpful if the IP addressing scheme in the production site differs from that in the DR site scheme. In this situation, you can configure 'n' number of re-IP rules for the replication job.

- Re-IP Mapping rule will be applied during FailOver. When FailOver, the replica will be power on with the configured Re-IP Mapping rules.
- If you wish to configure Network Re-IP Mapping, do enable the Network Re-IP Mapping checkbox.



- A dialog box, to add Re-IP rule will popup. Do fill all required details and save the rule.
- You can also add more rules, with Add Rule option.

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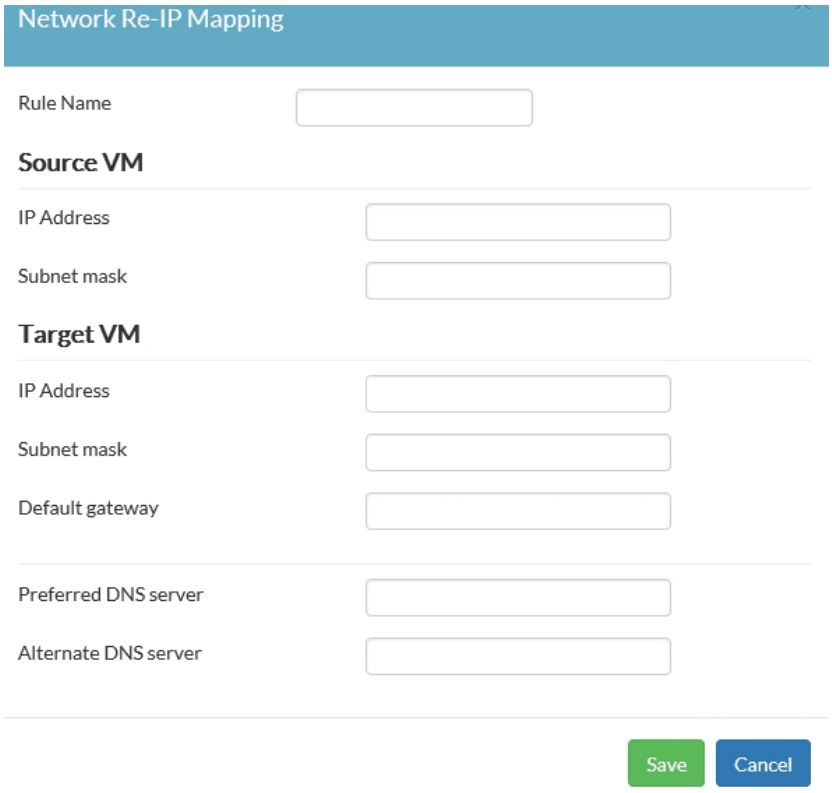
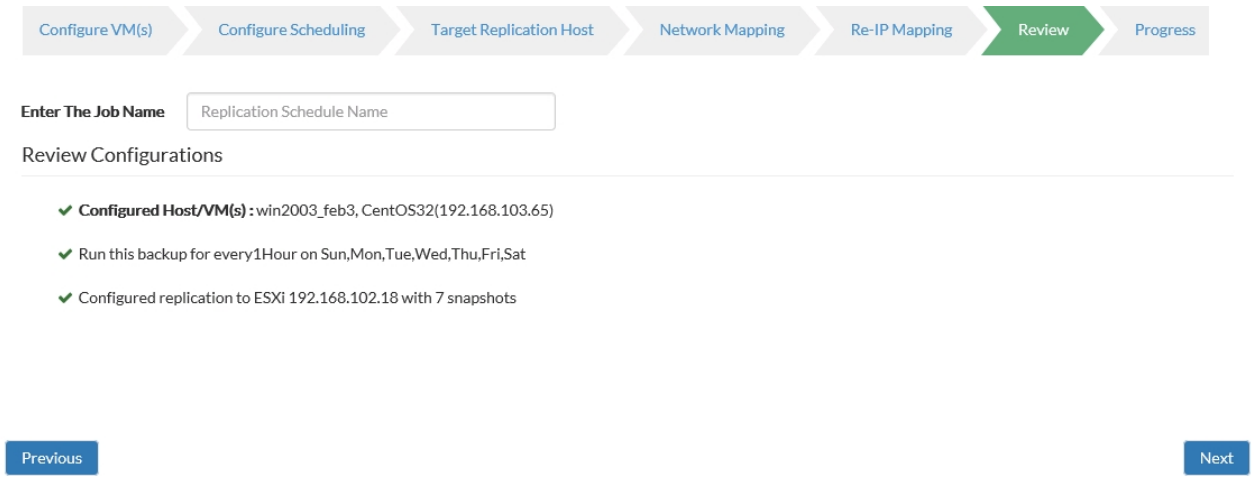


- Now proceed to Review the configurations entered and once done reviewing, provide a name for replication job and trigger start the replication.



- Monitor the replication progress and ensure it completes successfully.

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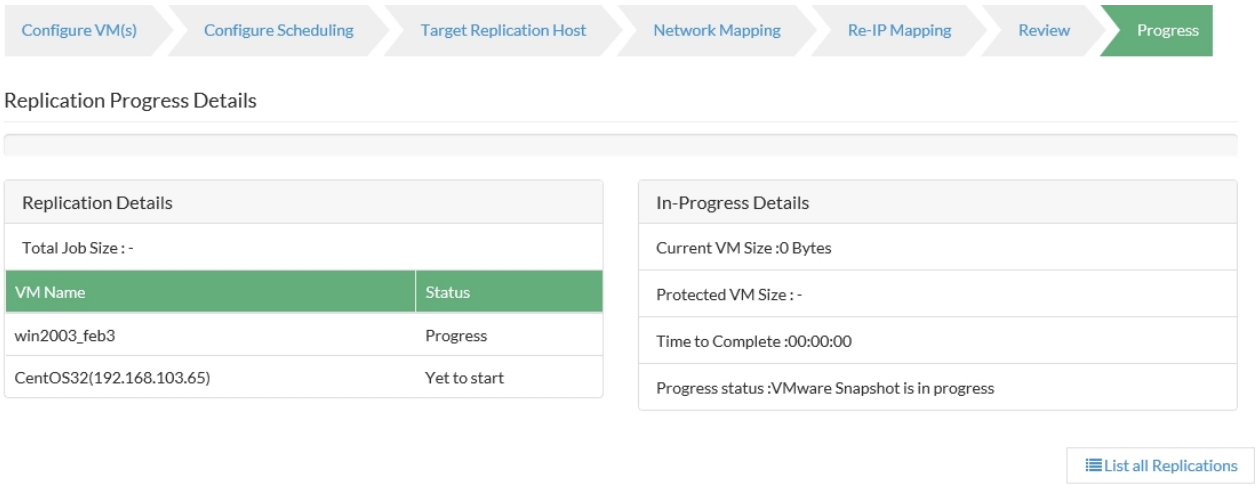
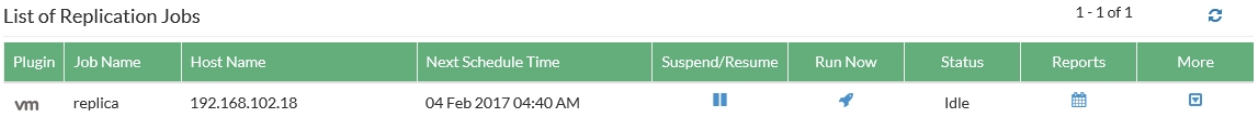


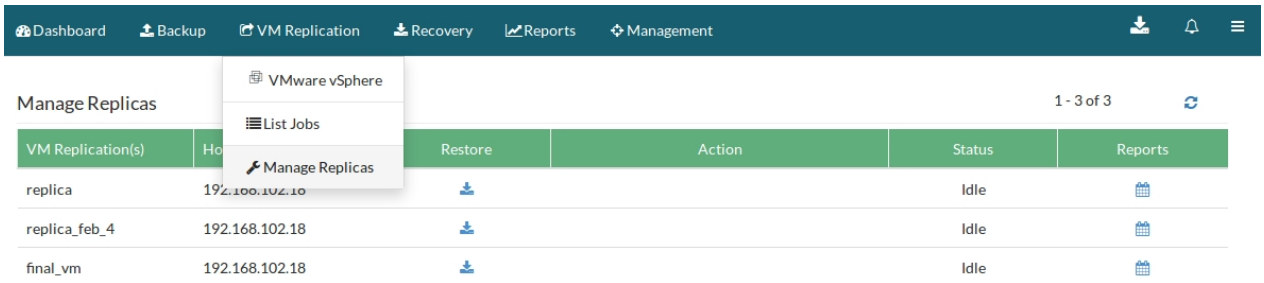
Evaluator's Guide for VMware Backup

Manage Replication Jobs

- Go to VM Replication → List Jobs.
- This page lets users to view, run, suspend, delete and edit the replication jobs configured. Users can also view historical report of individual replication job.



- Go to VM Replication → Manage Replicas.



- You will be directed to page with the list of replication jobs configured from Vembu BDR server.

- This page lets you to perform FailOver & FailBack processes for the replicated VMs.

Visit the following page for steps to restore replicated VMs: Click Here

Evaluator's Guide for VMware Backup

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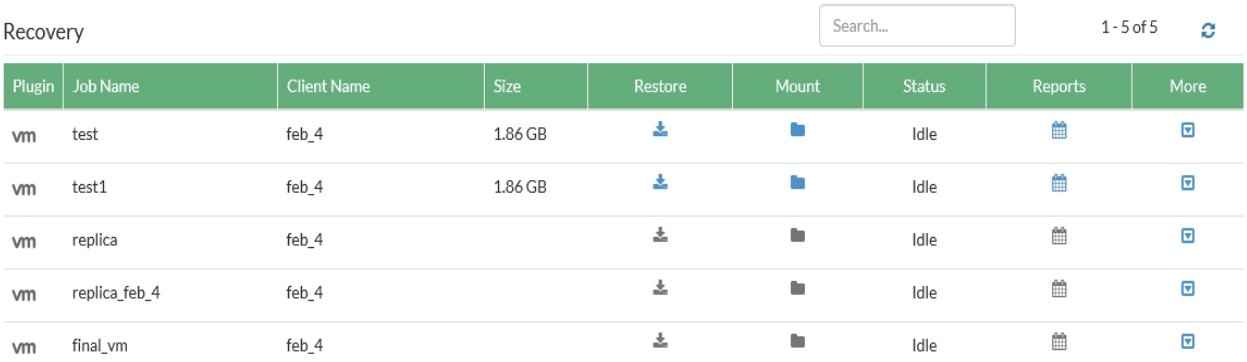
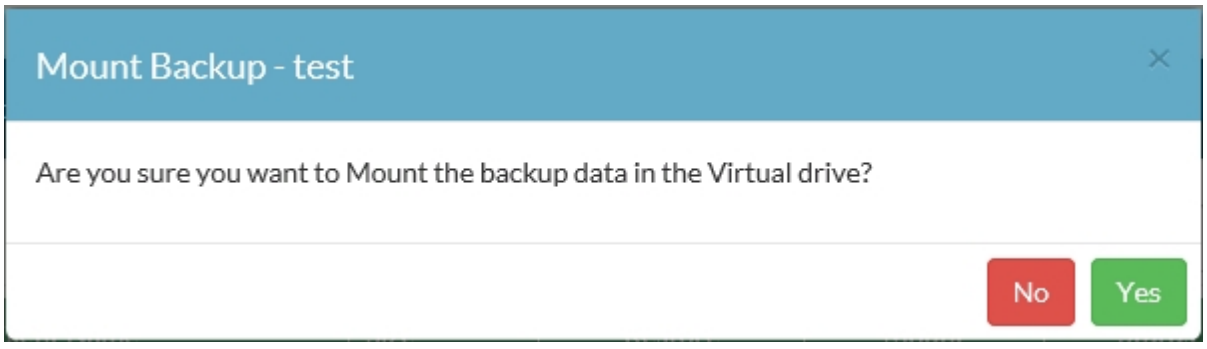
Disaster Recovery

- Go to Recovery tab.
- Backups configured from various client machines to the server, will be listed for recovery, along with below listed options:
    - Restore
    - Virtual mount
    - Proceed to Persistent Instant Boot version delete
    - Delete
    - Replication actions
    - Status
    - Reports



Virtual mount:

- This option lets you instant mount backup data virtually where users can access backup in different file formats such as: IMG, VHD, VHDX, VMDK.



- Users can either take a copy of this mounted data or boot respective files if needed on KVM(IMG file in Linux), VMware vSphere(VMDK) or Hyper-V(VHD, VHDX).
- Once done with requirement, unmount backup data. This will resume backup job, so that incrementals will run as per schedule.

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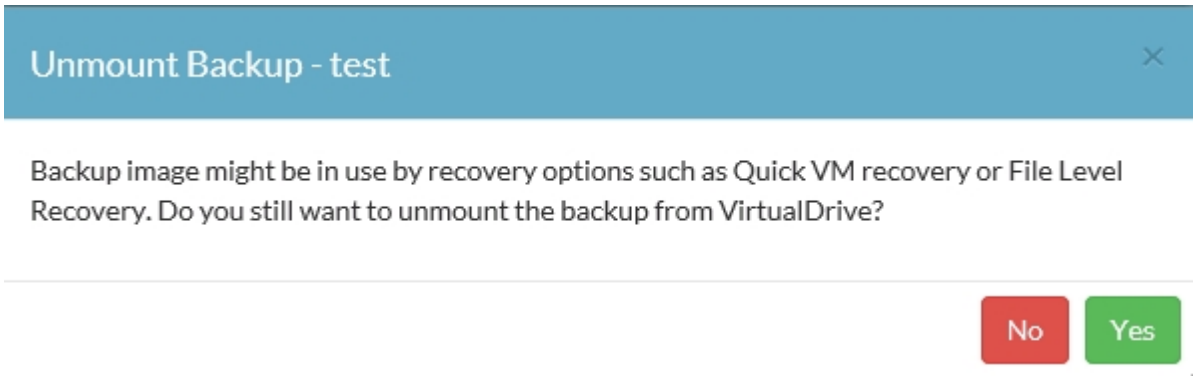
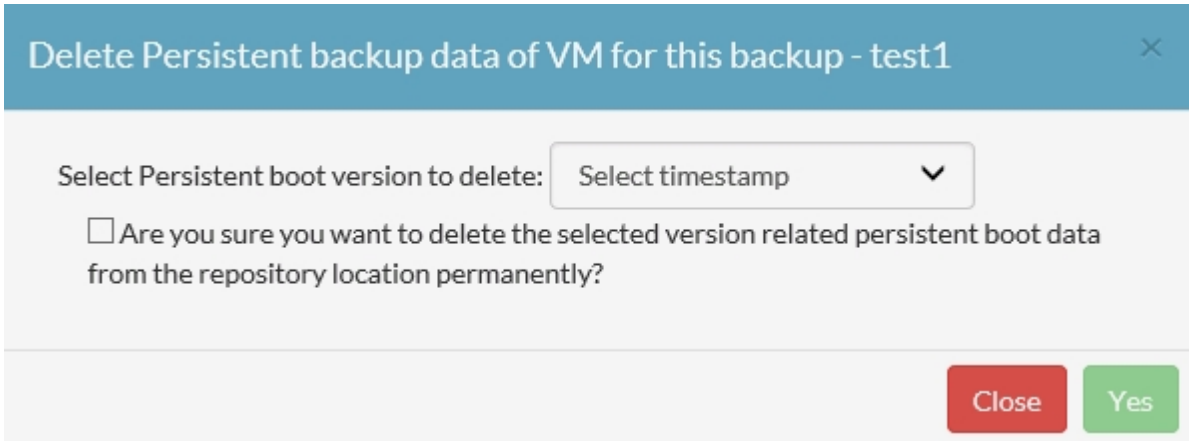


Proceed to Persistent Instant Boot version delete:

- During each instant boot and instant file recovery session, a change in backup data will take place which then is saved as persistent Instant boot data.
- Persistent data can be restored using restore options, if needed.
- Persistent data will be listed with a (+p) sign alongside timestamps of backup versions.
- Such persistent data can also be deleted if not required, using the 'Proceed to Persistent Instant Boot version delete' option.
- The option let user choose the timestamp of persistent data to be deleted.
- User will also be required to confirm deletion by selecting the checkbox 'Are you sure you want to delete the selected version related persistent boot data from the repository location permanently?' to proceed with deletion process.



Restore:

- Proceeding with restore option will list below restore options to choose from:
  - Quick VM Recovery
  - Live Recovery to ESX(i) server
  - File Level Recovery
  - Disk Level Recovery
  - Download

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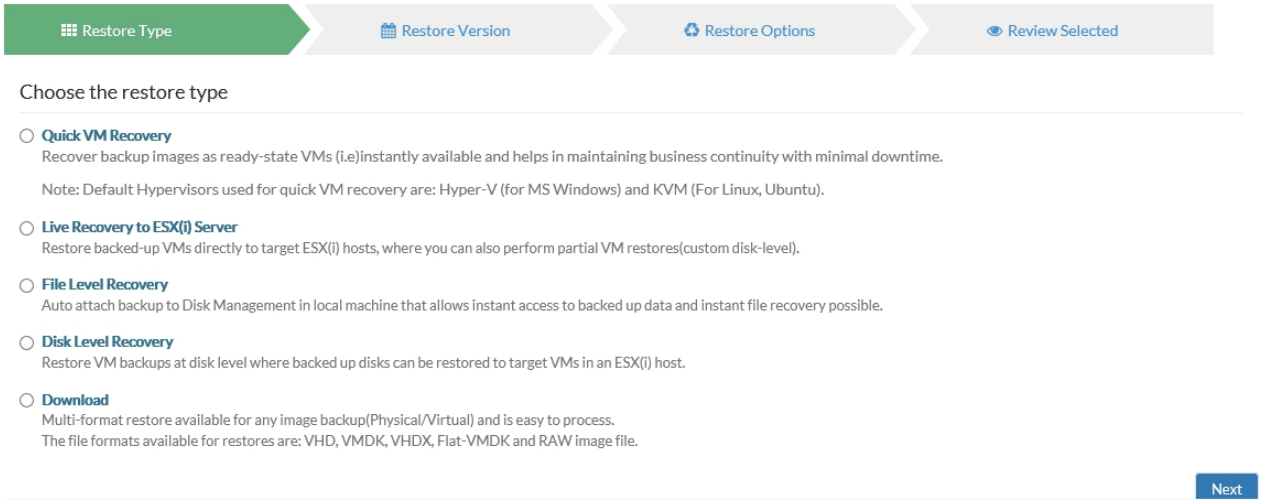


Evaluator's Guide for VMware Backup

Quick VM Recovery

Quick VM recovery option allow user to quick access backup images as ready state VMs. (i.e) Minimal downtime and business continuity secured by making VMs instantly available. Quick VM recovery gives 3 choices of instant boot software to users:

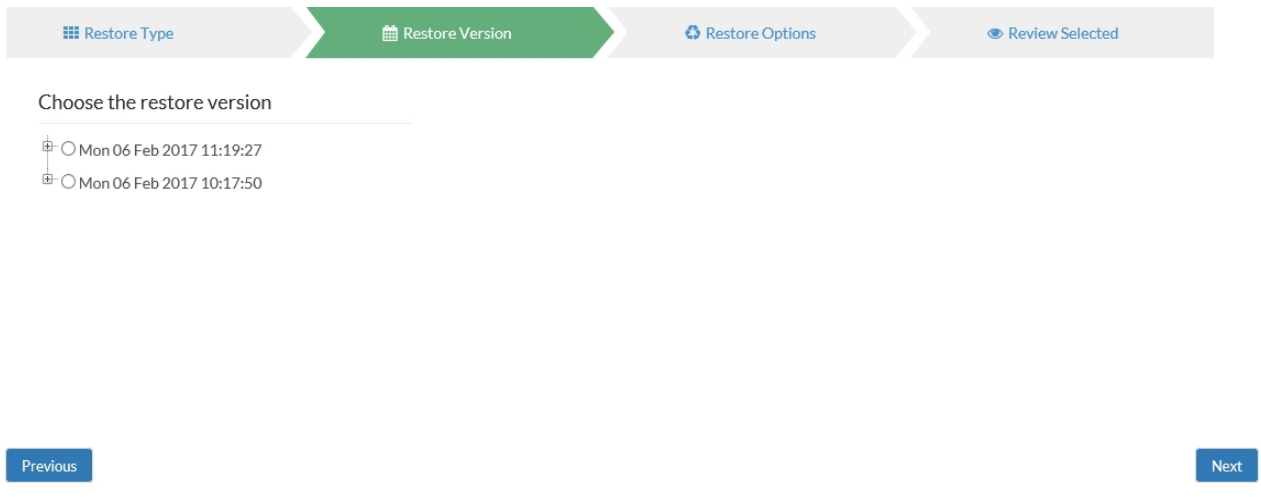
- VMware (Available in both Windows and Linux servers as an alternate software for instant boot)
- Hyper-V (Default chosen software for Windows and available only on Windows servers)
- KVM (Default chosen software for Linux and available only on Linux servers)

Evaluator's Guide for VMware Backup

VMware

Login to Vembu BDR server installed in a Windows/Linux environment and go with 'Quick VM Recovery' among recovery options.

- Proceeding with Quick VM recovery option will let you select version for Instant Boot.



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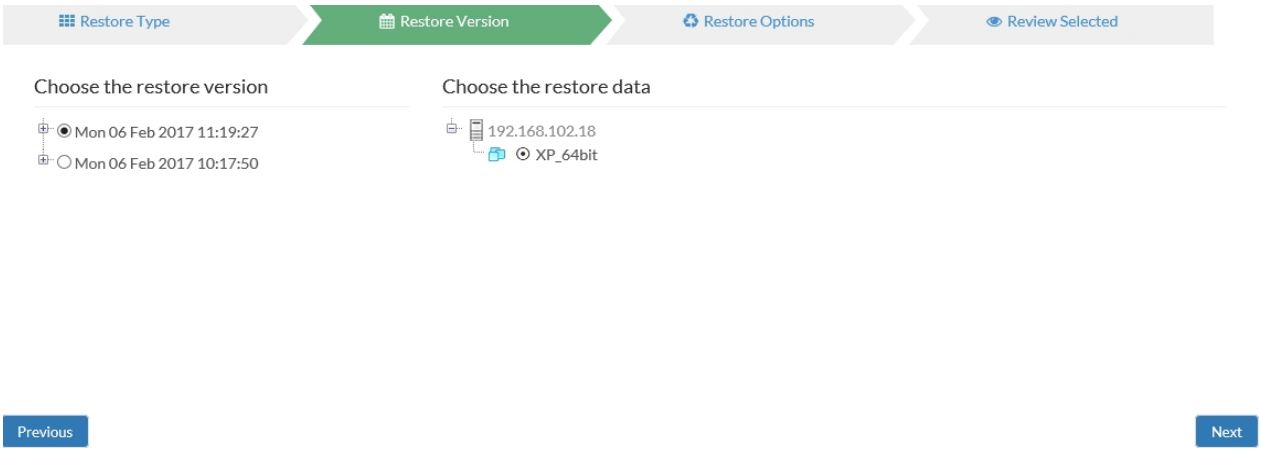
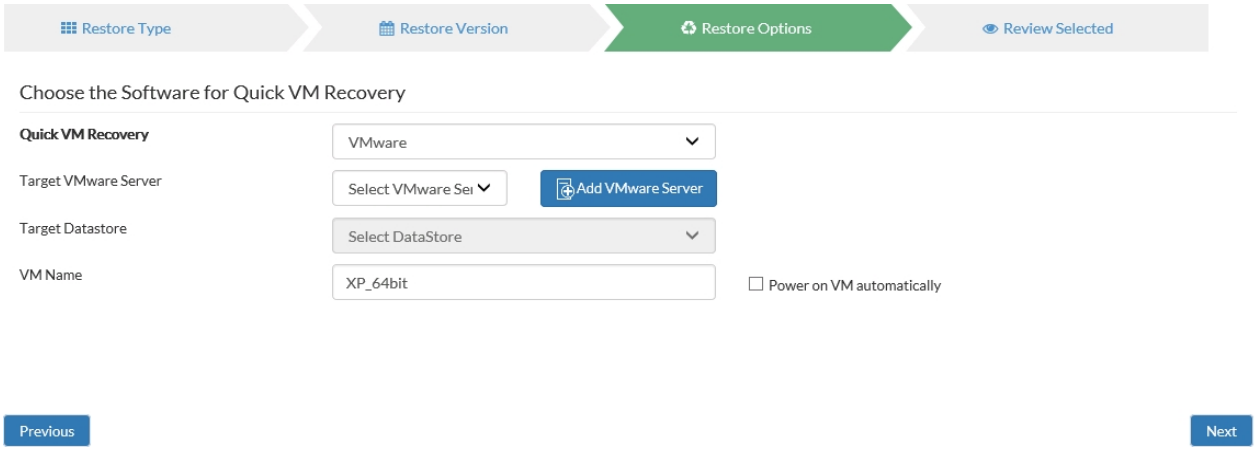
- Once done choosing required timestamp, proceed to select the virtual machine to boot.
- From the list of VM(s) select the VM to instant boot and proceed to configure in which VMware server to boot.



- User can choose VMware as software for instant boot (In both Windows and Linux servers) and need to enter the necessary details to instant boot in VMware environment..
- In order to proceed with instant boot via ESXi/vCenter server, user have to choose: target VMware server and target datastore. User will also be requested to provide a VM name(which by default takes name of VM to be restored).
- User can also specify whether the VM should be powered ON automatically.



- Once done configuring VMware server details, proceed to review configuration.

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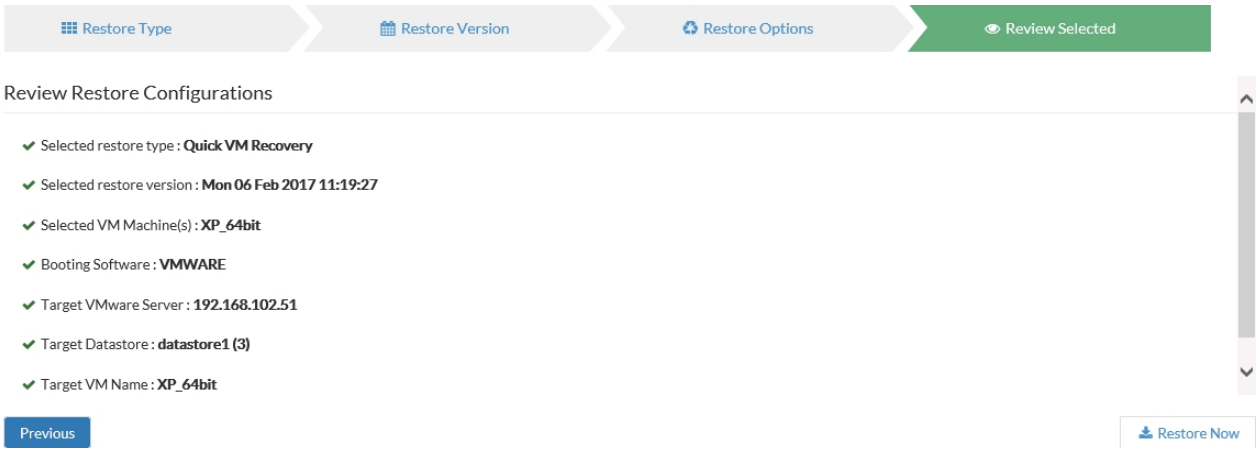
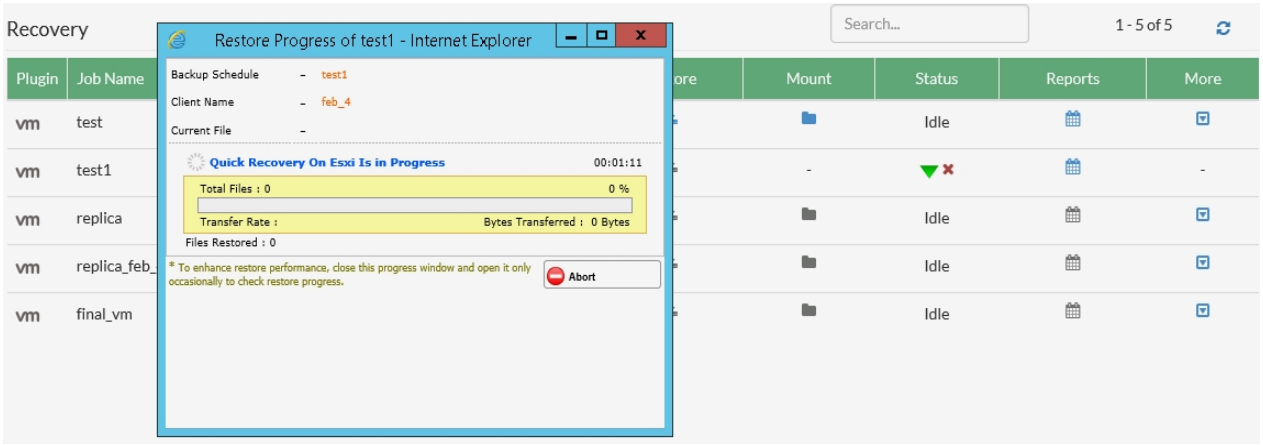


- Once done reviewing, click Next to proceed with Instant Booting the VM.



- VM will get automatically created in VMware server VMs list.
  Note: Once done with requirement, shutdown and turn off VM before unmounting backup data. This will resume backup job, so that incrementals will run as per schedule.

Evaluator's Guide for VMware Backup

Hyper-V

Login to Vembu BDR server installed in a Windows environment and go with 'Quick VM Recovery' among recovery options.

- Proceeding with Quick VM recovery option will let you select version for Instant Boot.

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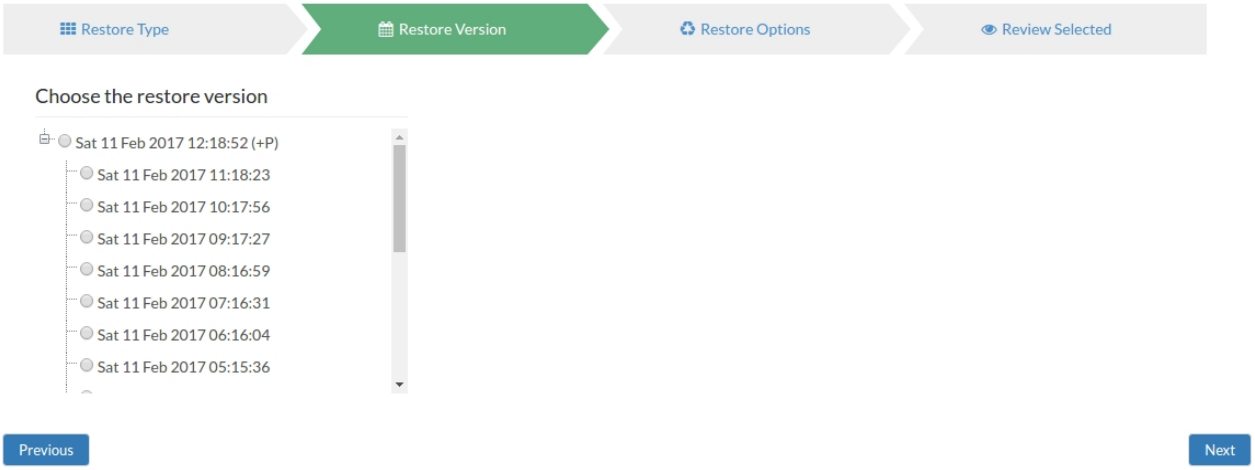
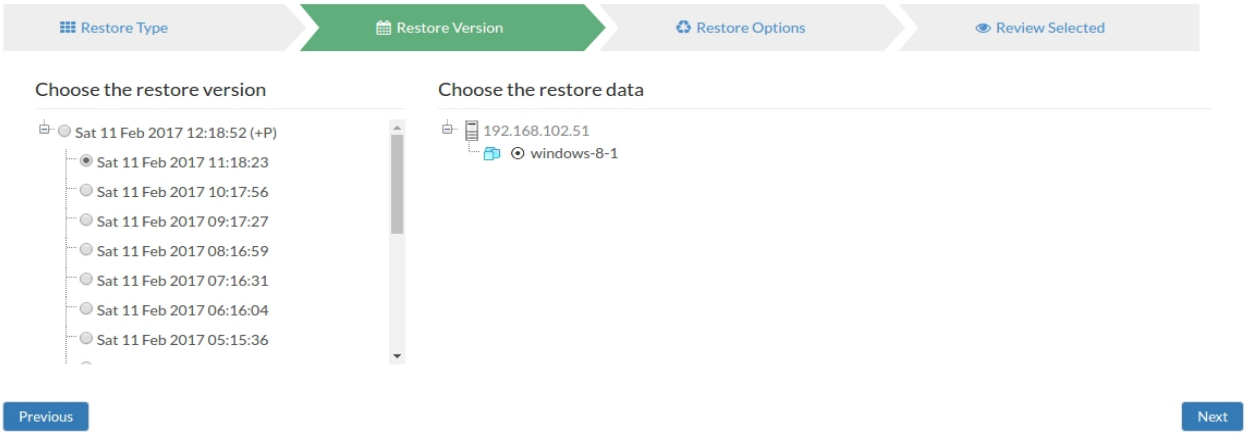
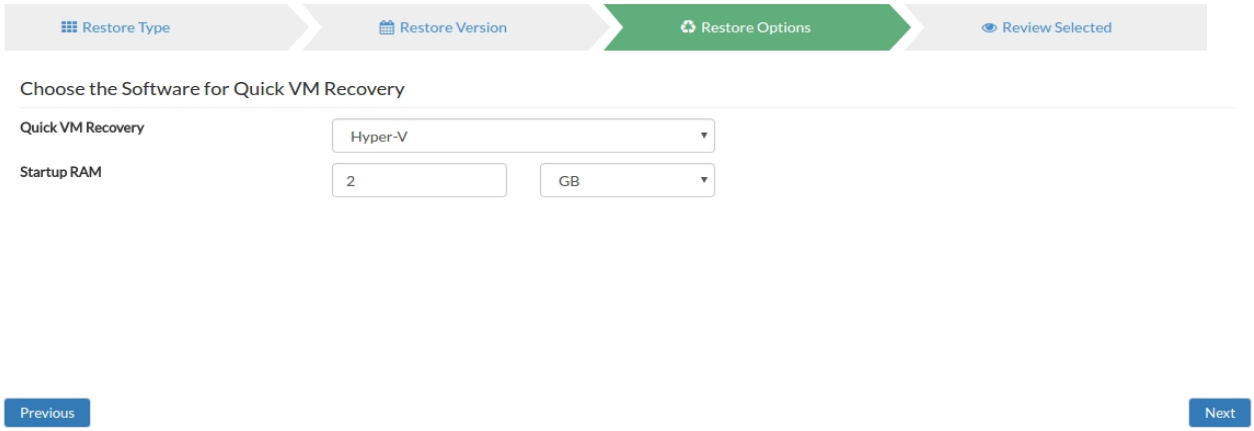


- Once done choosing required timestamp, proceed to select the virtual machine to boot.
- From the list of VM(s) select the VM to instant boot and proceed to allocate RAM for Instant boot.



- The software used to instant boot is Hyper-V (For Windows servers) and the default RAM size chosen is 2 GB which can be modified based on user requirement.



- Once done configuring restore options, proceed to review configuration.

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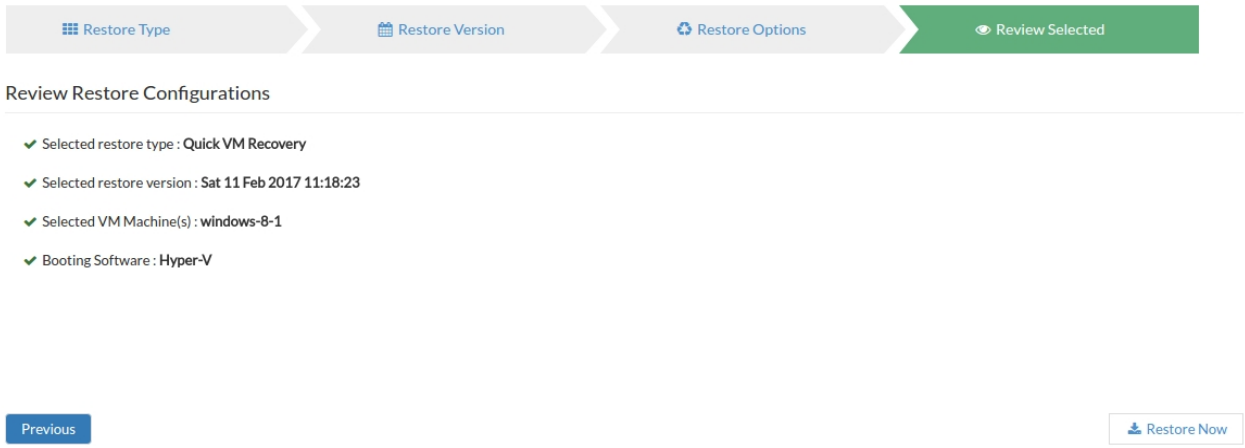
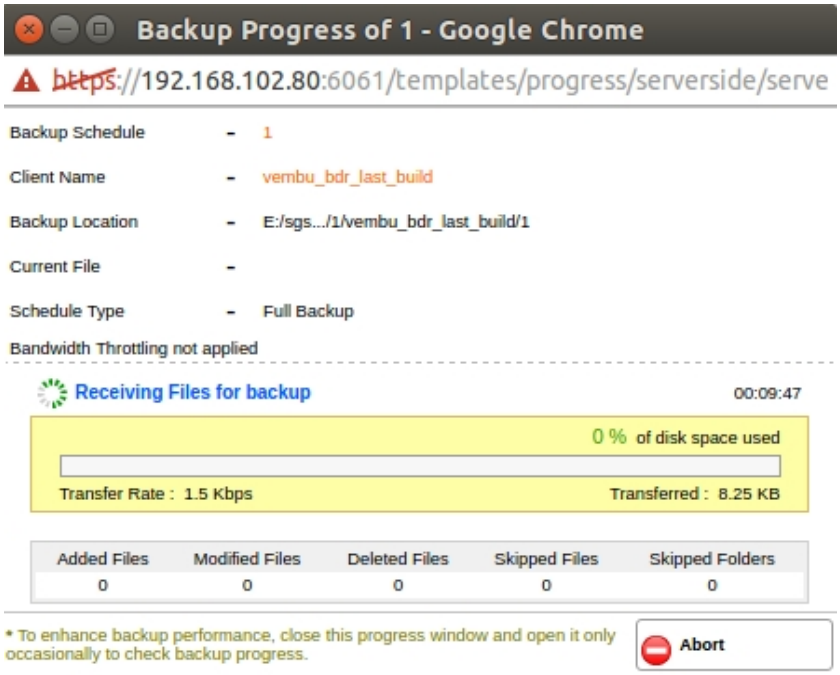


- Once done reviewing, click Next to proceed with Instant Booting the VM.



- VM will get automatically created in Hyper-V VMs list.
  Note: Once done with requirement, shutdown and turn off VM before unmounting backup data. This will resume backup job, so that incrementals will run as per schedule.

Evaluator's Guide for VMware Backup

KVM

Login to Vembu BDR server installed in a Linux environment and go with 'Quick VM Recovery' among recovery options.

- Proceeding with Quick VM recovery option will let you select version for Instant Boot.

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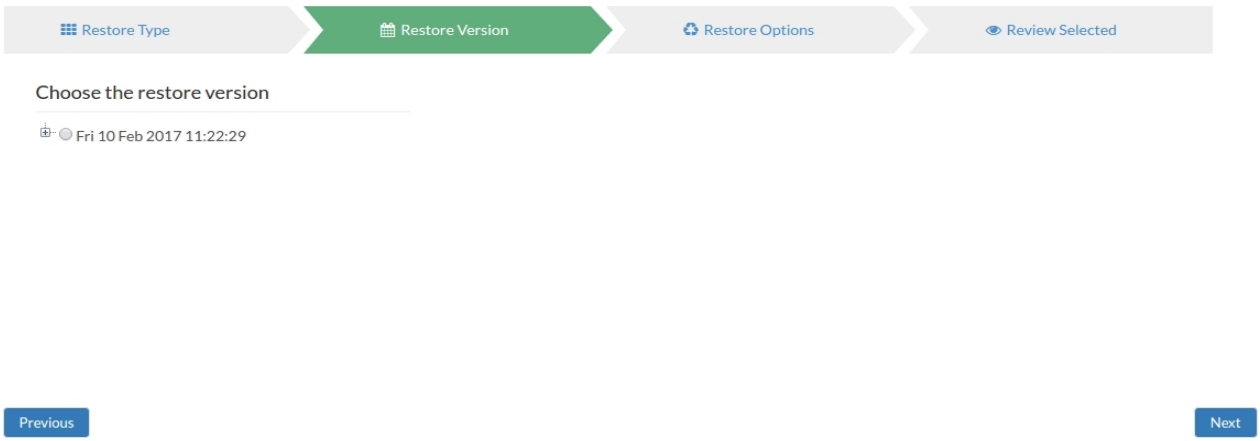
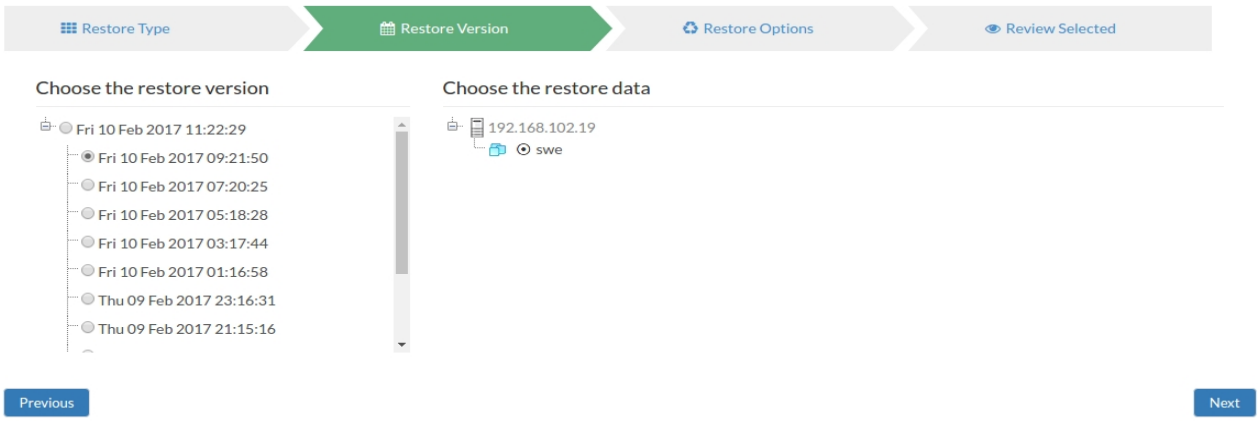
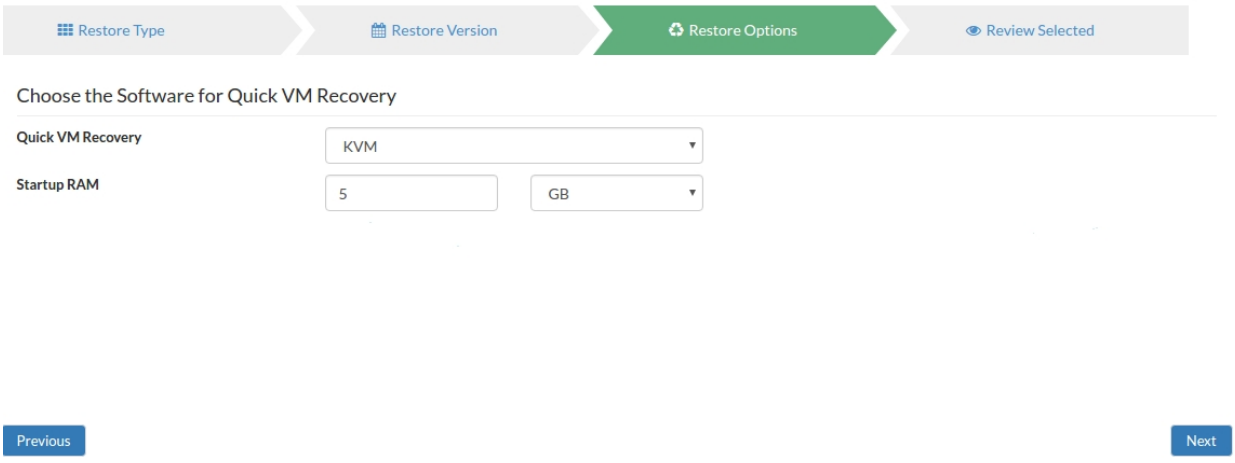


- Once done choosing required timestamp, proceed to select the virtual machine to boot.
- From the list of VM(s) select the VM to instant boot and proceed to allocate RAM for Instant boot.



- The software used to instant boot is KVM (For Linux servers) and the default RAM size chosen is 2 GB which can be modified based on user requirement.



- Once done allocating RAM size, proceed to review configuration.

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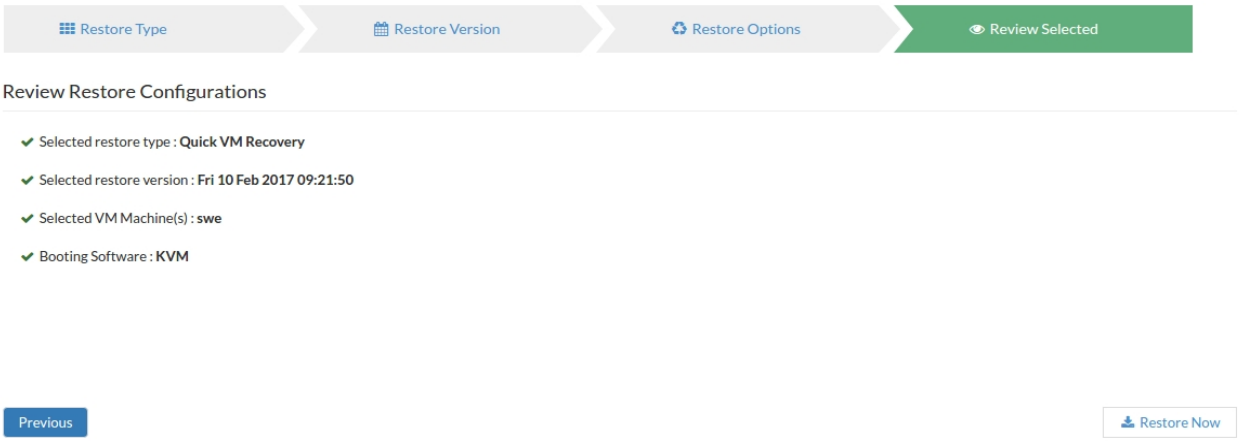
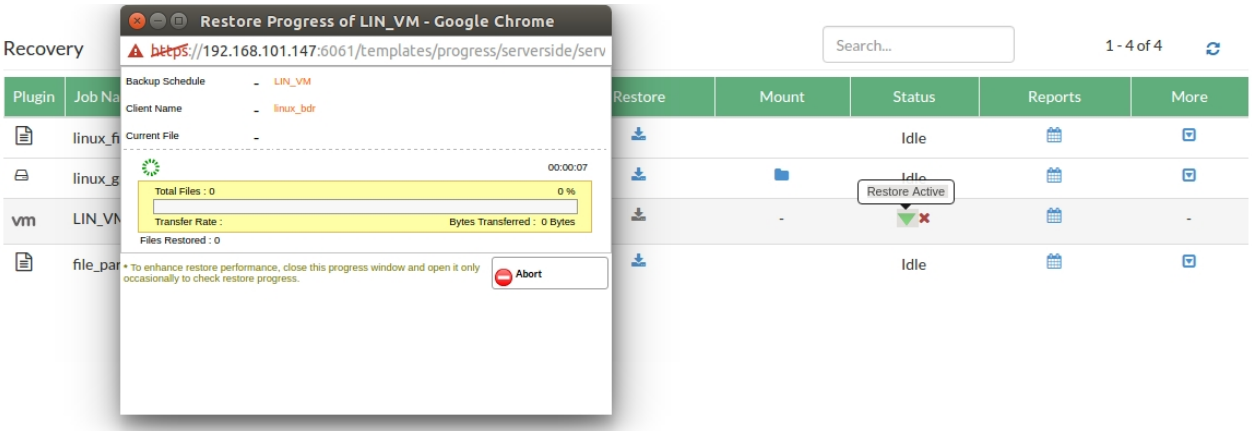


- Once done reviewing, click Next to proceed with Instant Booting the VM.



- VM will get automatically created in KVM VMs list.
  Note: Once done with requirement, shutdown and turn off VM before unmounting backup data. This will resume backup job, so that incrementals will run as per schedule.

Evaluator's Guide for VMware Backup

Instant File Recovery

This option lets you instantly attach backup data to disk management as a VHD/VHDX file and proceed with file level restore.

- The VHD/VHDX file is created by virtual mounting backup data.
- Users can access backup data via disks attached on disk management.
- Once done with requirement, unmount backup data. This will resume backup job, so that incrementals will run as per schedule.

- Select the timestamp version for file level recovery and proceed

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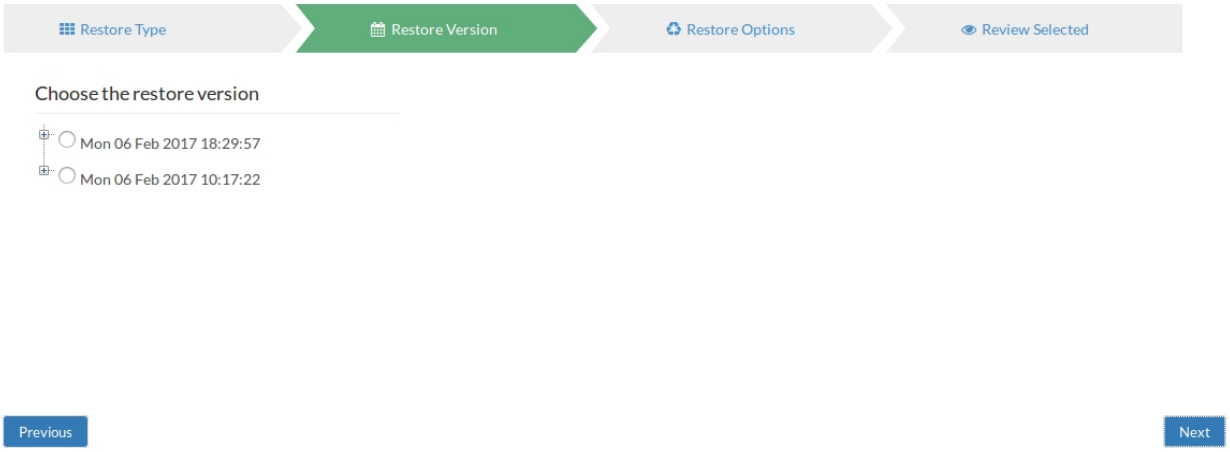
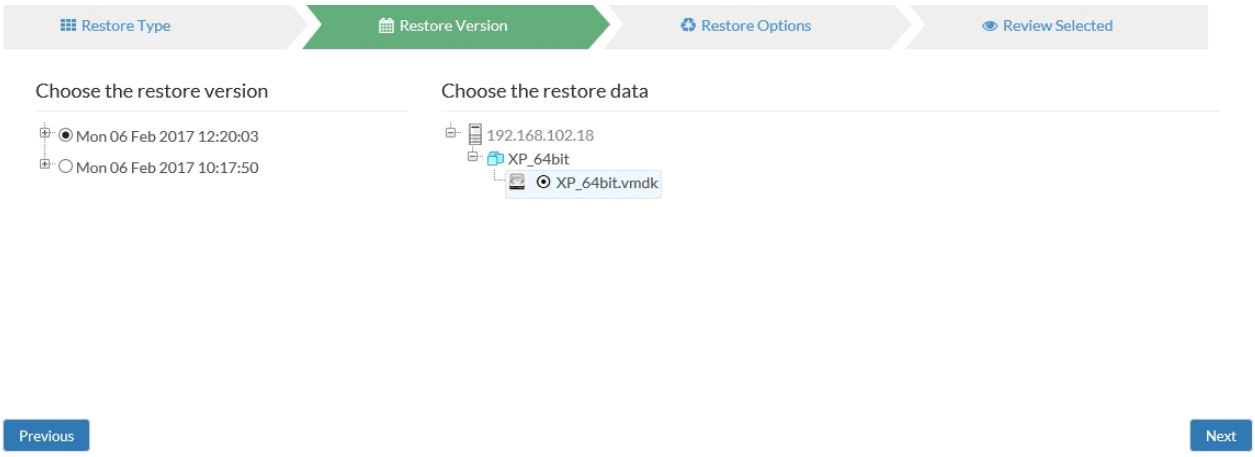
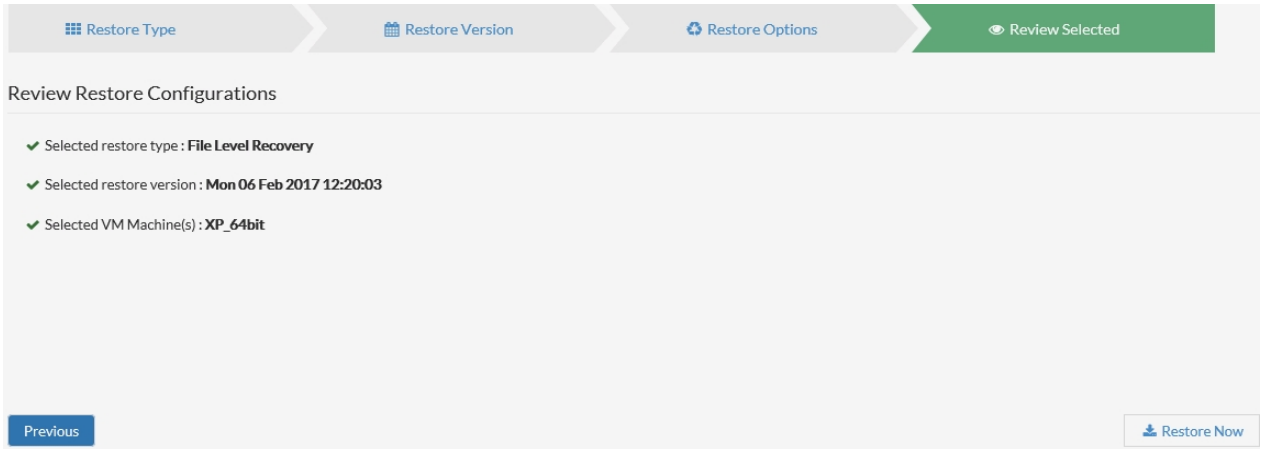


- Select the backup data to be mounted in disk management for file level restore.



- Once done configuring restore options, proceed to review configuration.



- Once done reviewing, click Next to proceed with File Level Recovery.

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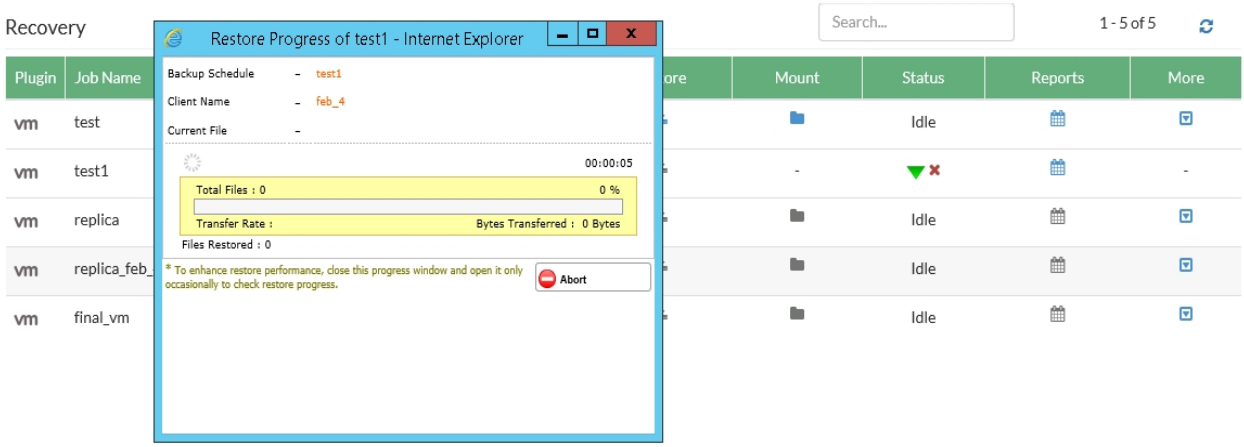
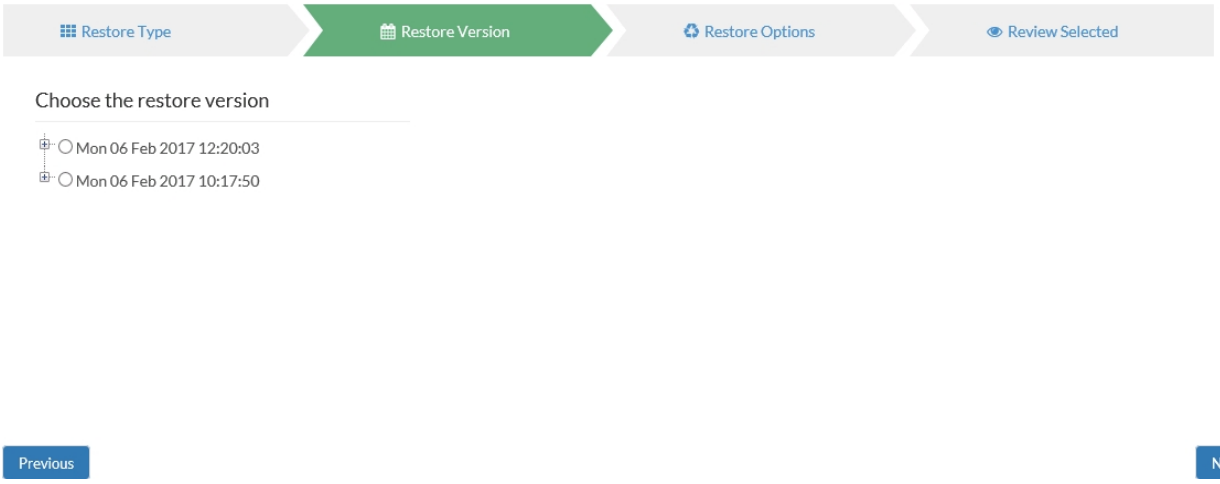


Evaluator's Guide for VMware Backup

Full VM Recovery to ESXi Host or vCenter Server

- Proceeding with 'Live Recovery to ESX(i) Server' option will let you select Version for Live ESXi Server restore, where you have VMware backup with several timestamps.
- Choose your required timestamp version and proceed to select VM.



- If you have backed up more than one VM in a backup and need to restore a particular VM/set of VMs, among all other VMs- Select your desired VM(s) and hit proceed to provide target ESXi details.

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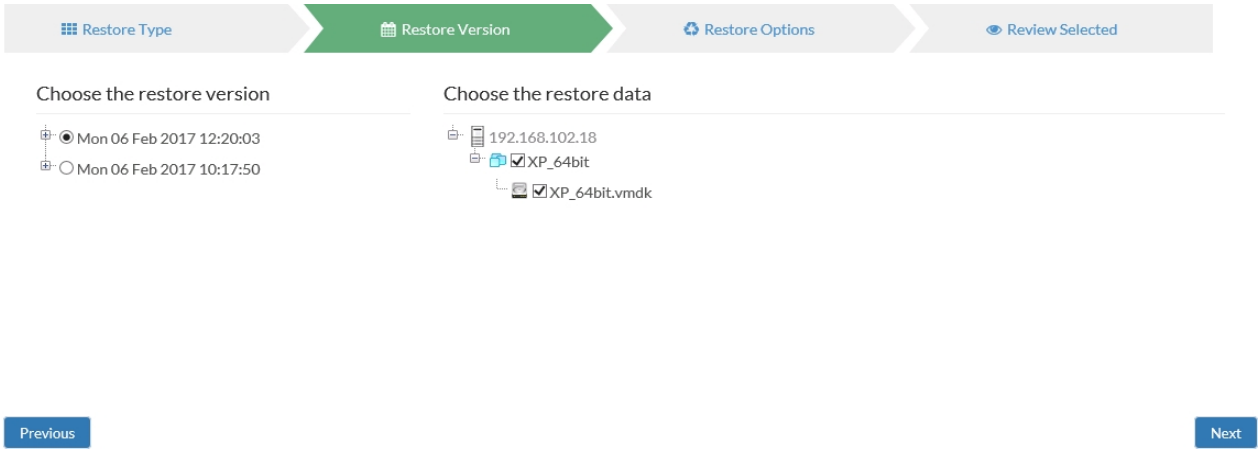
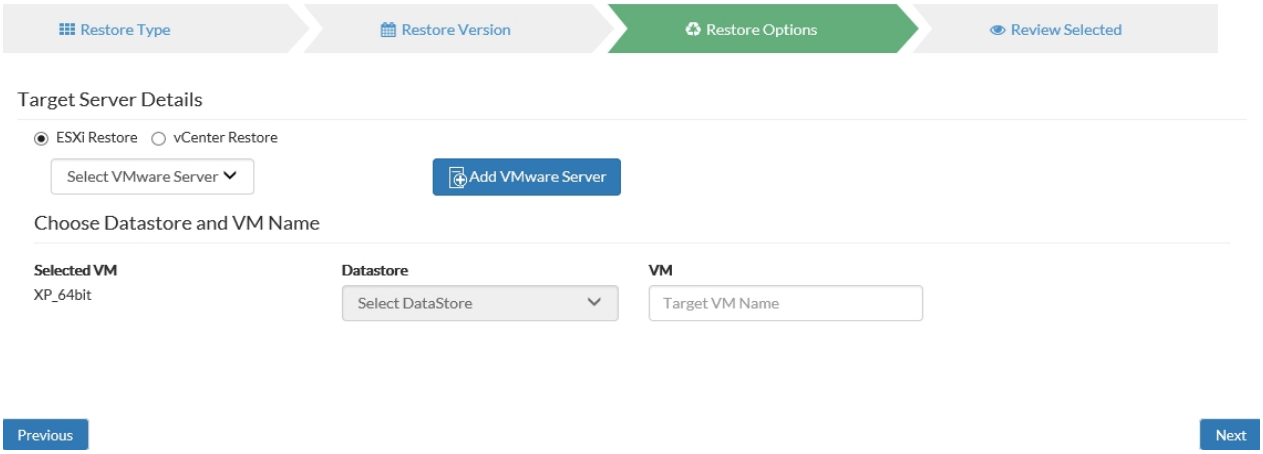
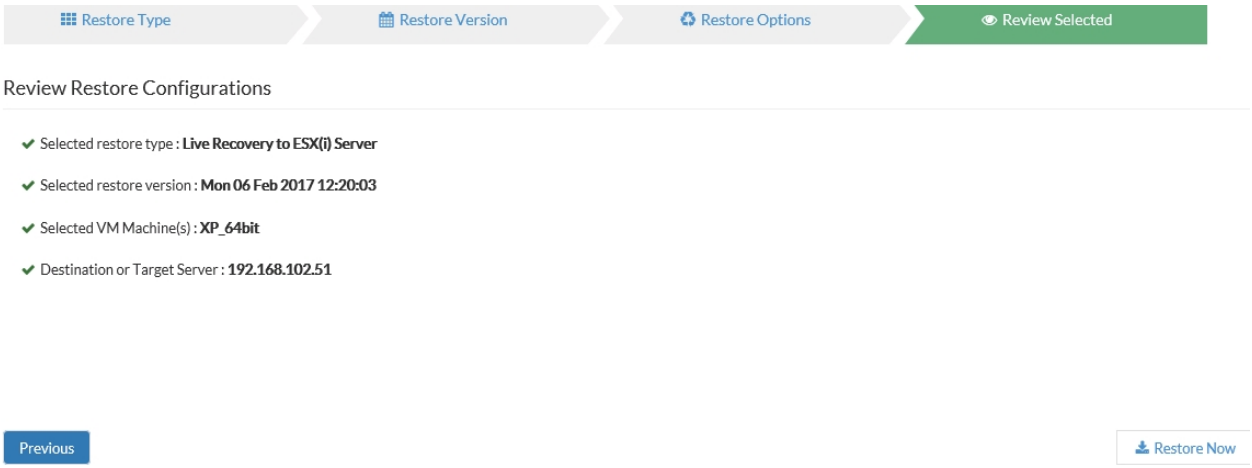


- Choose the target server(ESXi/vCenter) for VM restore from the dropbox(if already registered in manage VMware vSphere server page). If not registered, add the server details using 'Add VMware Server' option.
- Choose target host(if restoring to vCenter) and target datastore details.
- Provide a name for the target VM to be created.



- Once done configuring restore options, proceed to review configuration.



- Once done reviewing, click Next to proceed with Live Recovery to ESX(i) Server.

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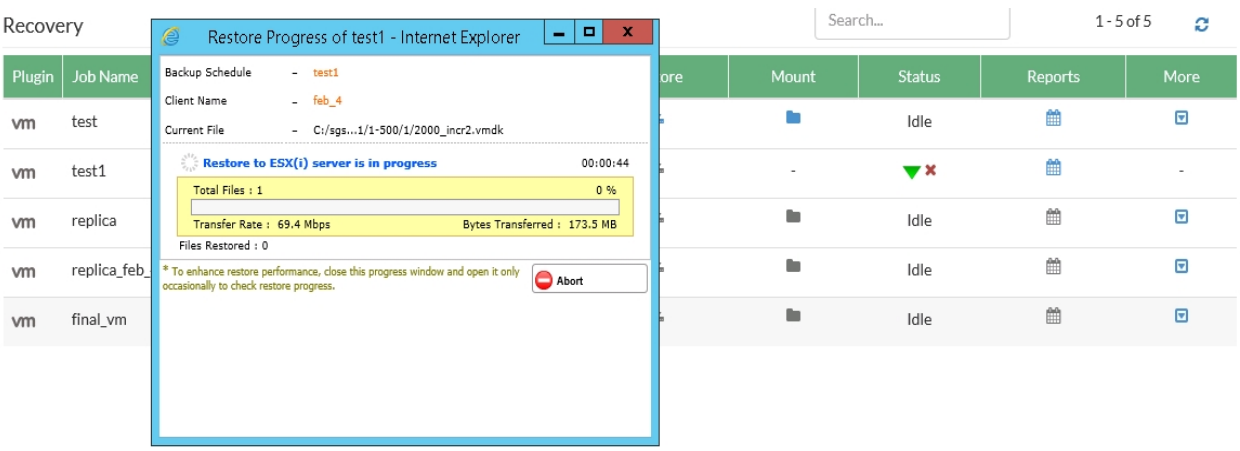
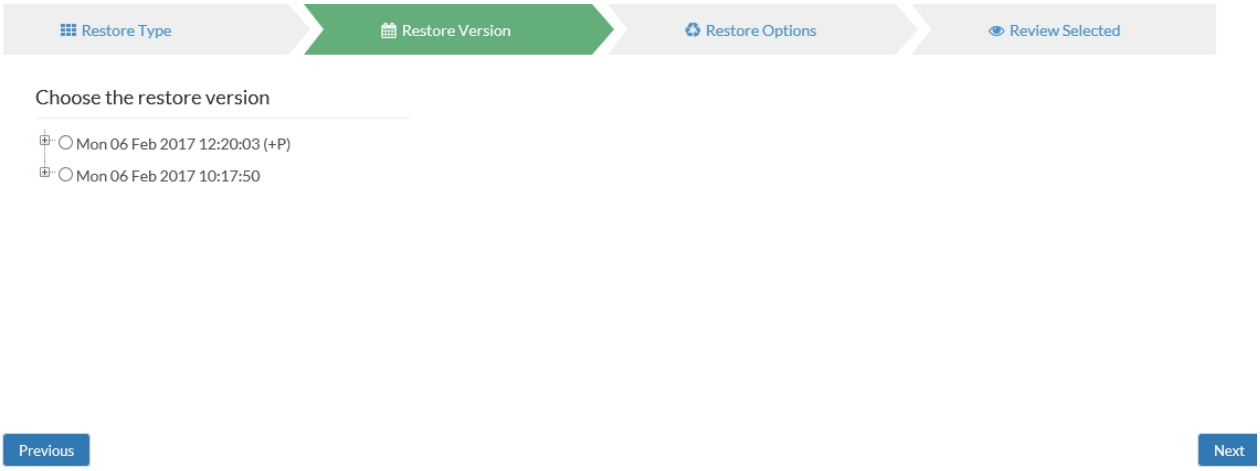


Evaluator's Guide for VMware Backup

Disk Level Recovery

- This option lets users restore specific disk from existing VM backup to a target virtual machine. So that the disk can be attached and accessed by that target VM.
- Proceeding with the option VM disk restore, requests user to select time-stamp version for VM disk restore. Once done selecting, click proceed to select virtual machine(s).



- Select the required disks of VM(s) you want to restore and click proceed to provide target ESXi details.

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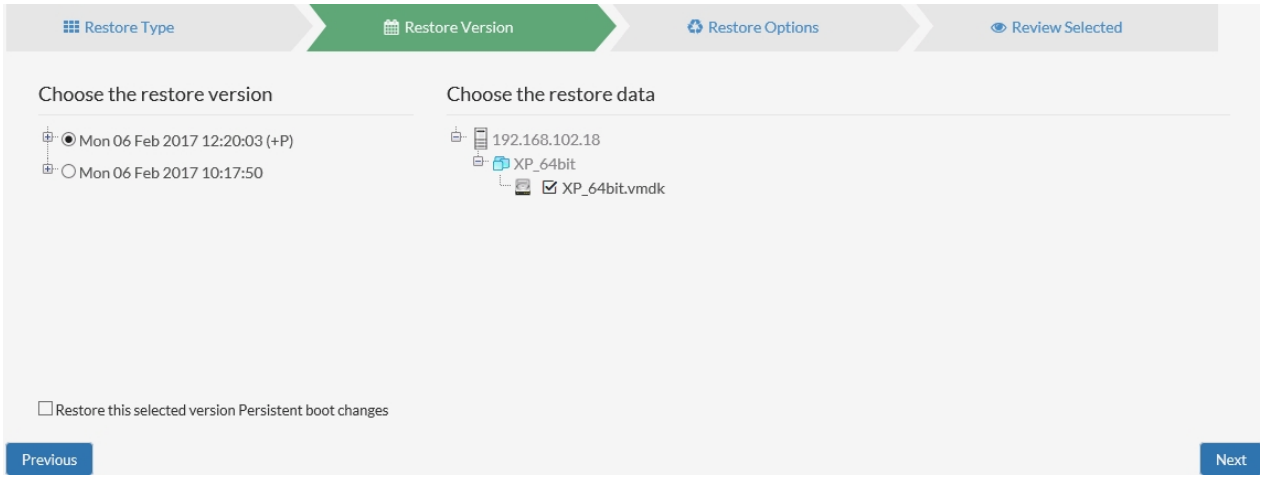
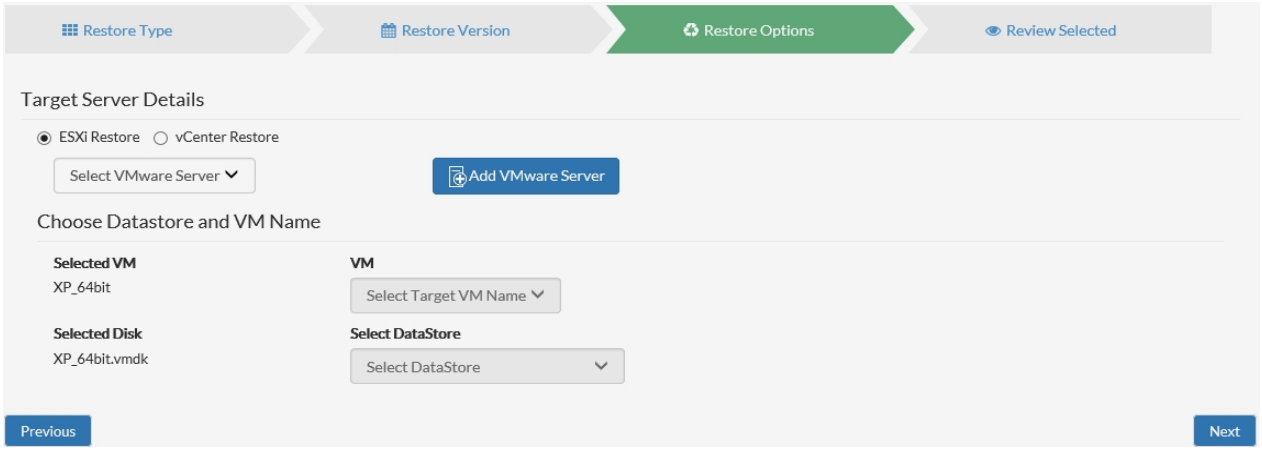
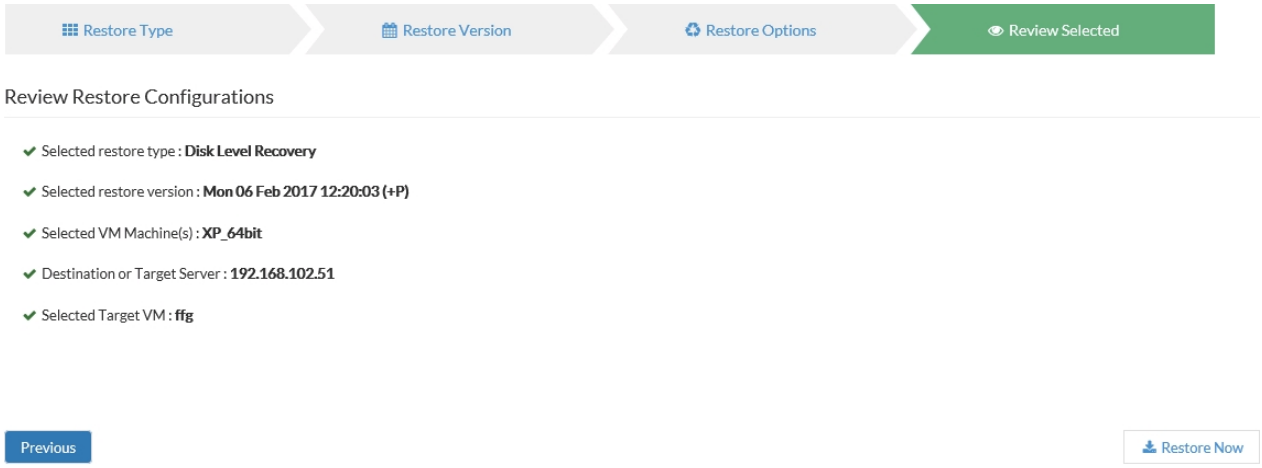


- Choose the target server(ESXi/vCenter) for VM restore from the dropbox(if already registered in manage VMware vSphere server page). If not registered, add the server details using 'Add VMware Server' option.
- Choose target host(if restoring to vCenter) and target datastore details.
- Choose the target VM to which you wish to restore disk.



- Once done configuring restore options, proceed to review configuration.



- Once done reviewing, click Next to proceed with Disk Level Recovery.

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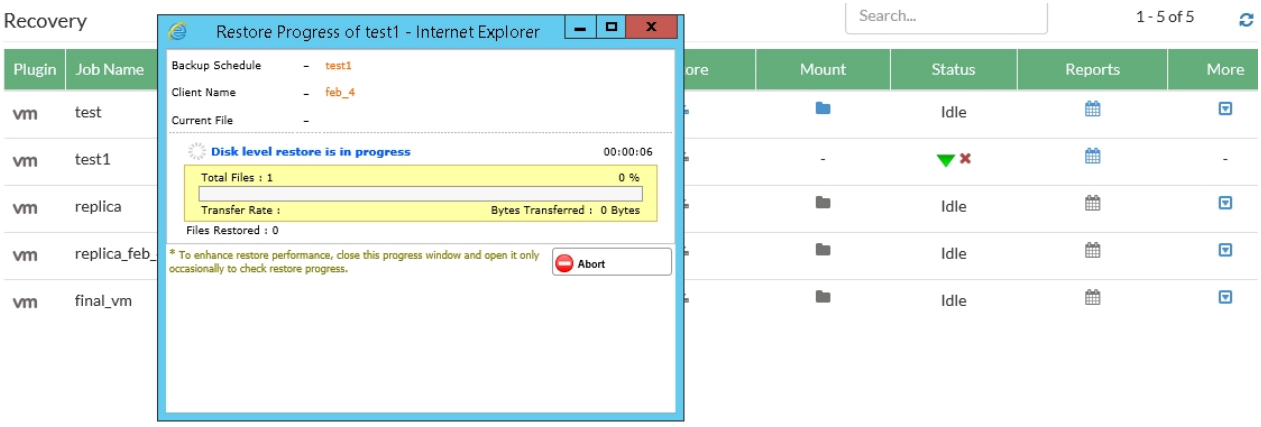
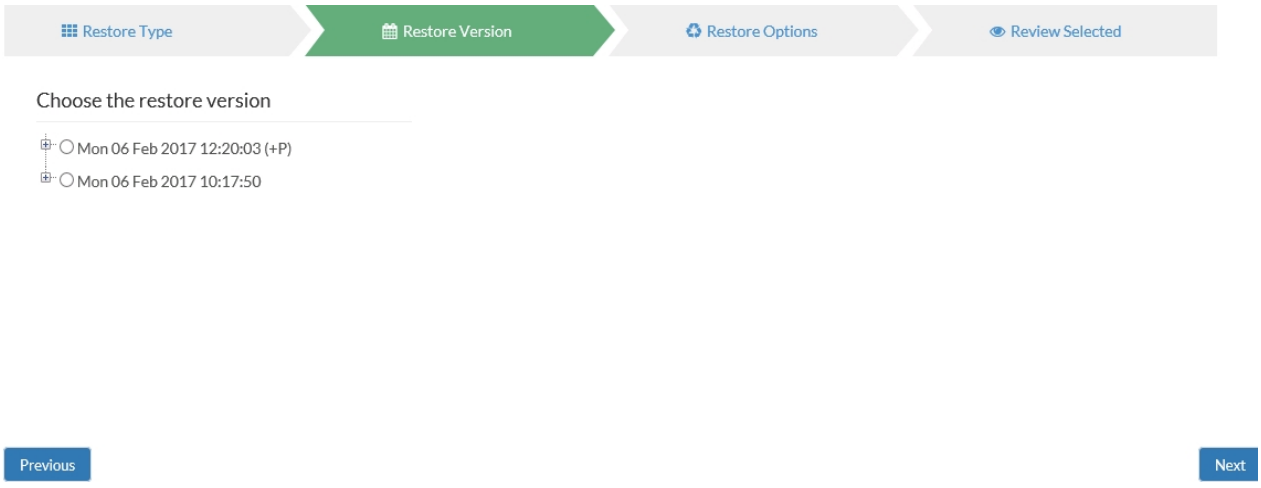


Note: While performing Disk Level restore, target VM will be turned off

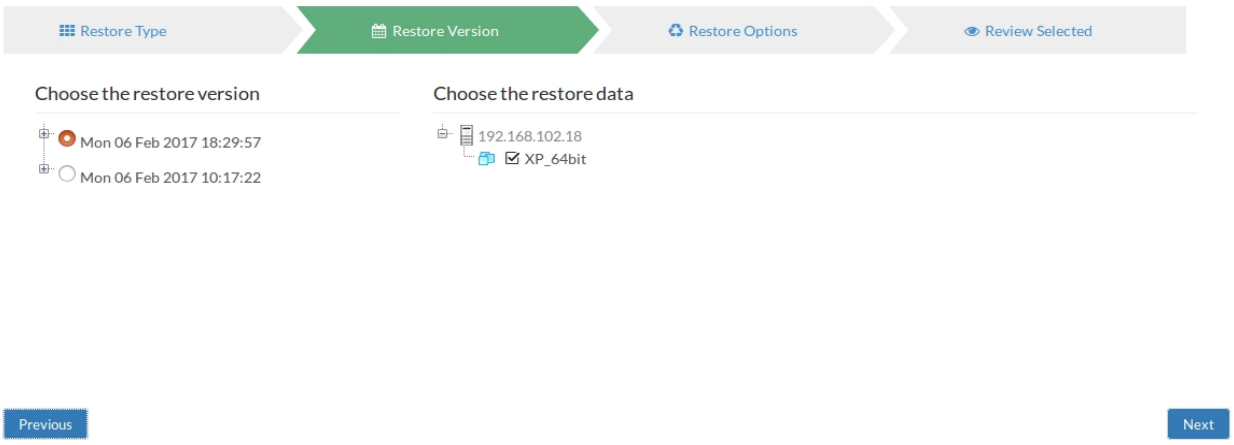
Evaluator's Guide for VMware Backup

Download VM Files

- Download option allows users to download backup data as an offsite copy of their preferred file format.
- Proceeding with restore, lets users go with the regular routine of selecting time-stamp version they want to restore and click proceed.



- Now select VM(s) to restore and proceed to select restore location.



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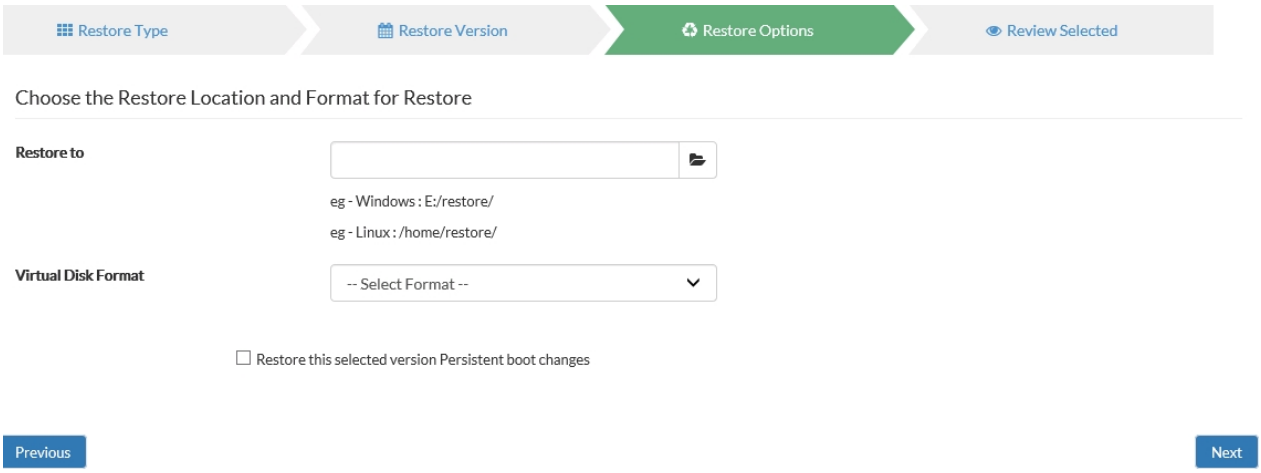
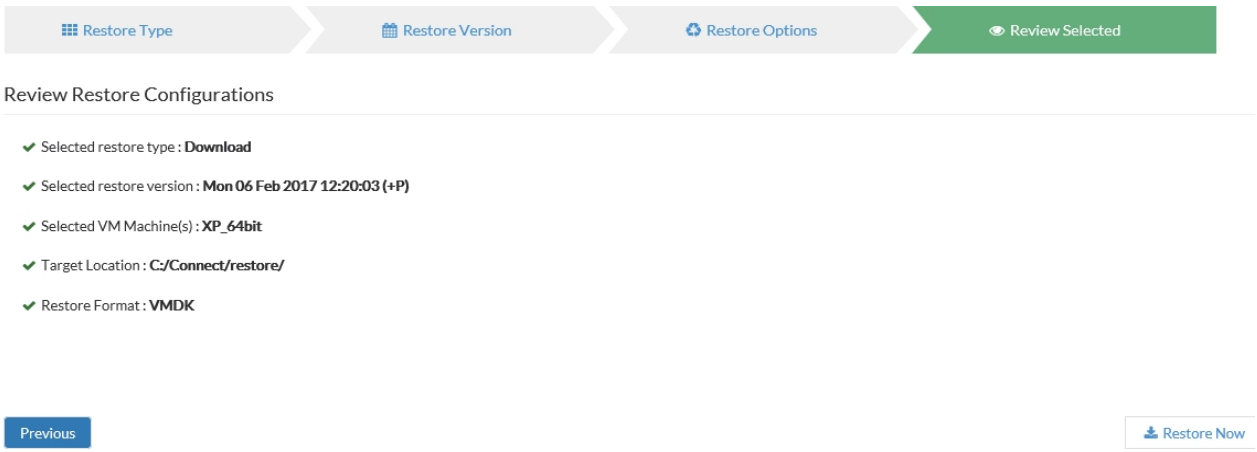
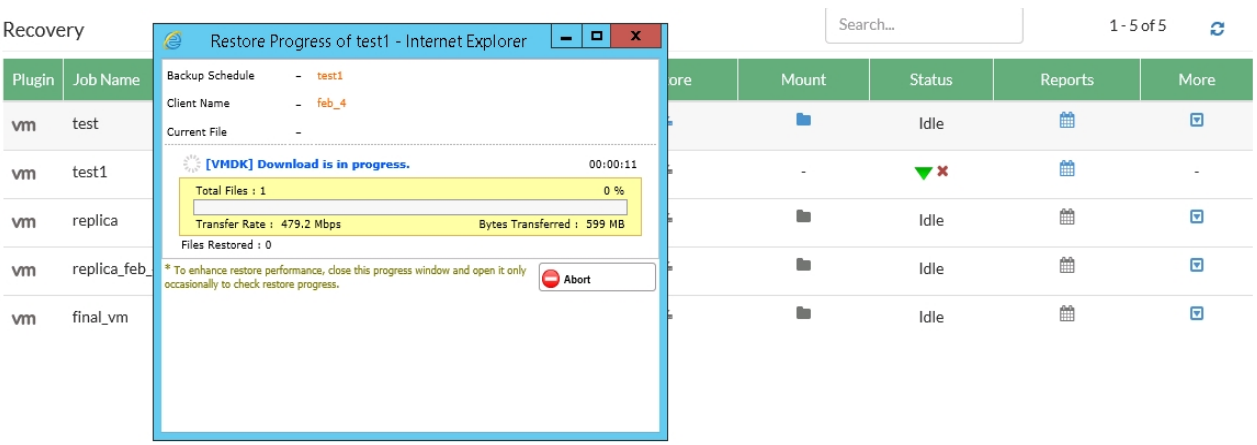
- Restoring location can either be a local drive on backup server or if users have managed to add a network shared drive, the restore can be directed to the network shared location.
- Users can download backup data in multiple file formats such as: VHD, VMDK, VHDX, VMDK-Flat and RAW.



- Once done configuring restore options, proceed to review configuration.



- Once done reviewing, click Next to proceed with Download.



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- Taking offsite copies in various format allow users to boot backup data across various virtual and physical environments such as Oracle Box, KVM, Hyper-V, VMware vSphere, VMware player etc.,
- Also reconstruction of physical servers is also possible with this offline backup copies.

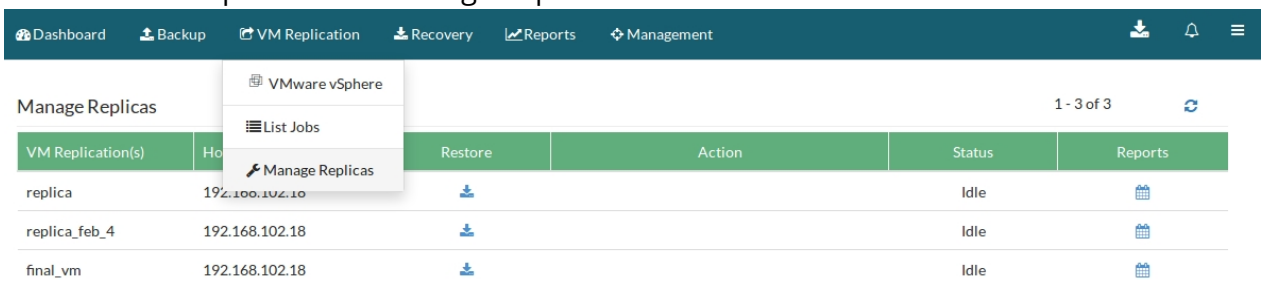
Evaluator's Guide for VMware Backup

Restore type- Failover and Failback:

User can perform Failover and Failback as a recovery process for replications.

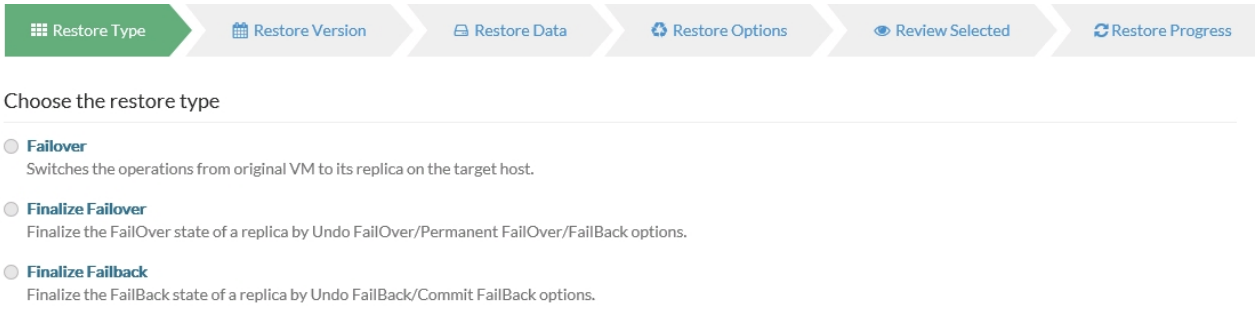
Failover and Failback processes have three phases in which each phase is dependant on the other, where you can initially start with Failovering VMs followed by Finalizing FailOver with finaling types like: Undo FailOver, Permanent FailOver and FailBack which is then followed by Finalize FailBack process (if user have chosen FailBack as finalizing type during Finalize FailOver phase).

- Go to VM Replication → Manage Replicas.



- You will be directed to page with the list of replication jobs configured from Vembu BDR server.

- Proceeding with Restore option will give you three types of restores to choose from:
  - Failover
  - Finalize Failover
  - Finalize Failback



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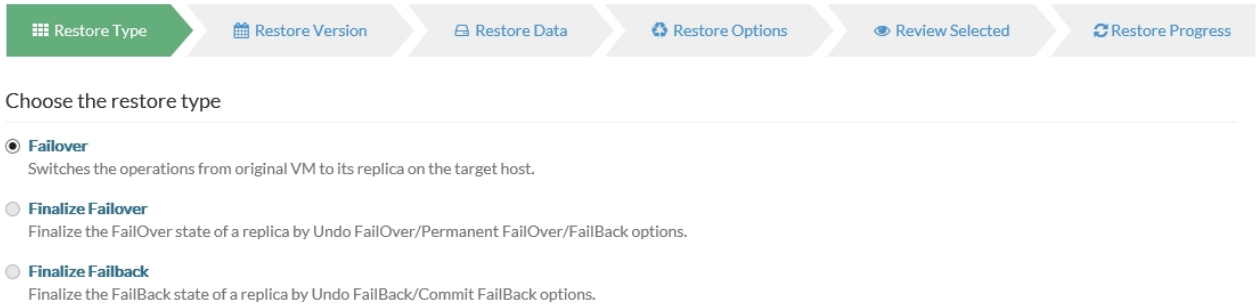
Failover:

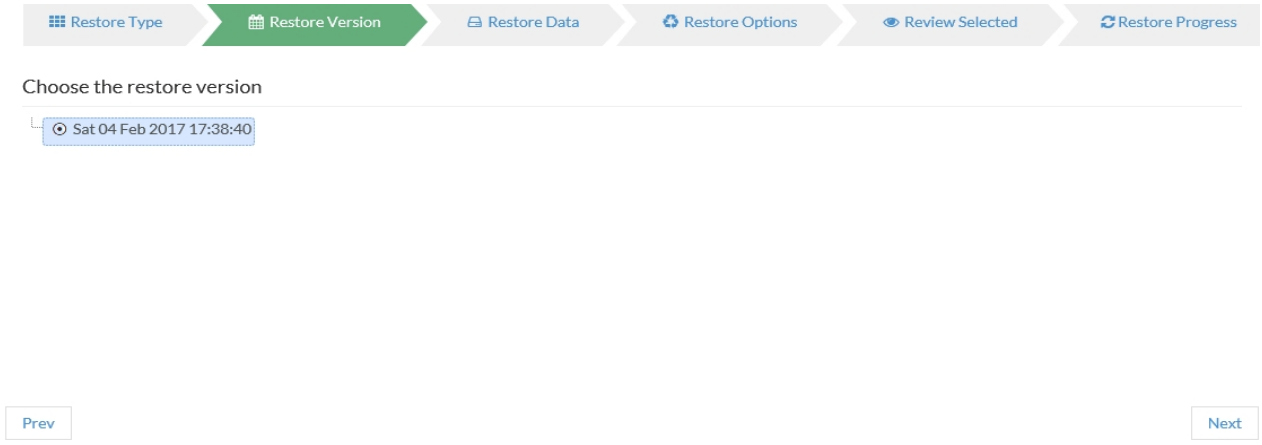
Failover is a process that switches business operations from original VM to its replicated VM on target host, at times of a disaster or based on some other requirement. Follow below steps to Failover virtual machines:

- Proceed with restore type: Failover.



Restore Version:

- Choose a restore version from the list of available timestamps and proceed.



Restore Data:

- From the list of replicated VMs, select the virtual machines you wish to restore for Failover and proceed.

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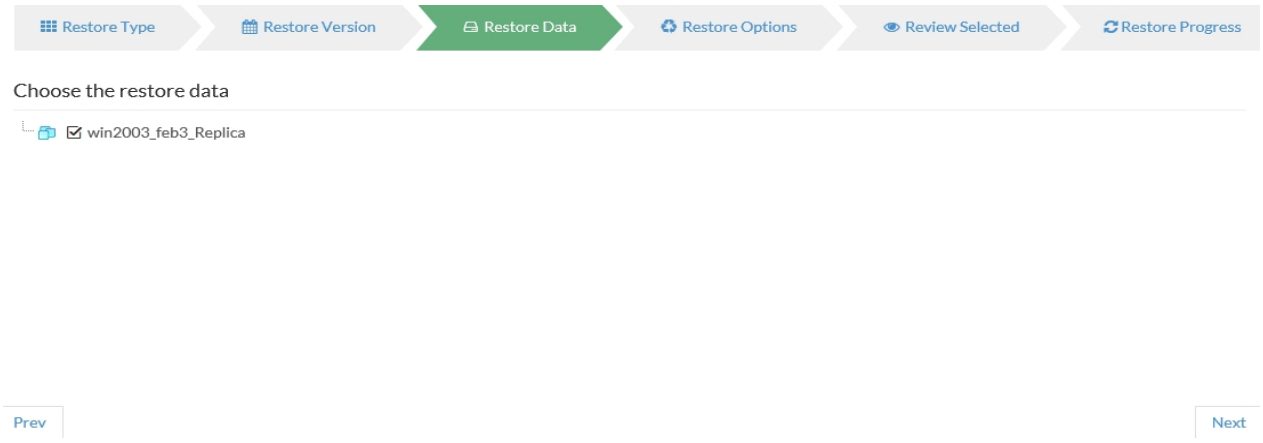
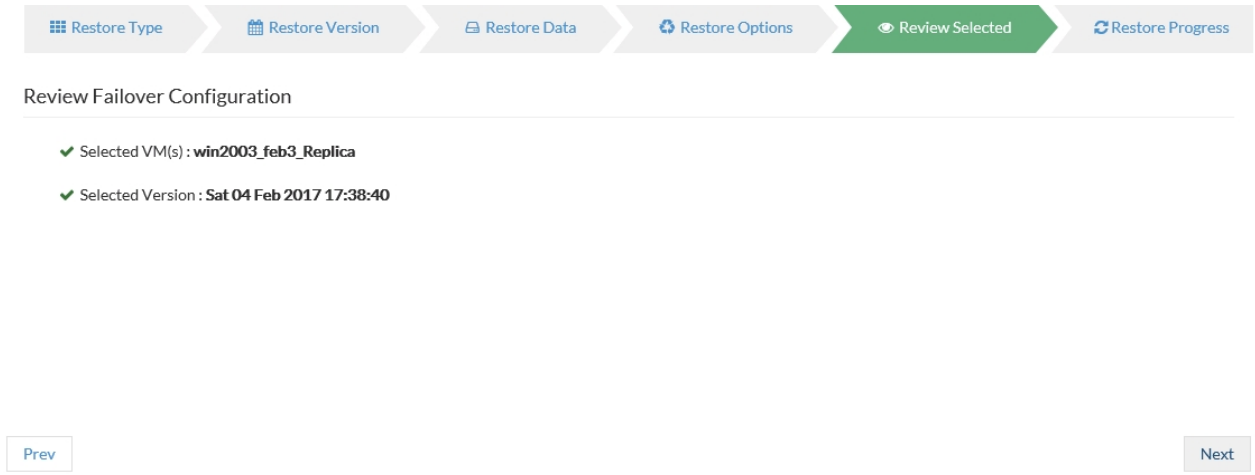


Review:

- Review the provided options and click on 'Failover Now'.



- Once failover completes successfully, the replicated VM in target machine will be active and running.

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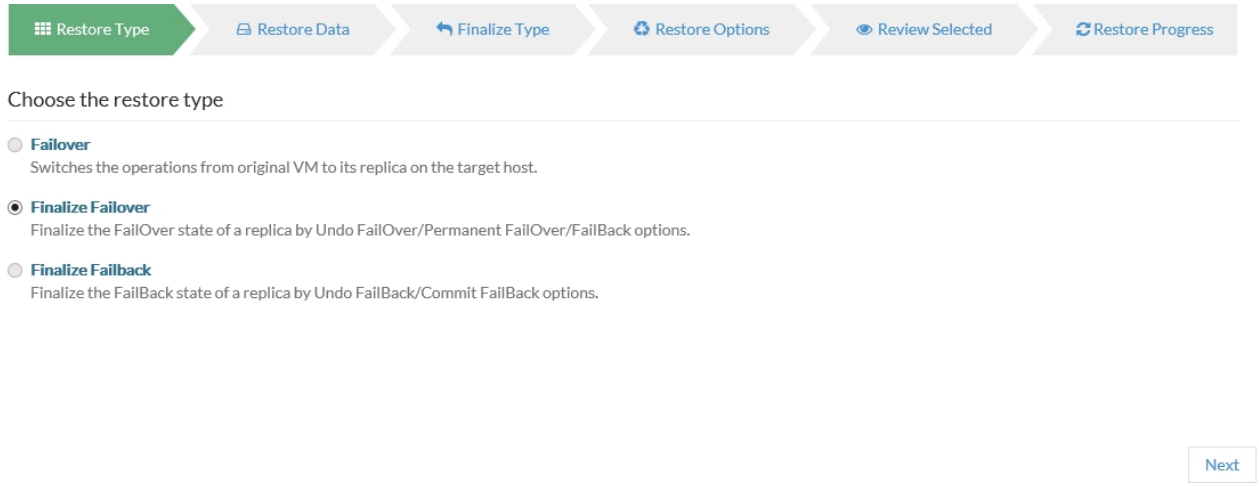
Finalize Failover:

Once done with the requirement of virtual machine that is failovered, users can decide on finalizing failover operation by choosing between following operations:

- Undo Failover
- Permanent failover or
- Failback

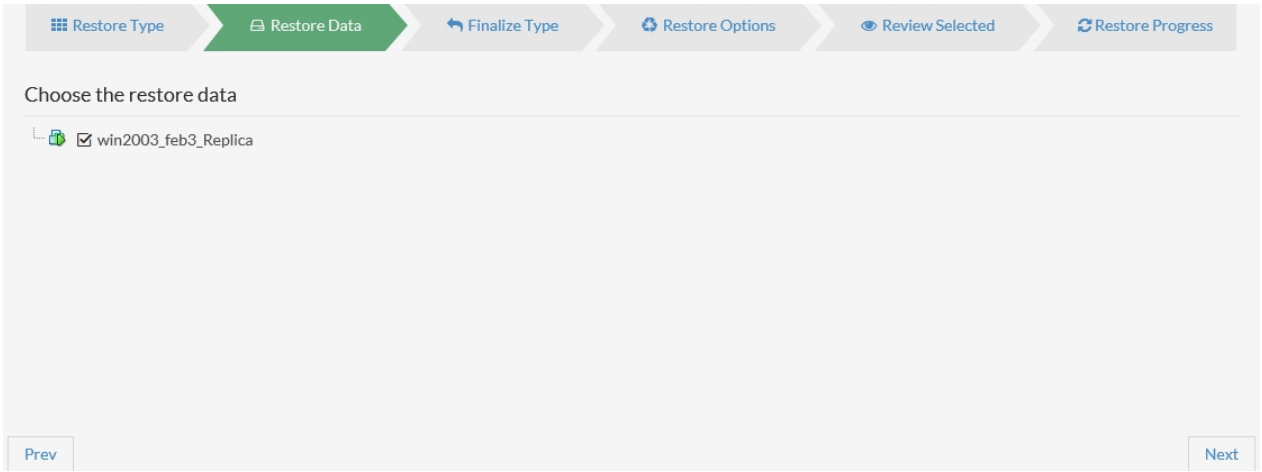
Follow below steps to finalize failover of virtual machines:

- Proceed with restore type: Finalize Failover.



Restore Data:

- Select the VMs to be restored and proceed.



Finalize Type:

Users will have 3 finalize types to choose from:

- **Undo Failover-** This option deletes the changes done in replicated VM during failover

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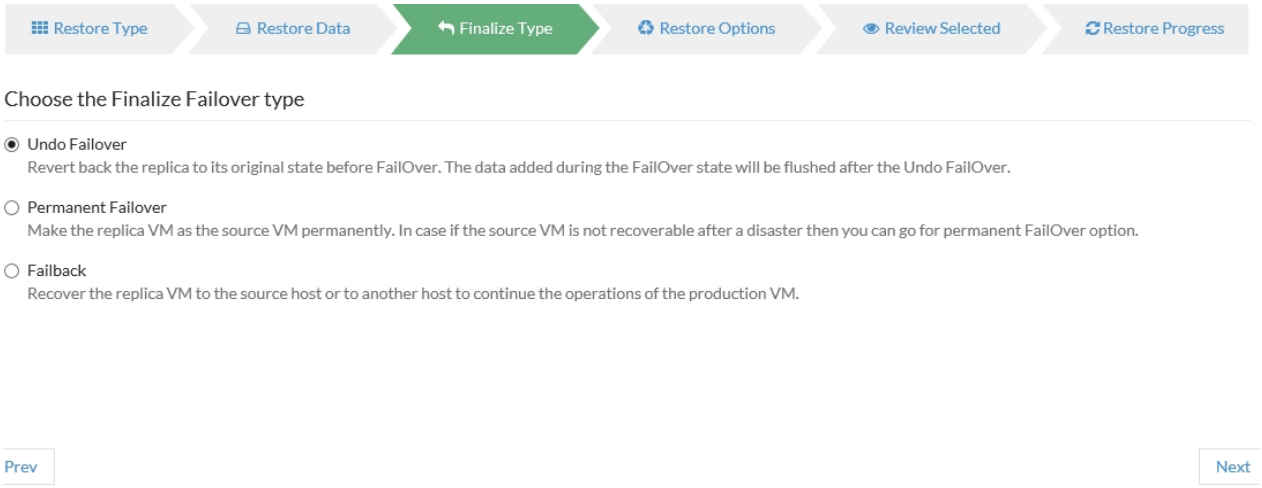
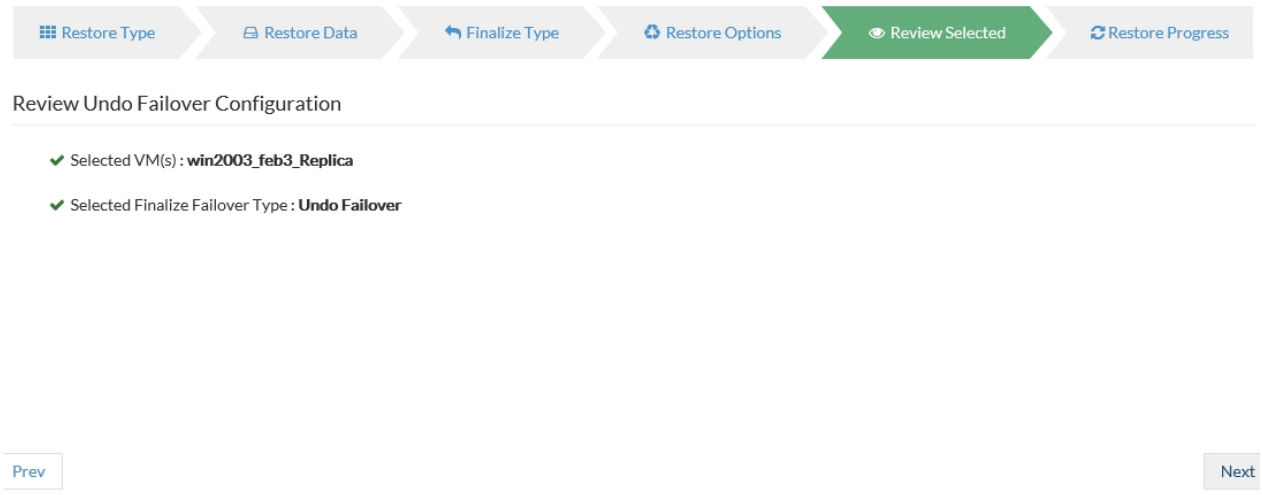
session and reverts back to its original state before failover.
Note: Usually this option is preferred, when the source virtual machine is restored and activated successfully.



- Review the selected VM's and click on 'Next' to proceed.



- Once the "Undo Failover" progress is completed the machine is reverted back to its original state before failover.

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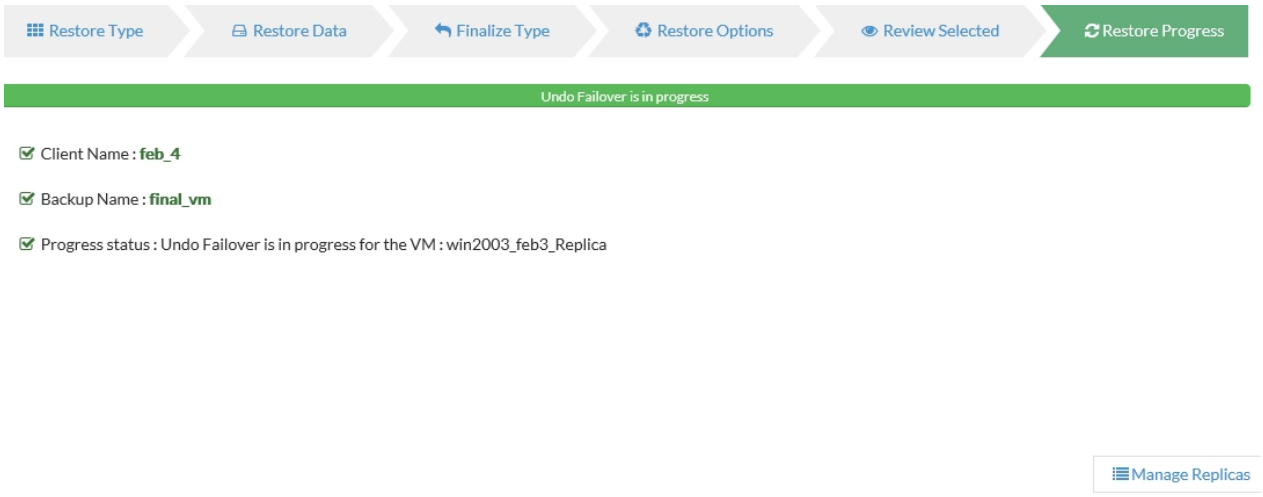
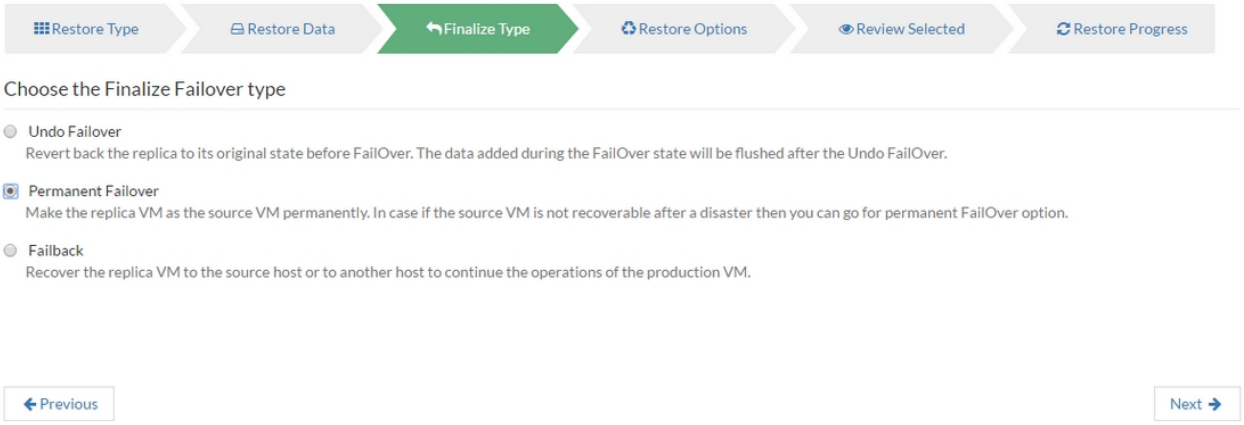


- **Permanent Failover-** This option makes the replicated VM as the source VM permanently.
  Note: This option is usually preferred when the actual source VM is no longer recoverable after a disaster.



Review configurations:

- Review the configuration provided for selected restore option and click Finalize Now.
- **Failback-** Go to Next Page

Evaluator's Guide for VMware Backup

Failback

- **Failback**- This option let users recover the replicated VM along with failover data to the source host or another host to resume its ongoing operations as a production machine.

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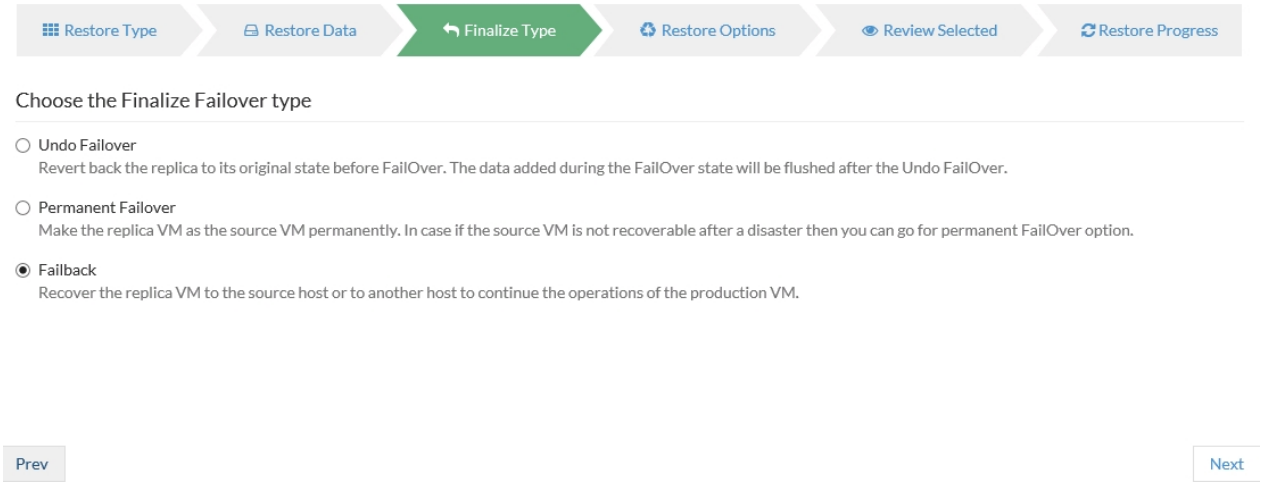
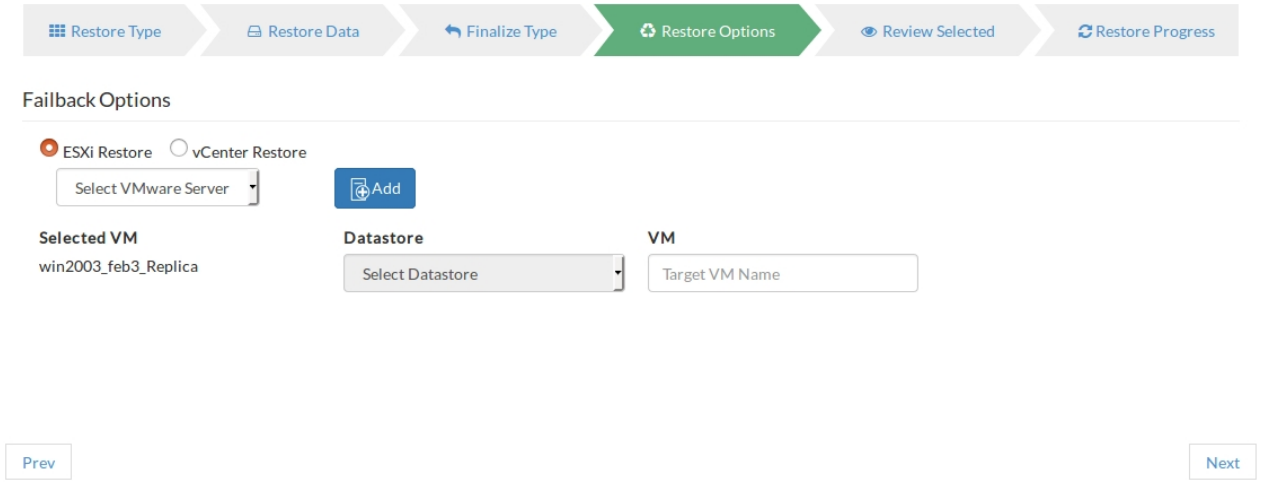


- Failback has an additional step to configure unlike the other two options: undo failover and permanent failover.

Restore Options:

1. Users will be directed to restore options page, where they are required to select target server details such as:
    - Choose between ESXi restore or vCenter Restore and select the VMware server from the added list. If not, do add a target server with 'Add Target Server' option.
    - Now select the respective target host and then the datastore to which the selected VMs are to be recovered.
    - Provide the names for VMs to be restored.
    - Once done, proceed with Next.



Review configurations:

- Review the configuration provided for selected restore option and click Finalize Now.

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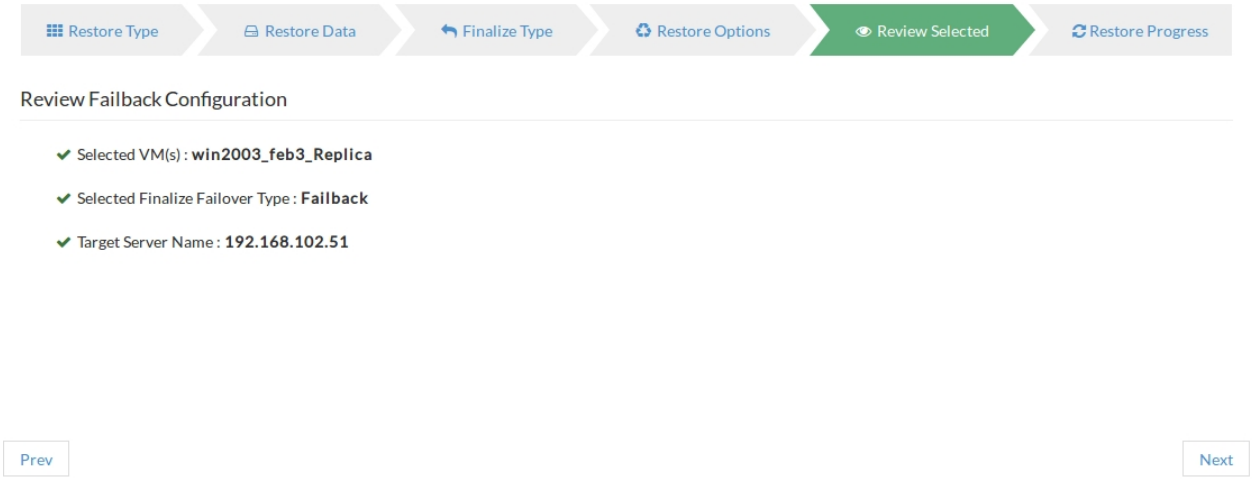
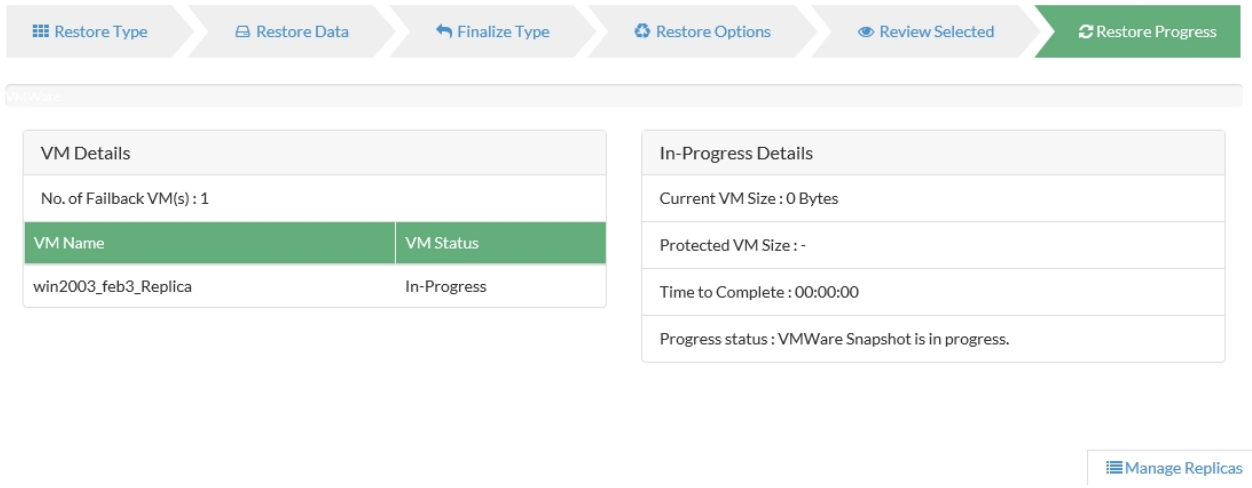


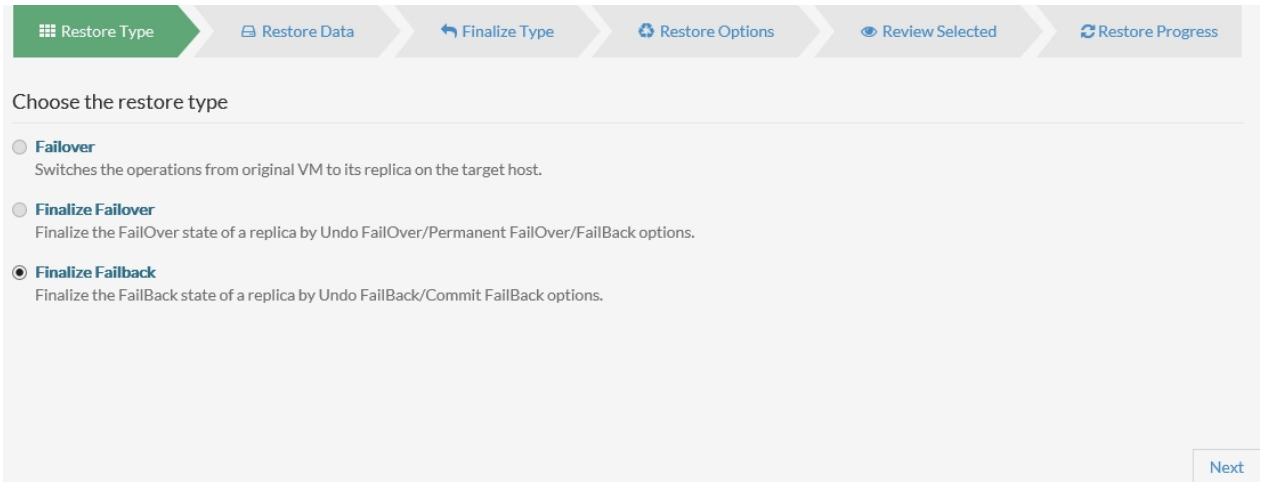
- Once done reviewing click Next to proceed with Failback.



Finalize Failback:

This restore option is enabled, only after when user opts for Failback as Finalize type in Finalize Failover(Restore type).

- Proceed with restore type: Finalize Failback.



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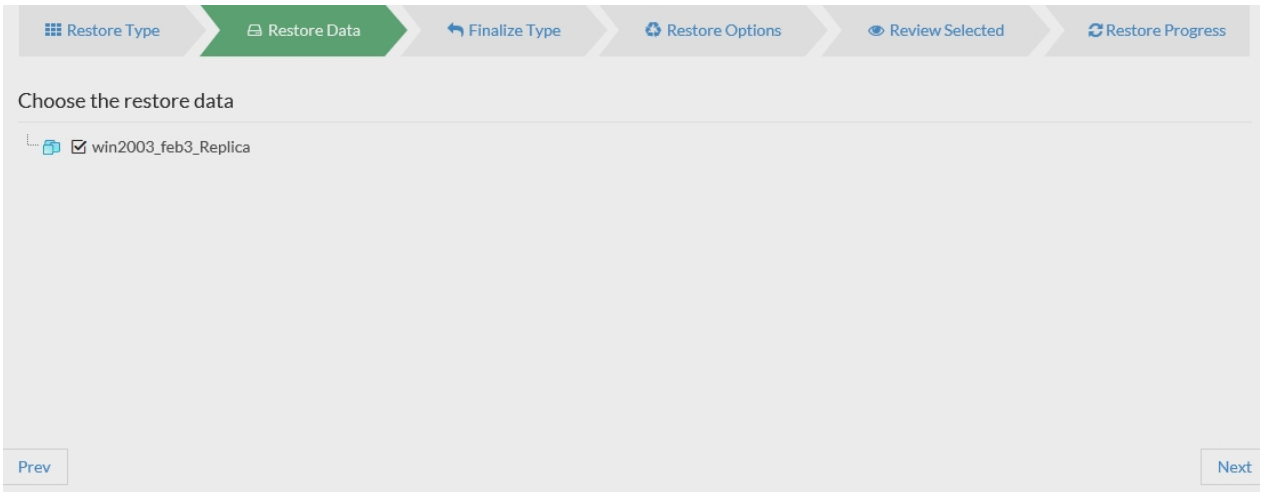
Restore Data:

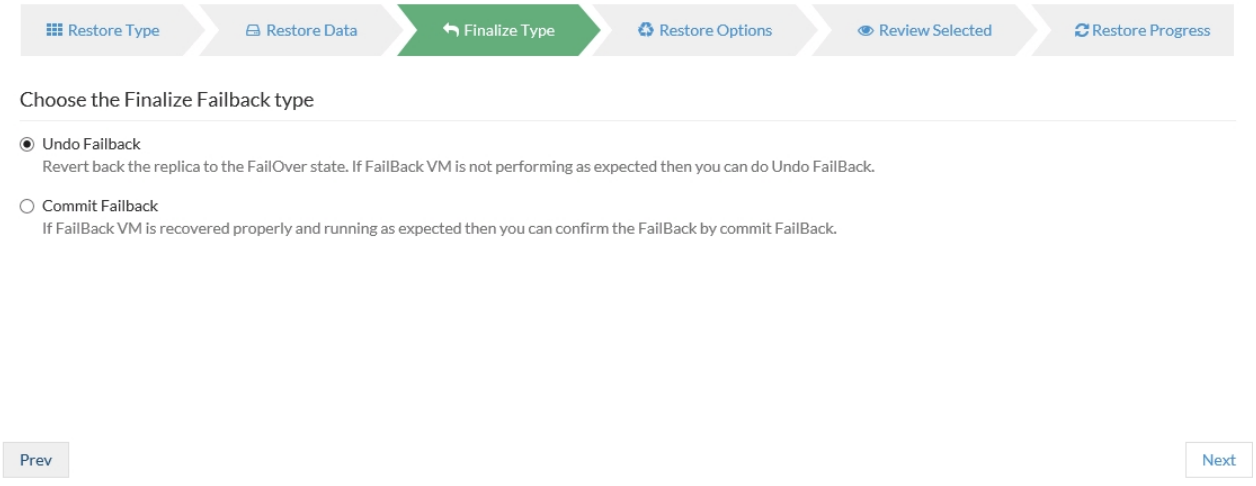
- Select the VMs to be restored and proceed.



Finalize Type:

Users will have 2 finalize types to choose between:

- **Undo Failback-** When a VM recovered via Failback option does not function properly or if the restore fails due to any reason, then this option is chosen to revert back the replica to resume the Failover state.



Review configurations:

- Review the configuration provided for selected restore option and click Finalize Now.

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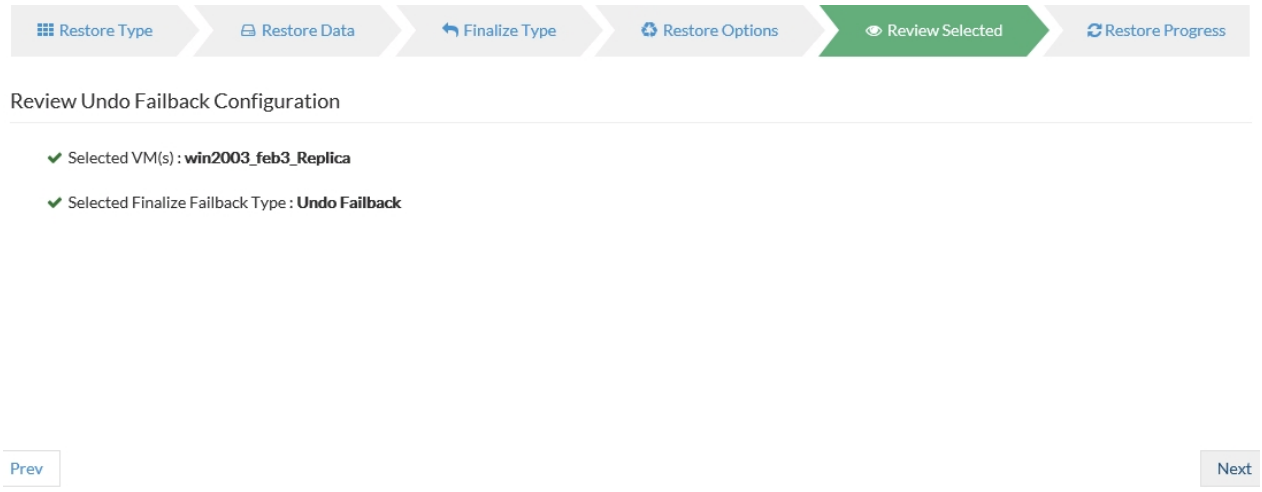
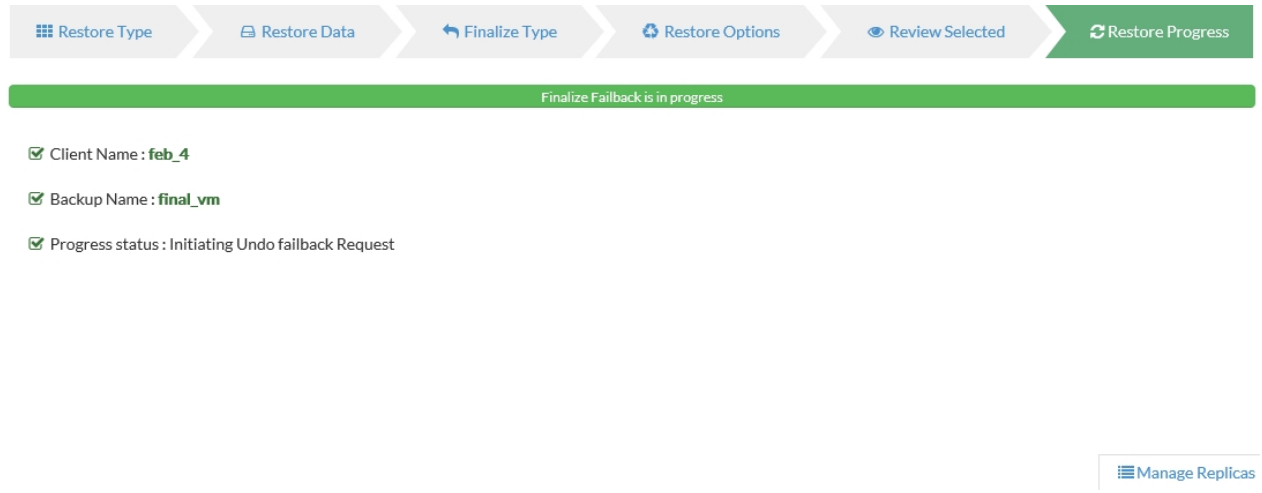
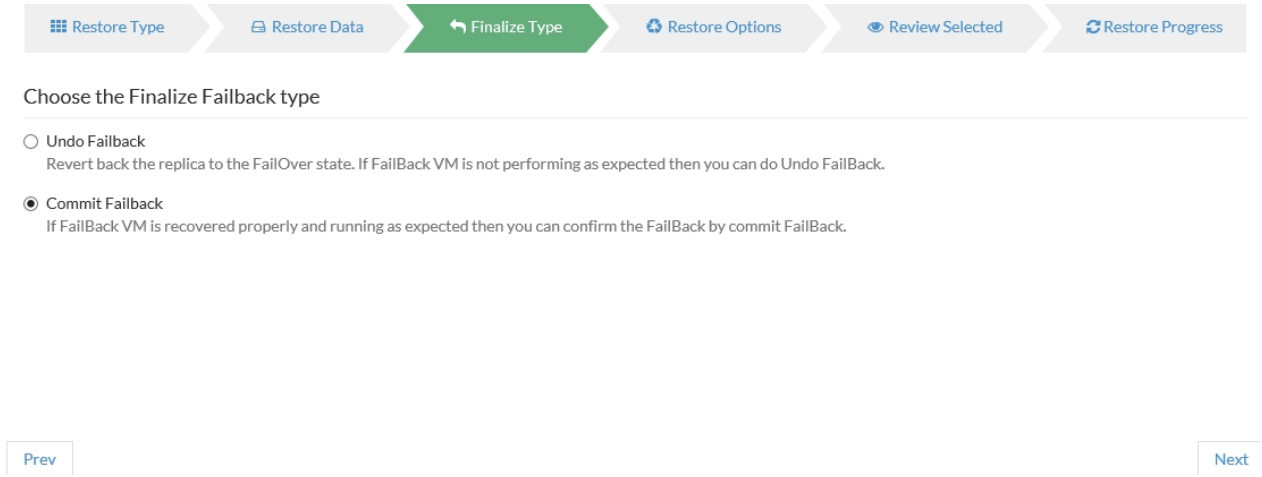


- Once done reviewing click Next to proceed with Undo Failback.



- **Commit Failback-** When a VM recovered via Failback performs as expected, then this option is chosen to confirm commiting Failback. This means that the failbacked VM will now be selected as production VM and will get excluded from replication jobs.



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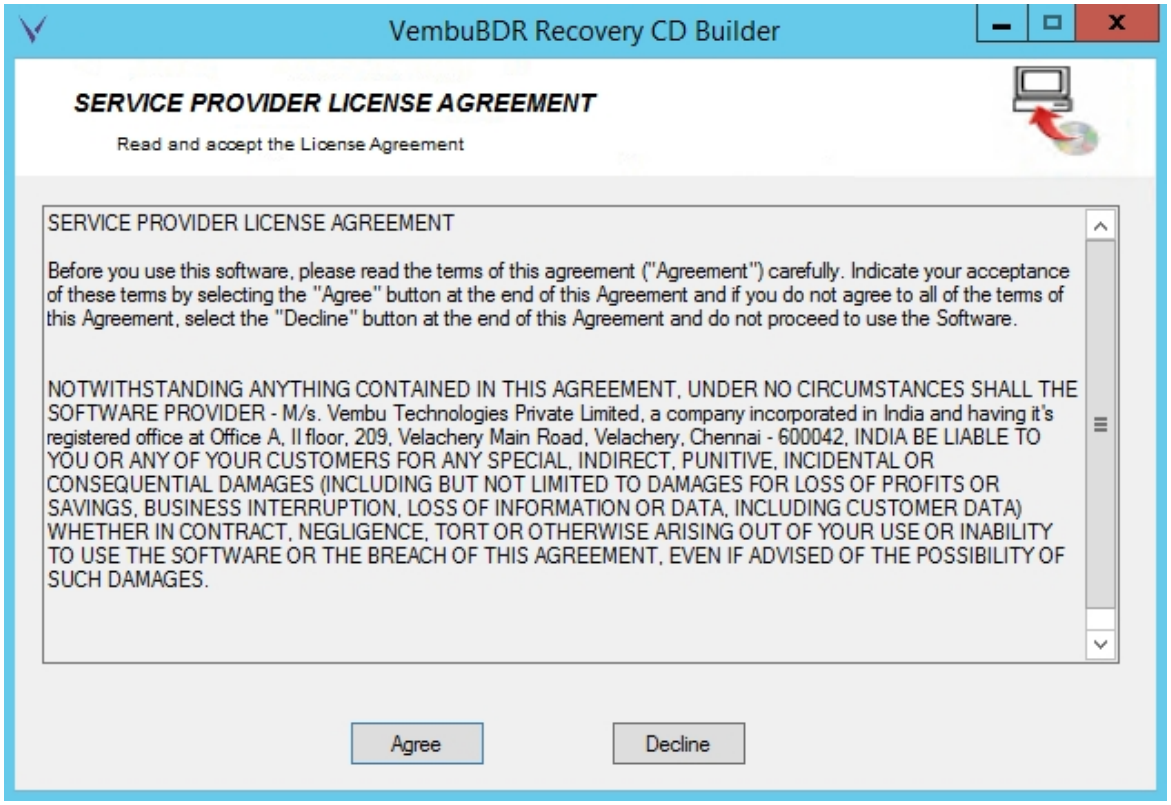
Evaluator's Guide for VMware Backup

Bare-metal Recovery

Follow below steps to perform Physical Recovery for Image backups using Recovery CD:

- To do bare-metal recovery using Vembu Recovery CD first we need to download and install WAIK. Click on below link, to download WAIK: http://www.microsoft.com/enus/download/confirmation.aspx?id=5753

- Once WAIK is installed, download Vembu Recovery CD: Click Here to Download
- You will have Vembu Recovery CD in both 32-bit and 64-bit zip formats, download accordingly based on requirement. Now unzip the downloaded file and run RecoverCDBuilder with administrator privileges. You will get a window opened as shown below.



- Read the service provider license agreement carefully and click agree. You will be proceeded to VembuBDR Recovery CD builder window as shown below.
  Note: When you have RAID and additional drivers to be setup in the machine to be recovered, such drivers can be bundled with Vembu Recovery CD using 'Additional Driver' option.

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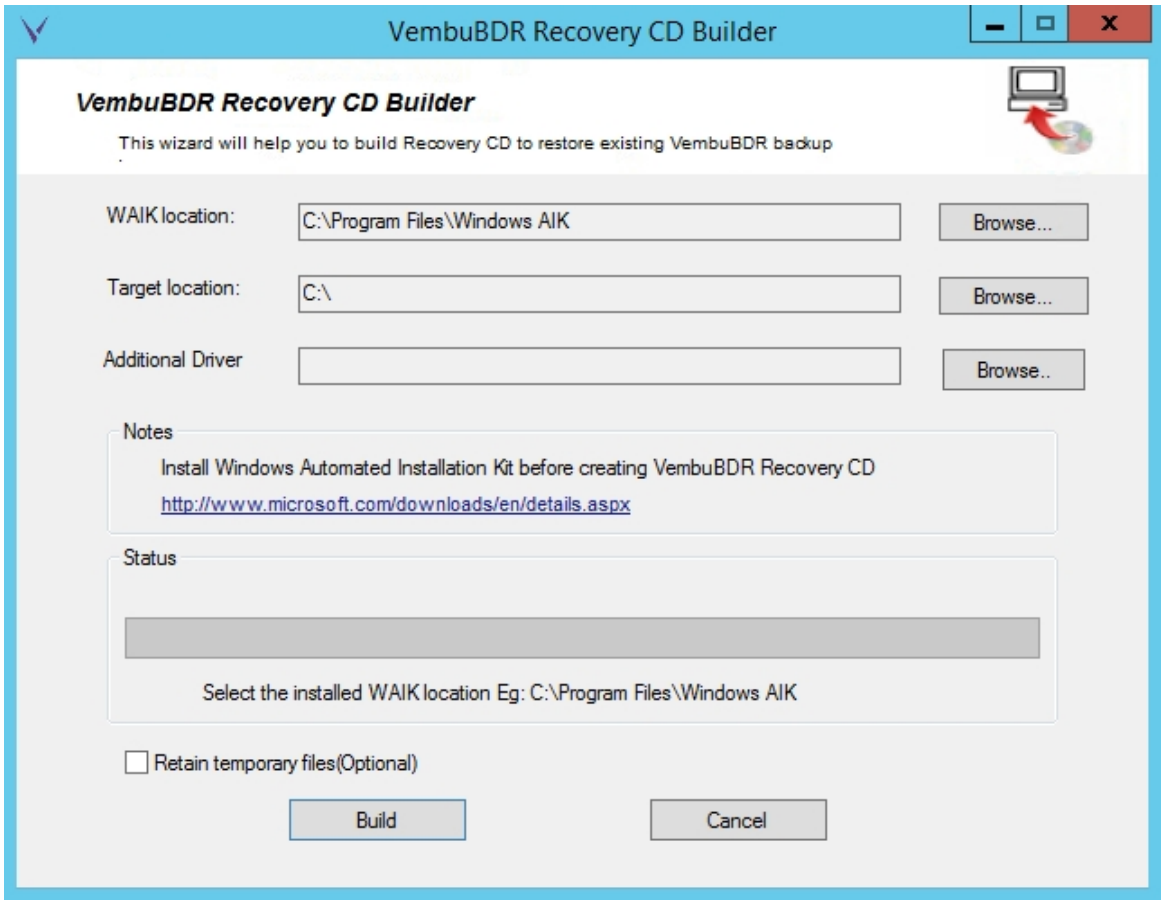

- In this window, WAIK location will be auto-filled, target location is the location where you want to store ISO. Now click Build to start creating ISO file. You can also monitor the progress of ISO creation.

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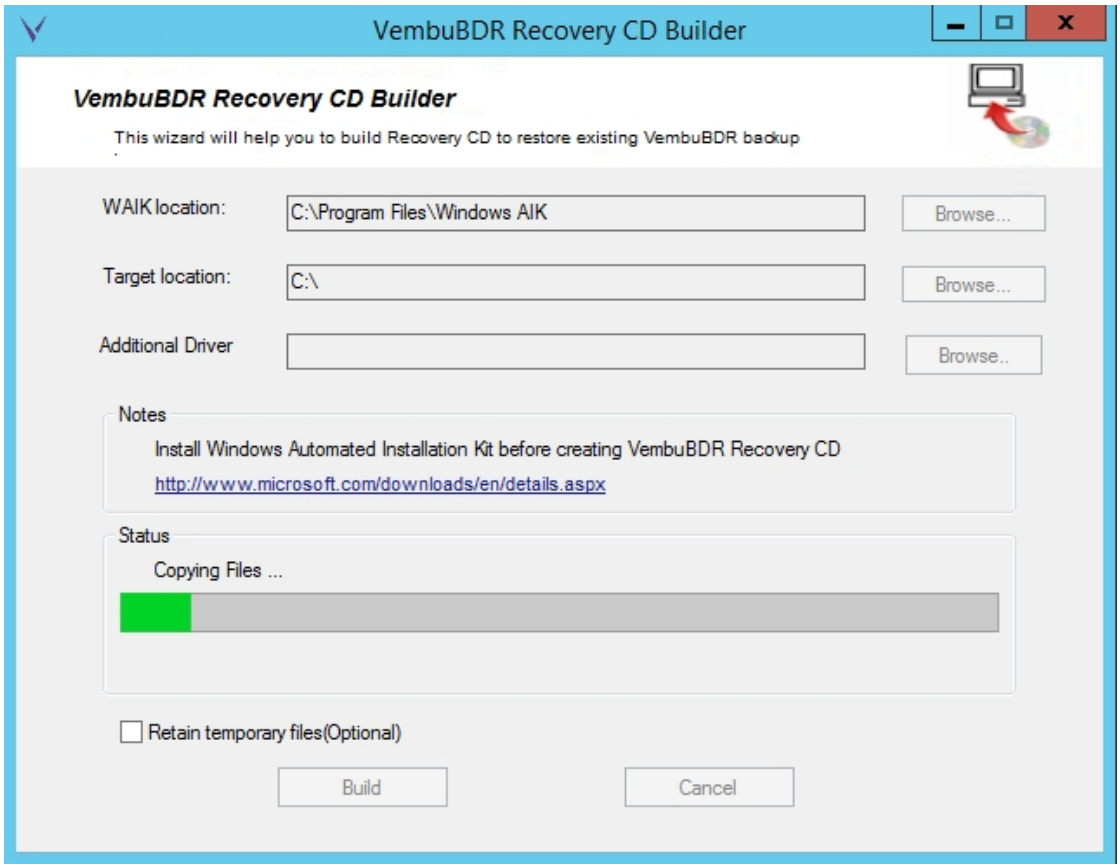
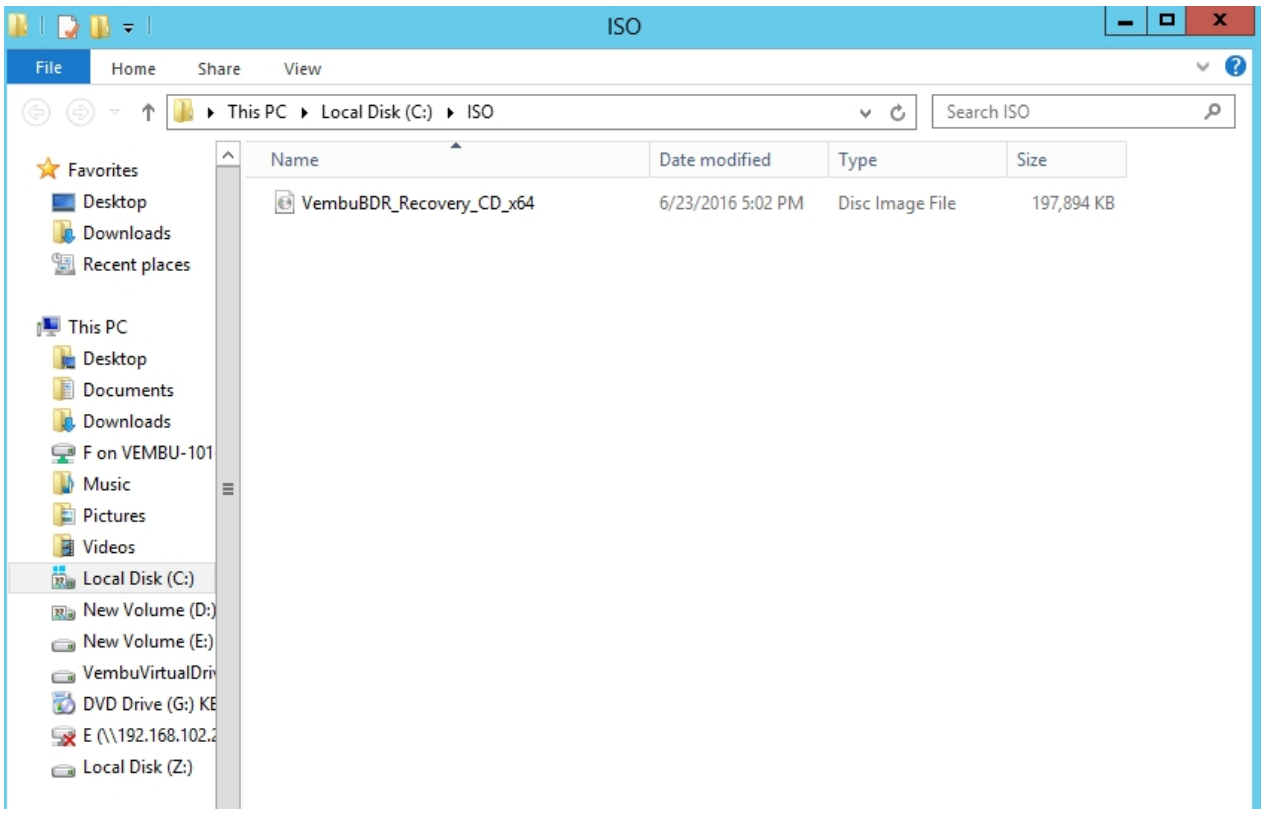


- Once done, the ISO file will be available in the Target location you have entered.



- Insert a blank CD in CD/DVD drive and burn the created ISO file in CD by right-clicking over ISO file and choosing the option 'Burn Disk Image'. Windows Disk Image Burner

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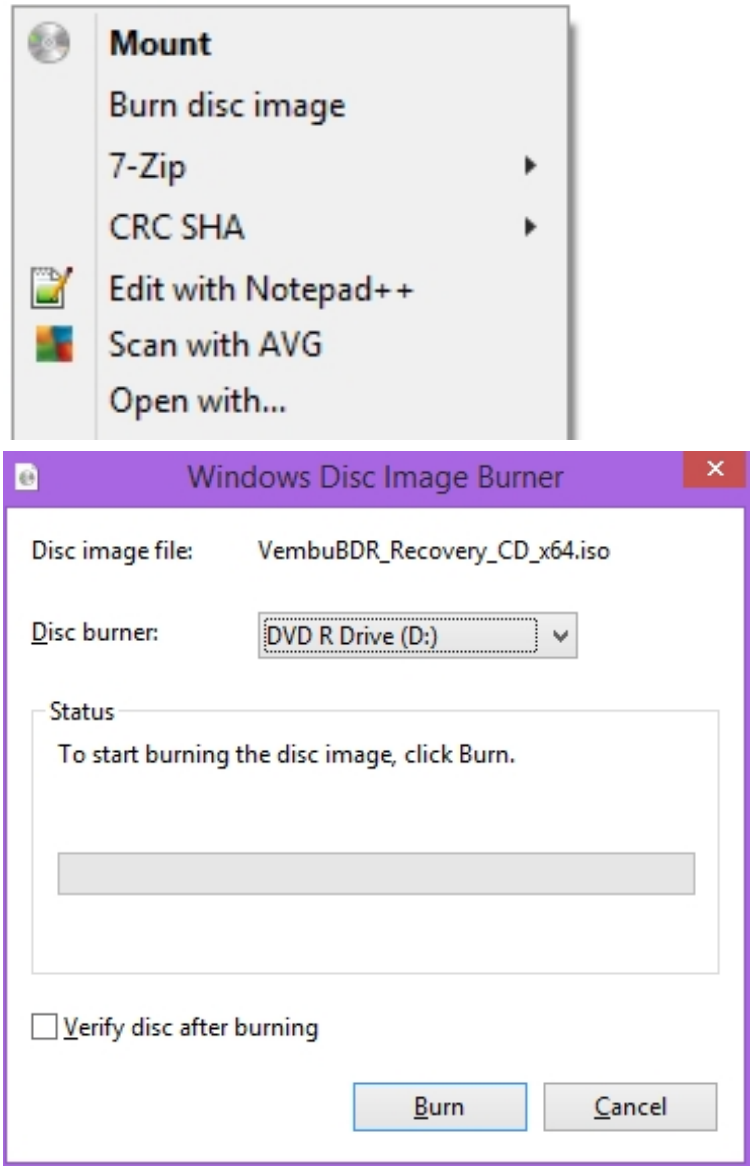
will open, choose the CD/DVD drive and click burn to start burning process.



- You can also monitor the progress of burning process.
- Once the burn process completes, CD will be auto ejected. Reinsert CD and reboot machine to BIOS settings. Change the boot priority and set CD/DVD as primary boot device and click Save and Exit. VembuBDR recovery console will be opened as shown below. Click Next to continue.

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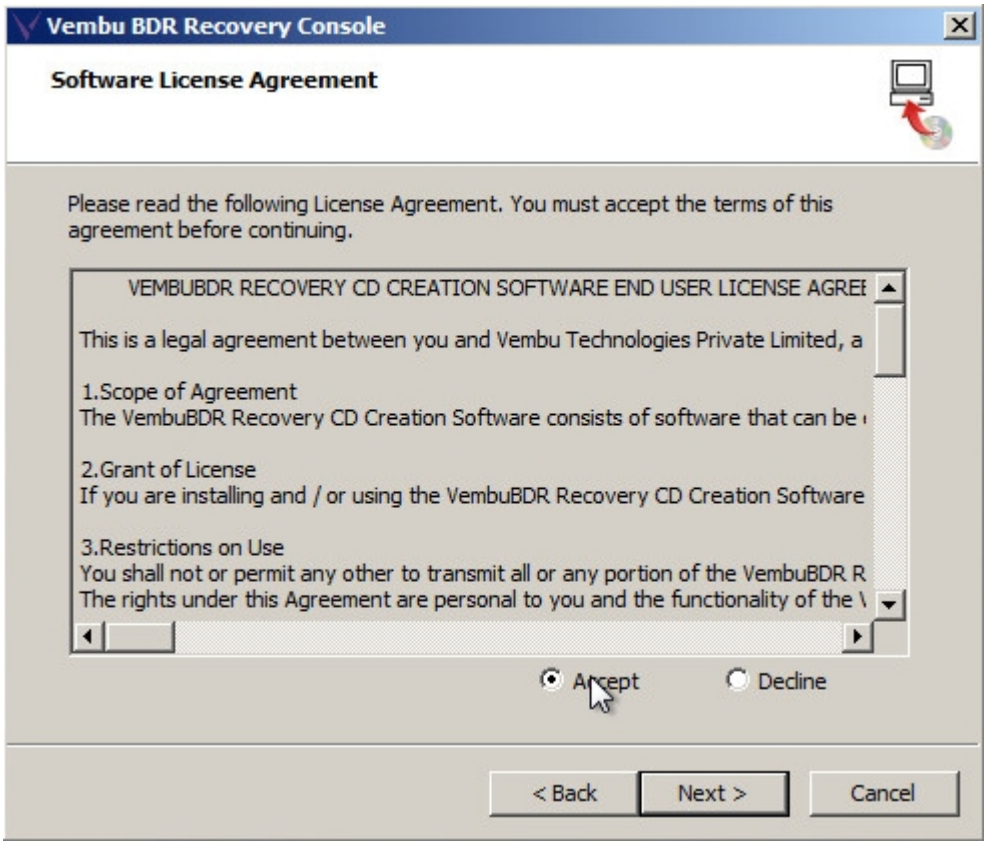
- Read the Software License Agreement carefully, click Accept and proceed with Next.



- You will have option to select a task from the below list:
    - Recover entire disk or partition

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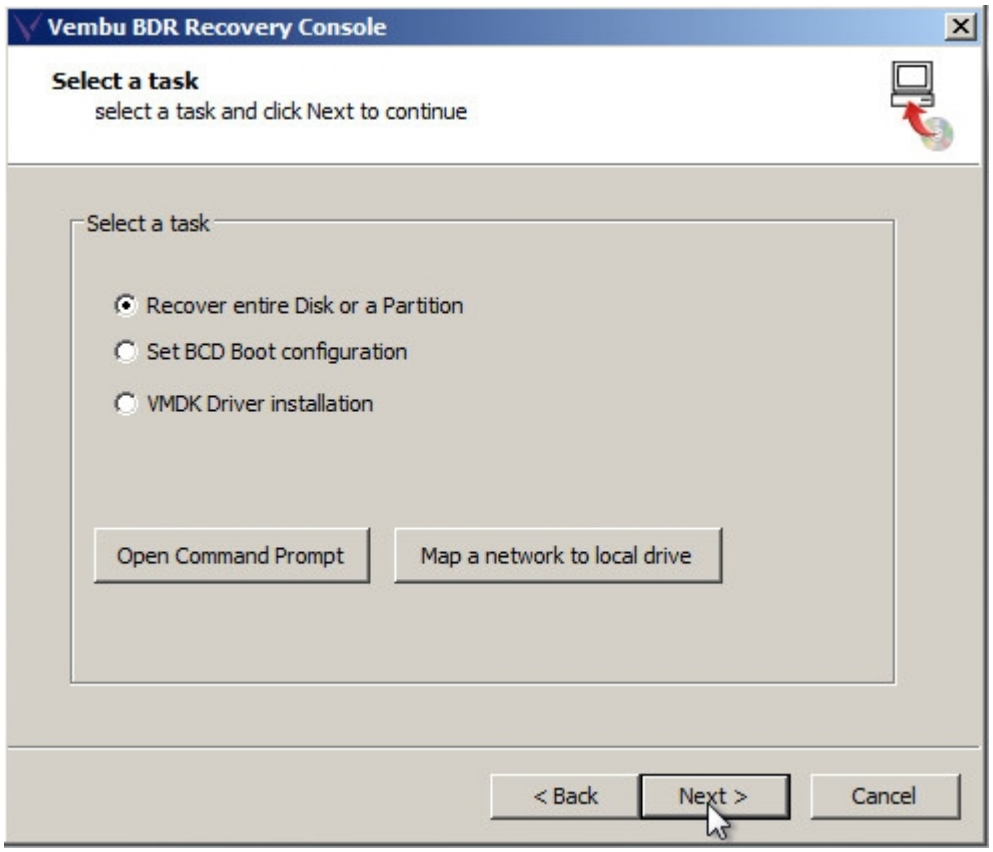
- Set BCD boot configuration
- VMware driver installation

Since we have to do physical recovery, we'll proceed with 'Recover entire disk or partition' option and click Next.



- You will be directed to recovery page, where you will be required to provide details for following options:
  - Browse and select the file which you need to recover.
  - Browse and select the backup configuration file.
  - Select the disk/drive you wish to restore from the following list.

  Once done choosing respective requirements, click Next to proceed.

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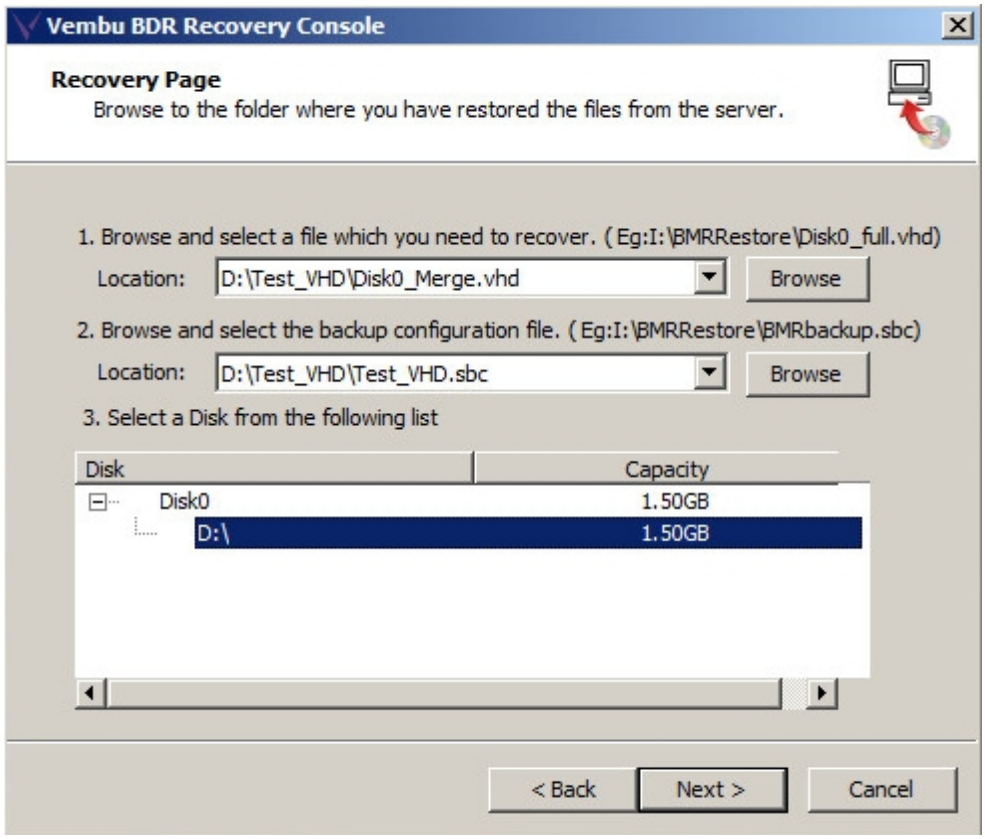
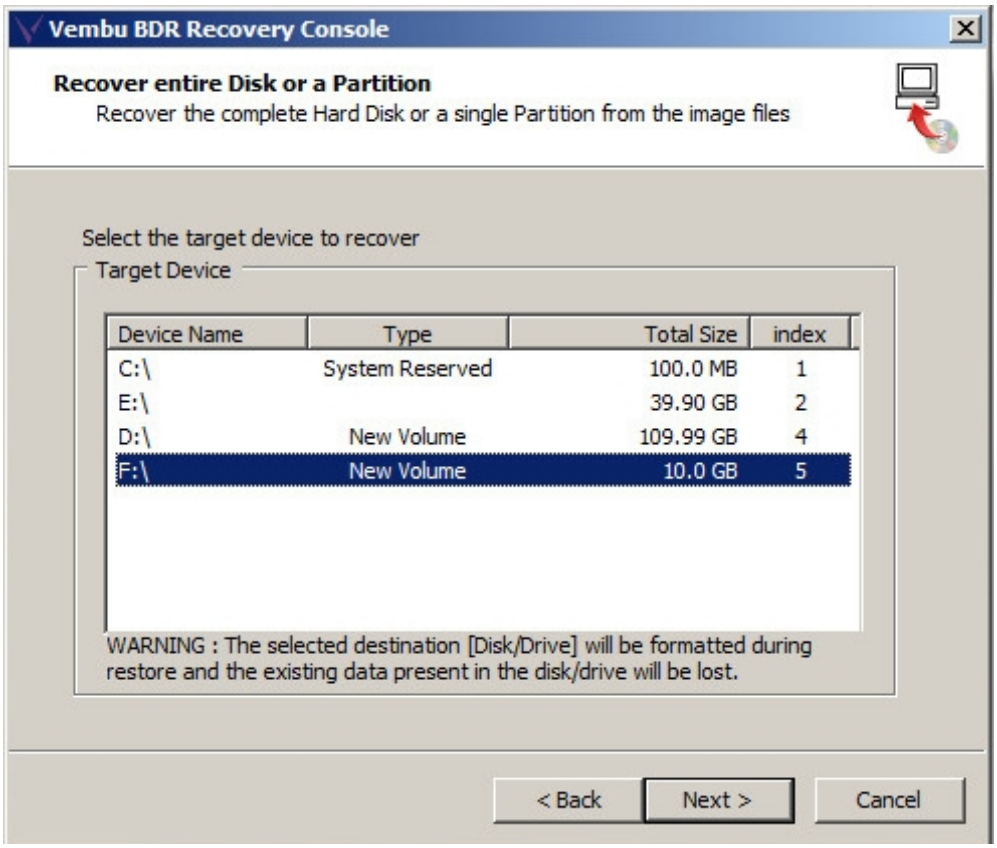


- In next window, you will be required to select target disk/drive to which recovery will be performed. Once done selecting the target, click Next.
  Note: the selected disk/drive will be formatted and only recovered data will be available. So make sure you don't have any important data on target disk/drive.



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- Proceeding will initiate the recovery process and once it's done. You can find your recovered data in target disk/drive selected.

Evaluator's Guide for VMware Backup

Vembu Virtual Drive

Vembu Virtual Drive is an exclusive feature of VembuBDR server, that allows user to instant access backup data. With the help of VembuHIVE file system, Vembu Virtual Drive virtual mount backup data and allow instant access for users.

Vembu Virtual Drive will make following file format types available for any image based backups mounted in it:

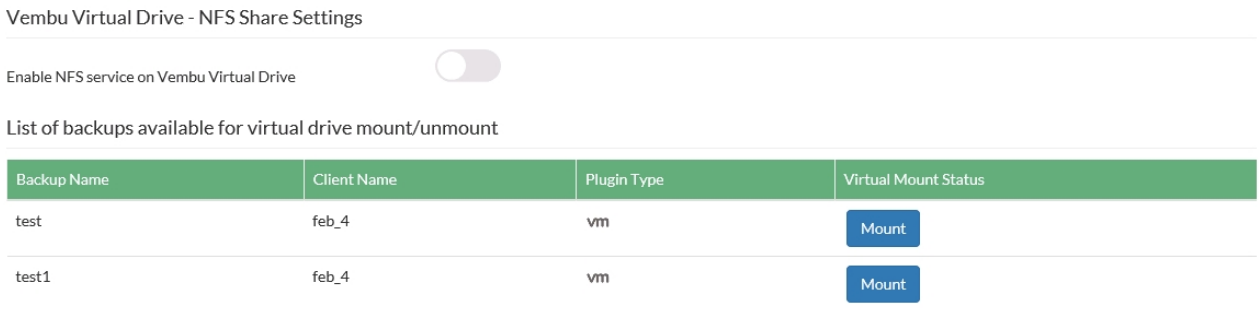
- VHD
- VMDK
- VHDX
- VMDK-Flat
- RAW image files

These files can be used based on user requirements. For example, a VHD file can be mounted in Hyper-V or a VMDK file can be mounted in a ESXi server or a RAW image file can be mounted in KVM to create a virtual machine. VHD file can also be mounted in disk management to access file level backup data.

Manage Vembu Virtual Drive (NFS Share)

- Go to Management → Server Management → Manage Virtual Drive

This page lists all image backups stored in backup server and user can virtual mount any backup data he wish to instant access.



- To virtual mount a backup data, user have to click 'Mount' option alongside specific backup job to be accessed and click Yes in confirmation dialog.

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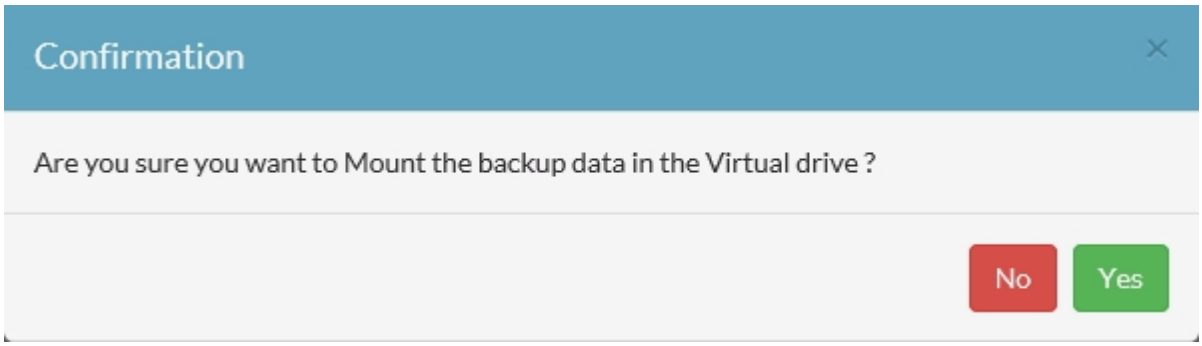
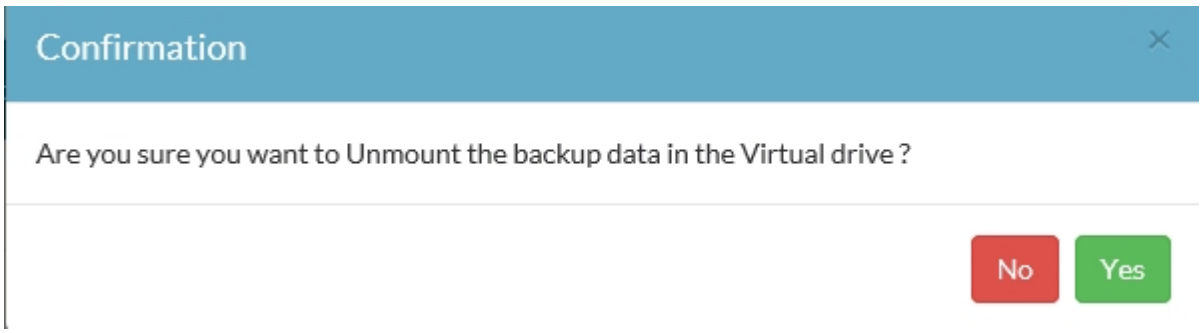


- User can now have access to backup data by viewing VembuVirtualDrive displayed in My Computer.
- Once done with requirement, user can unmount data by clicking on Unmount option and confirming with a Yes in confirmation dialog.

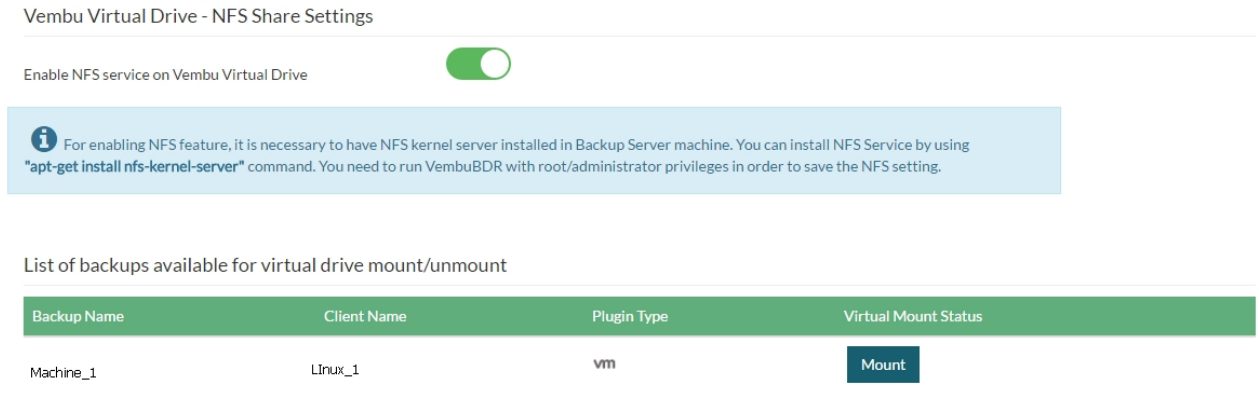


Enable NFS Service on Vembu Virtual Drive

- Vembu Virtual Drive can be shared within a network area by enabling NFS service on Vembu Virtual Drive.
- NFS service for Vembu Virtual Drive is available on both Linux and Windows servers.

Note: For enabling NFS feature in Linux servers, it is necessary to have NFS kernel server installed in Backup Server machine. You can install NFS Service by using "apt-get install nfs-kernel-server" command. You need to run VembuBDR with root/ administrator privileges in order to save NFS settings.

Enable NFS Service on Linux Screenshot:



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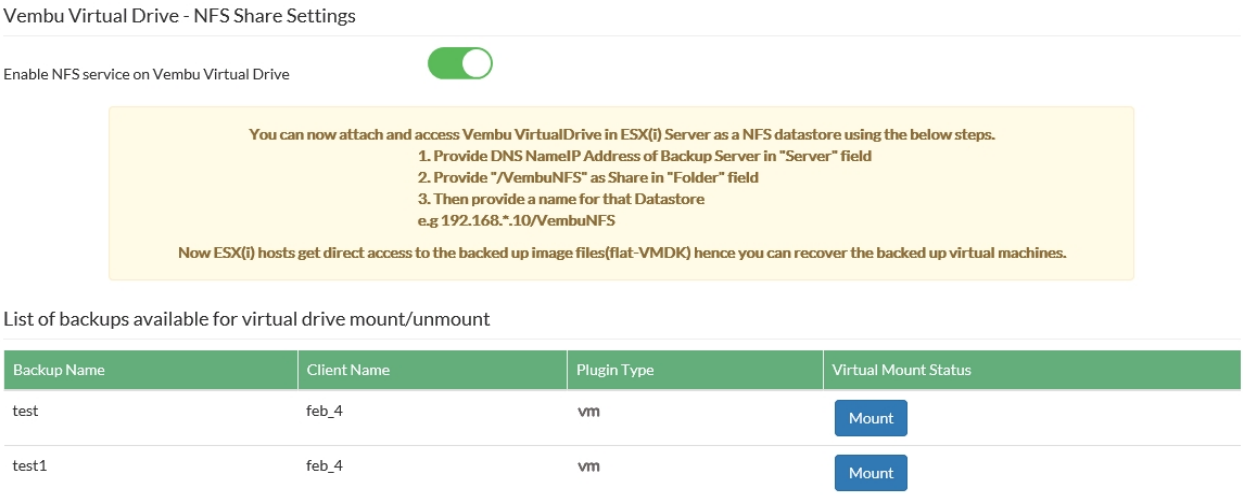
Enable NFS Service on Windows Screenshot:



- NFS share service allows user to add VembuVirtualDrive as a NFS datastore in ESXi servers.

Note: Before enabling NFS service on Vembu Virtual Drive, please make sure Microsoft or any other third party NFS services is disabled to ensure uninterrupted service.

Evaluator's Guide for VMware Backup

Reports

- Backup Job Report
- Backup Status Report
- Image Verification Report
- Email Alert Configuration

Evaluator's Guide for VMware Backup

Backup Job Report

- Go to Recovery.
- This page lists all the backup jobs configured to server where you can see a report option alongside every backup job.
- Click on Reports.

- In this page, users can view historical reports of the specific backup chosen where following reports will be listed:
    - Backup report
    - Restore report
    - Merge report
    - Deleted backup report
    - Offsite Copy report

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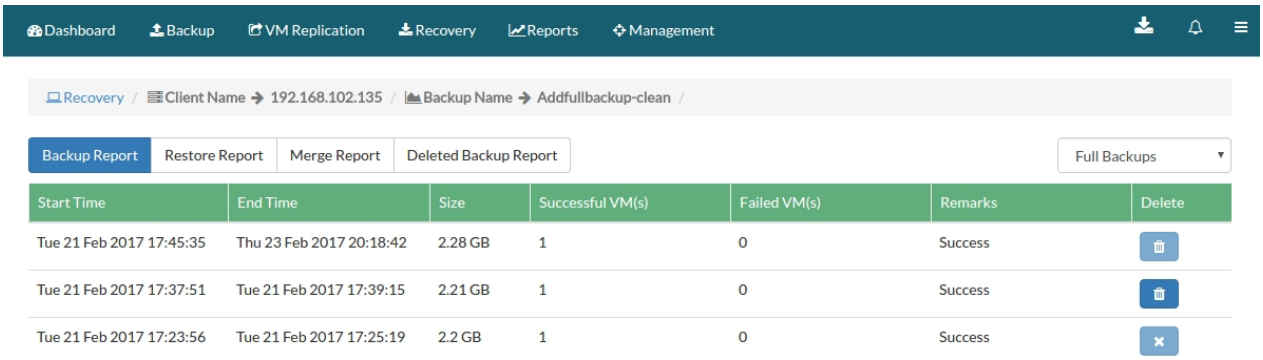
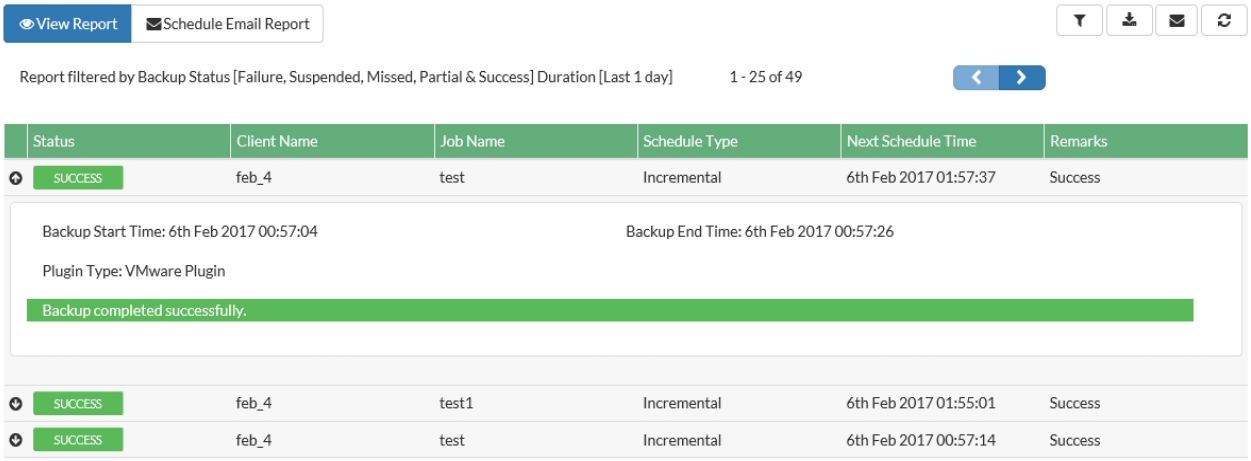


- Users can also filter the reports to view status of full backups alone(excluding incrementals).

Evaluator's Guide for VMware Backup

Backup Status Report

- Go to 'Reports → Backup Status Report'
- A page where user can view, filter and download overall backup status report will be displayed. Backup status includes: Failure, Suspended, Missed, Partial & Success.



Filter report:

- Filter option let users add custom filters where they can apply filter of their choice for ease of view.
- Backup filter includes following statuses to choose from: Missed, suspended, failed, successfully completed, partially completed and all.
- Filters can also be applied based on duration where users can provide their custom data range, apart from ranging between last 1-30 days.

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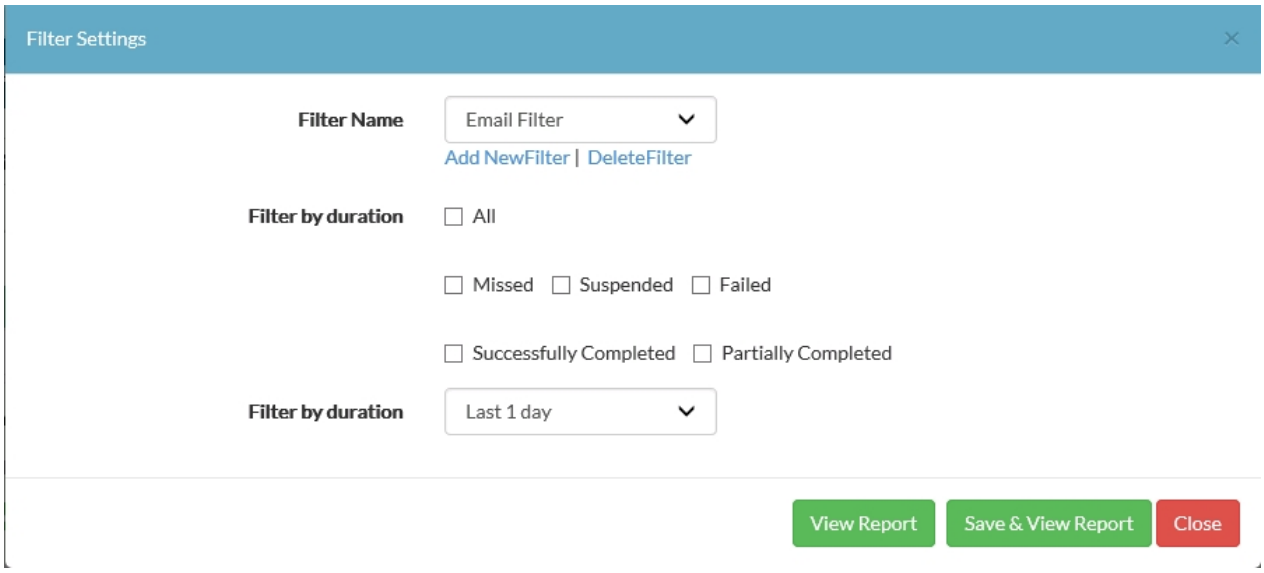
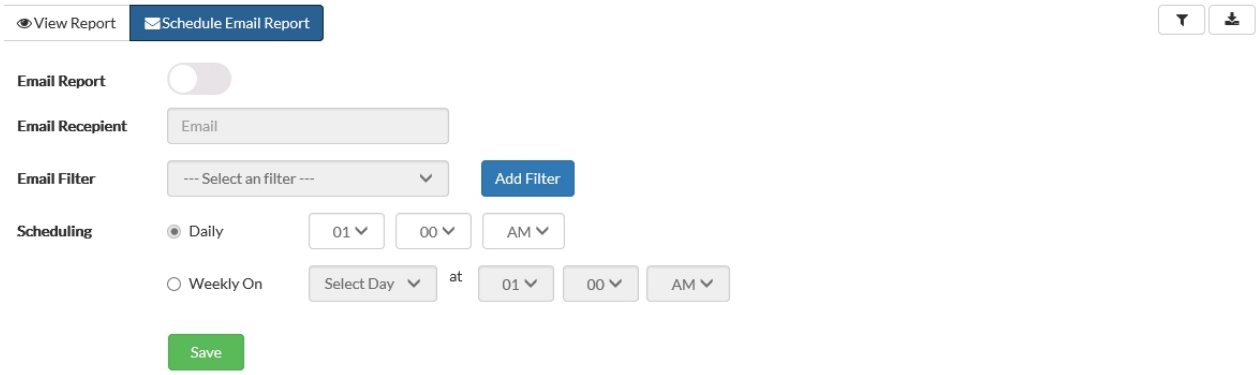


Schedule Email report:

- Users can also send custom filtered reports by providing a sender Email address.
- And can choose a custom filter saved or add a new filter based on requirement.
- And choose schedules when to send:
    - Daily by specifying a time period.
    - Or choose weekly and specify a weekday and time period.



Note: Users can also download reports as csv files.

Evaluator's Guide for VMware Backup

Image Verification Report

- Go to 'Reports → Image Verification Report'
- This page lists every image backups configured to Vembu BDR server along with the backup details such as: backup name, plugin, client name, host name, machine name, disk name and scheduled time(Most recent backup time).
- It also confirms if the backup data is mountable and provides boot image of most recent backup(This ensures that the backup is in readily-bootable state).

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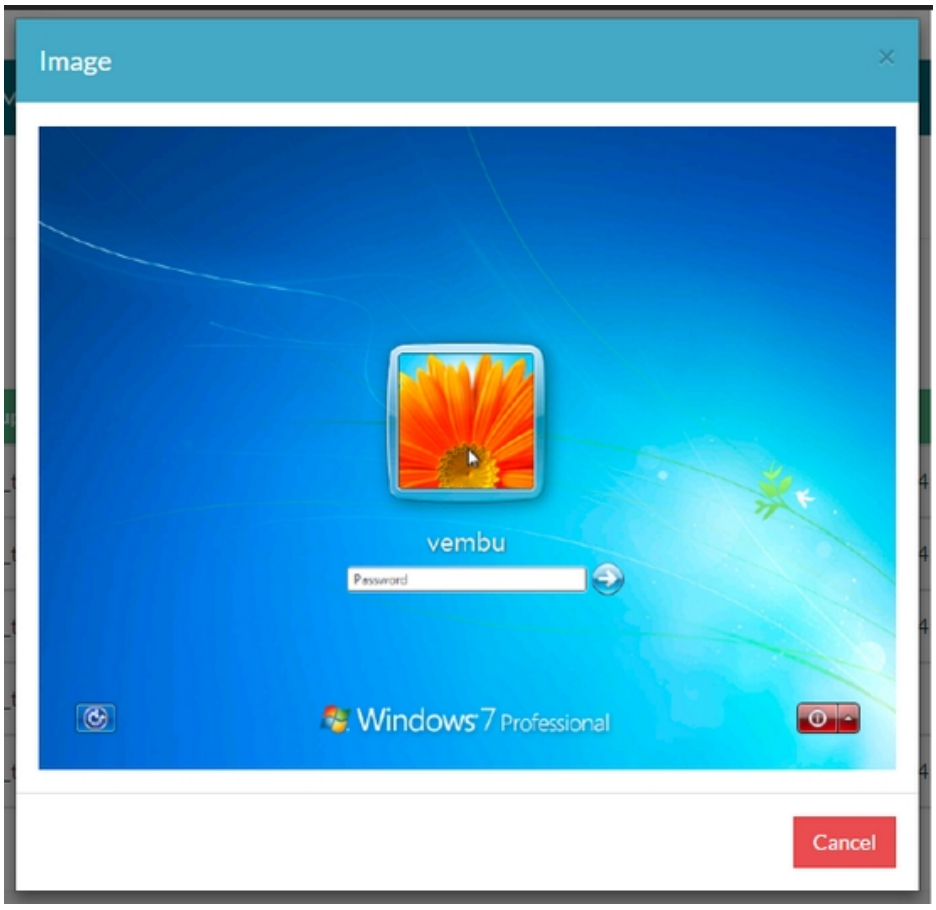
Image Verification Report

Report filtered by [Client: All, Backup: All, Integrity Status: Success & Failure] Reset

Listing 1 to 2 of 2 reports

Plugin	Client Name	Backup Name	Host Name	Machine Name	Disk Name	Scheduled Time	Mount	Boot
vm	feb_4	test1	192.168.102.18	XP_64bit	XP_64bit...	Sun 05 Feb 2017	✔	NA
vm	feb_4	test	192.168.102.18	XP_64bit	XP_64bit...	Sun 05 Feb 2017	✔	NA

- An example of boot image is given below:



Evaluator's Guide for VMware Backup

Email Alert Configuration

This option let users set SMTP server and configure email address to which backup reports can be mailed periodically. Options to configure sending various reports to different email addresses is also available.

- Go to 'Management → Settings → Email Settings → Email Configuration'
  By default, Email Configuration will be disabled. Enable it.

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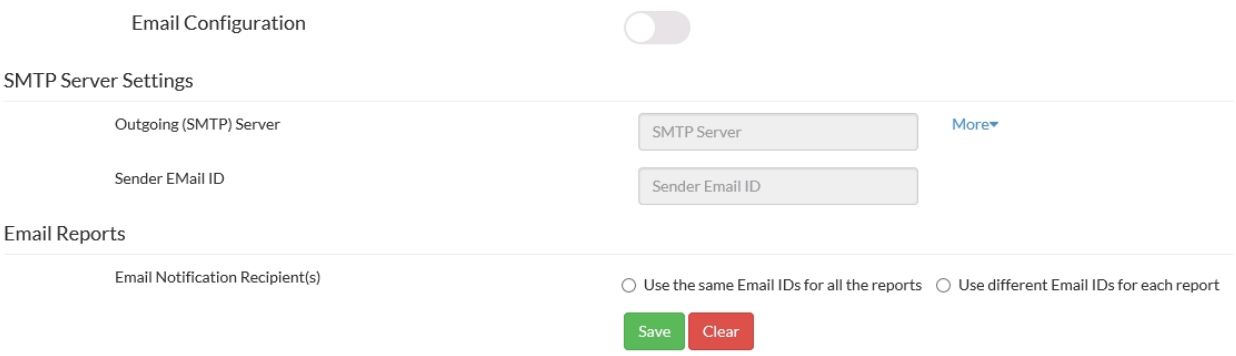
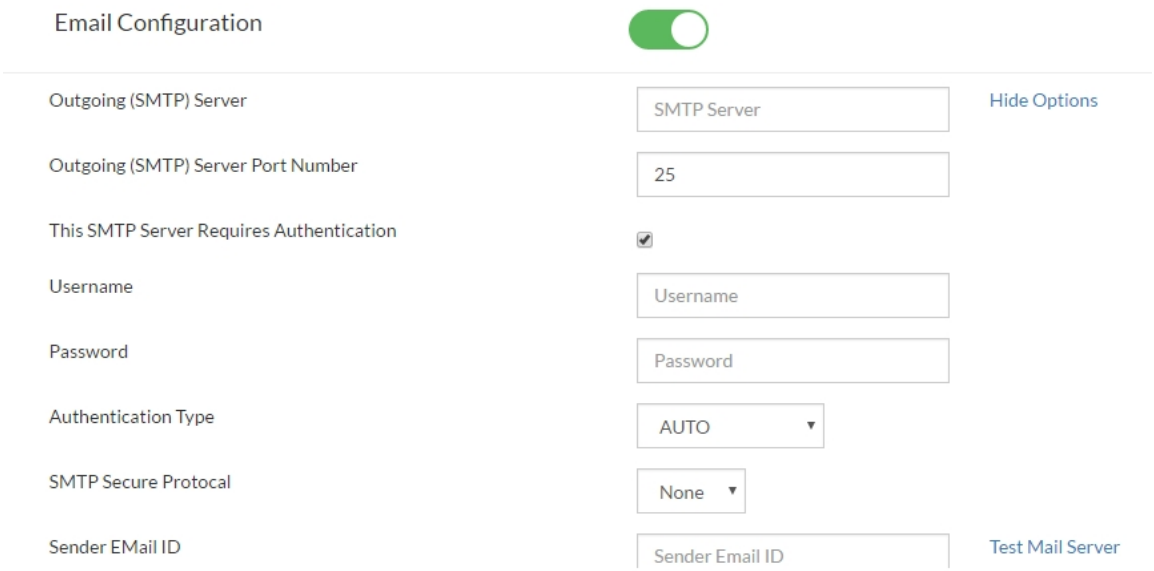


Configure SMTP server:

- Provide SMTP server details and if required provide outgoing server port number.
- Also do provide authentication credentials, if SMTP server requires one.
- You also do have options to choose authentication type and SMTP secure protocol.



- Once done providing SMTP server details, user can test by sending a test mail and verify it is working successfully.

Email reports:

- Users can configure:
    - A single Email ID to receive all success/failure reports from server.
    - Or enable different Email IDs for each success/failure report generated (Server backup/restore/delete reports).

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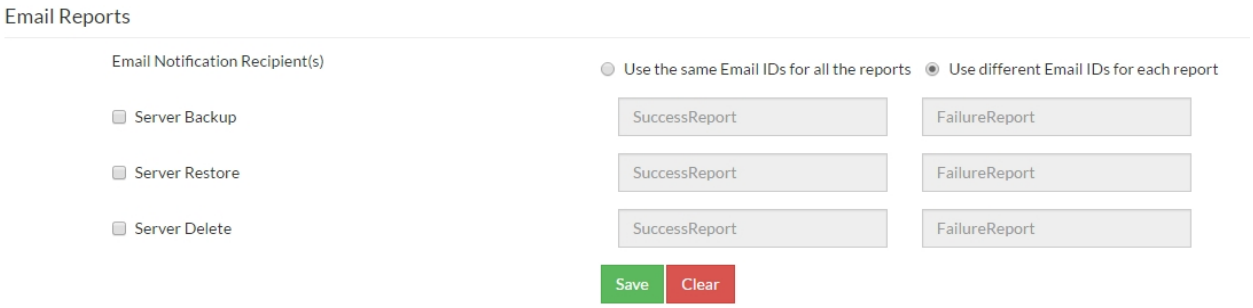


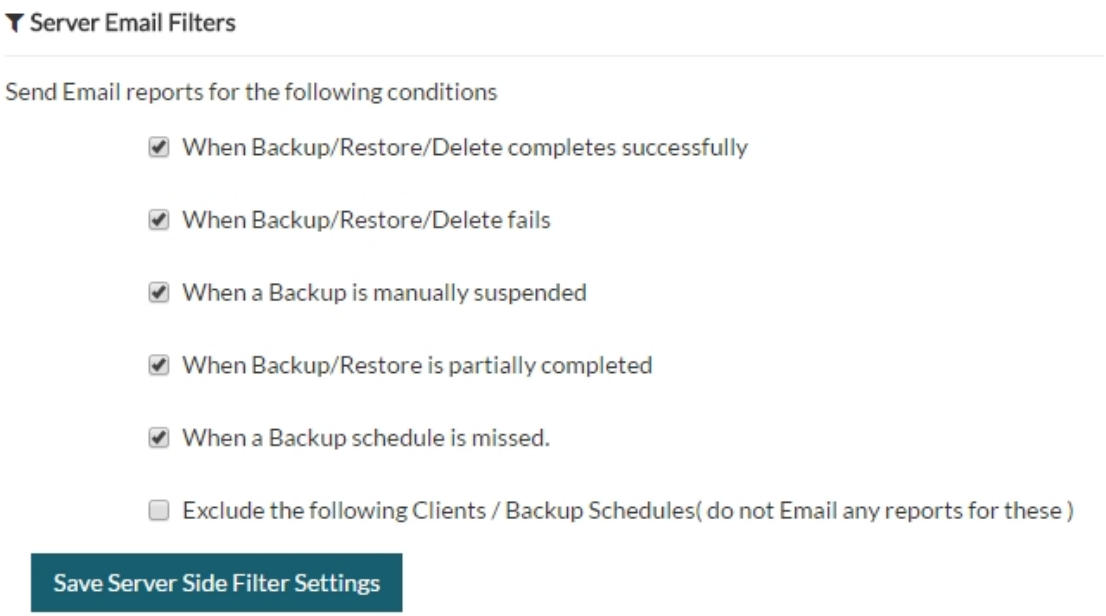
- Click save to save email settings provided.

Email Settings - Email Filters:

- Go to ' 'Management → Settings → Email settings → Email Filters'
- Users have following filter conditions available, which can be enabled and disabled based on requirement.

- **Filter conditions:**
  - When Backup/Restore/Delete/Replication completes successfully.
  - When Backup/Restore/Delete/Replication fails.
  - When there are no new or modified files for replication.
  - When a Backup is manually suspended.
  - When Backup/Restore is partially completed.
  - When a Backup schedule is missed.

- Once done choosing filters, save it.



Note: By default, all filters are enabled.

Exclude Client/Backup from Reports:

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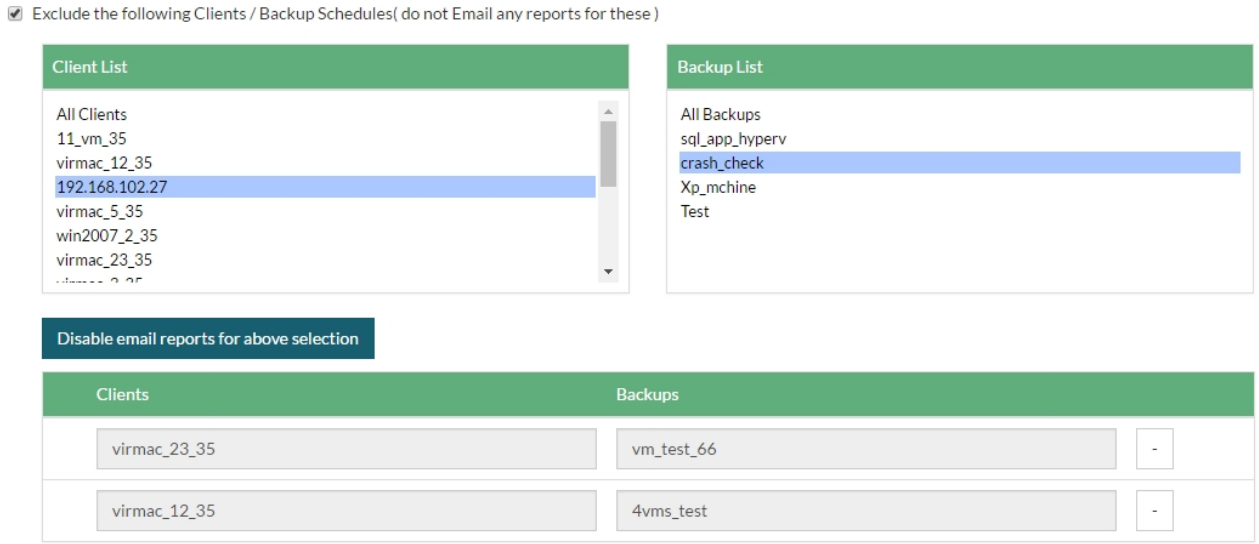
Users also have an option to exclude specific set of Clients / Backup Schedules from receiving Email reports. This can be done by enabling following condition:

- Exclude the following Clients / Backup Schedules (do not Email any reports for these)

- Once enabled, the list of clients along with the list of backups will be listed. User can either select:
    - All clients to exclusion list.
    - Or choose specific backup from a client and add it to exclusion list.

- A client/backup can be excluded by selecting 'Disable Email reports for above selection'.



Note: Excluded backups can also be reverted.

Evaluator's Guide for VMware Backup

Portal Registration

User should create a Vembu portal account, in order to get backup server registered with Vembu portal, where a user can manage all his/her Vembu products and services.

Creating a Vembu Portal Account:

Vembu portal is an all-in-one hub spot for managing your registered Vembu products and services where you can get started. To register in Vembu portal, follow the steps given below:

- Go to portal.vembu.com and click on Signup.
- You will be required to provide the following details in order to create your account:
    - Company Name
    - First Name and Last Name
    - Email ID
    - Contact Number

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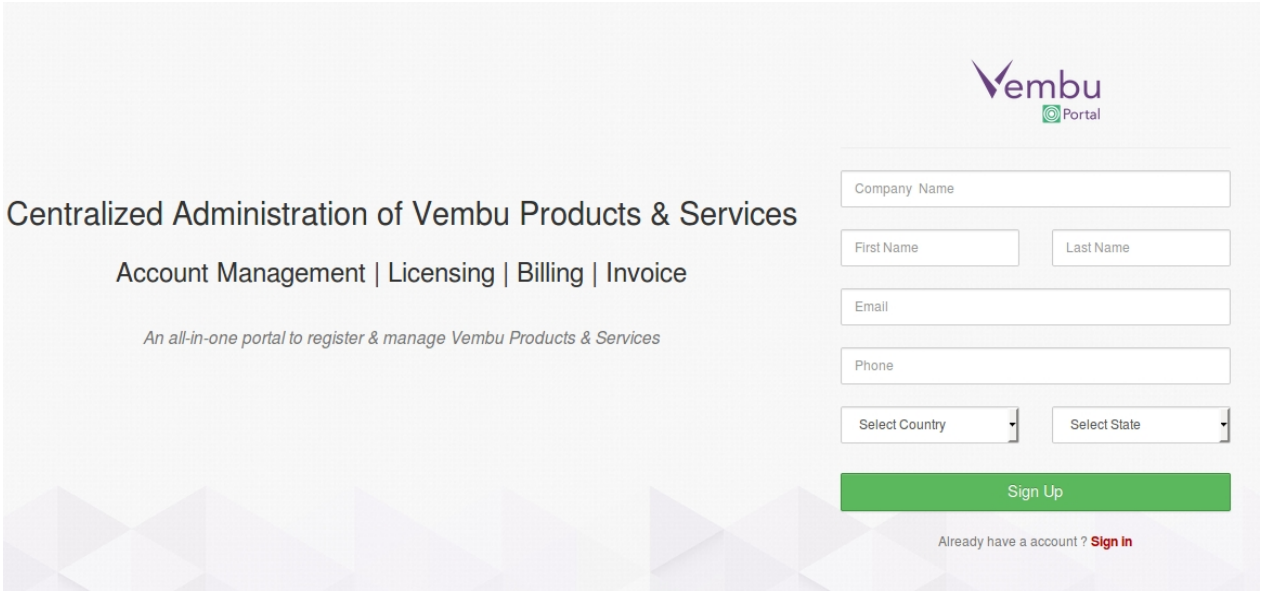
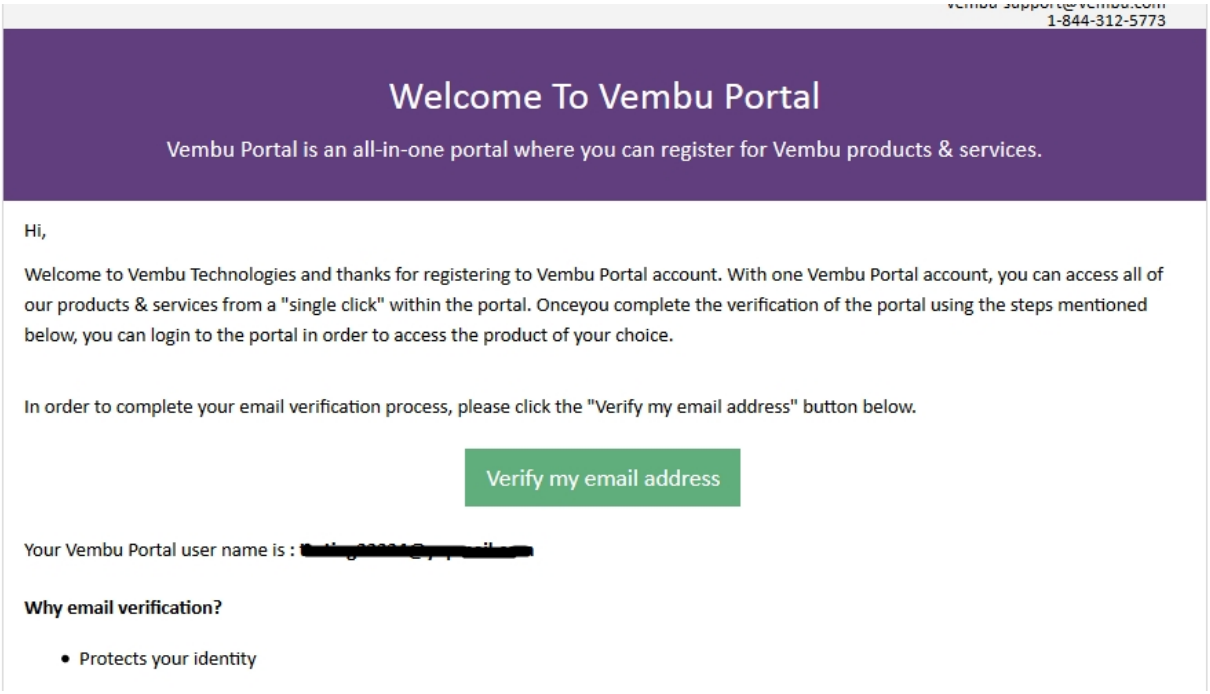
- Country and State



- Once done providing the requested details click Sign up to register.
- A verification Email will be sent to the registered Email ID. Kindly check your Inbox(Spam folder, if not found in Inbox) for verification email and click on 'Verify my email address'. If the button doesn't work copy-paste the link given below the 'Verify' button in your browser.



- You will be directed to a page with the registered email ID and you will be requested to create a password for your account. Once done providing password, click Activate.

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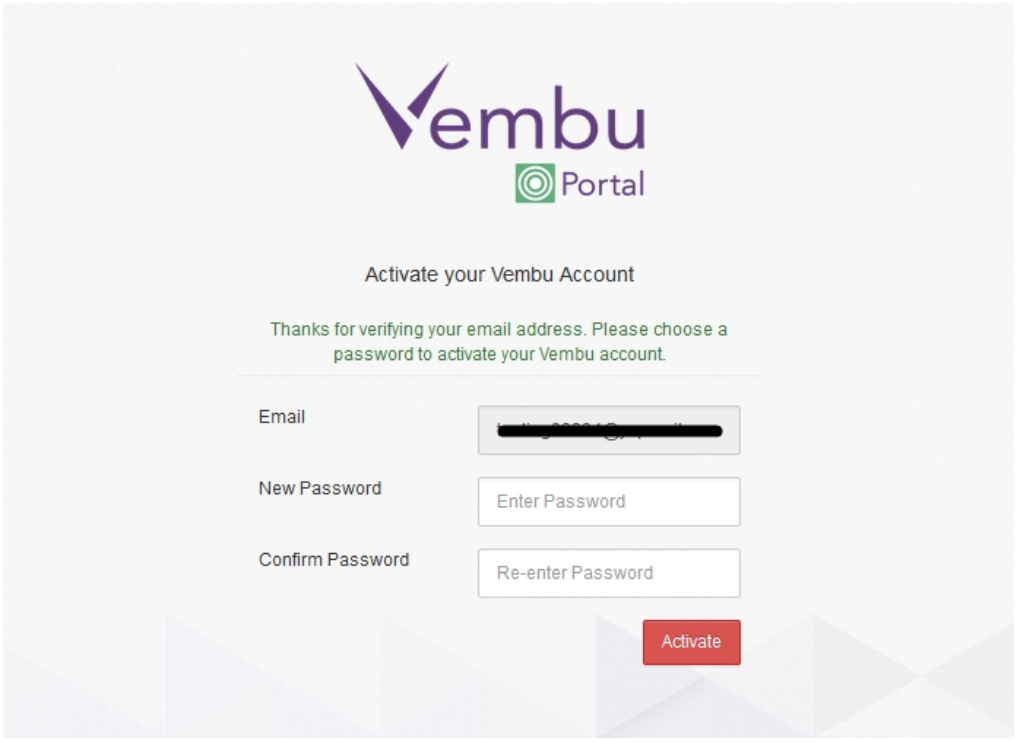


- Vembu portal account is now created successfully and you will be redirected to Vembu Portal login page. Login to Vembu portal account with the registered email id and password.

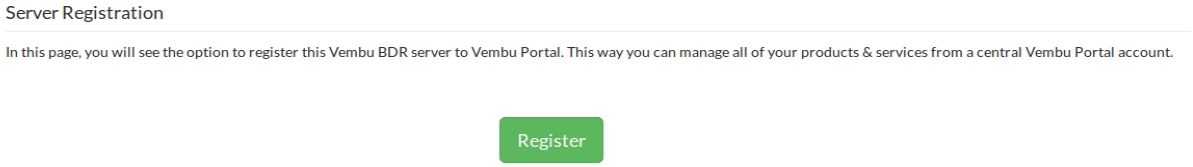
Server Registration:

Once Vembu portal account is created:

- Login to Vembu BDR web console.
- Go to 'Management → Server Management → Server Registration'

Steps to Register

- Click Register.



- Provide Vembu account credentials in the pop-up shown and register the trial.

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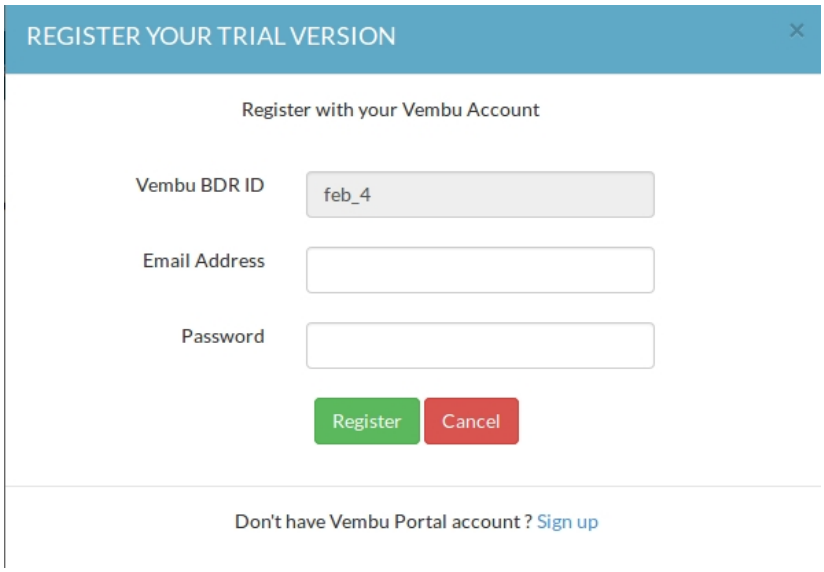

- Once registered, a user can check server registration by running a license check to success.

Evaluator's Guide for VMware Backup

Licensing

- Vembu charges for VMware backup based on no. of CPU Sockets
- If a VMware Server is deployed on a machine which has two CPU-Sockets, you need to buy two “VMware Image Backup” licenses and backup unlimited VMs
- The licenses have to be renewed every year
- License cost includes unlimited product upgrade and 24/7 email & telephone support

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