

Remove complexity in protecting your virtual infrastructure with IBM Spectrum Protect Plus

Data availability made easy

Overview

Challenge

In your organization, backup management is too complex and consumes too much time and too many IT resources.

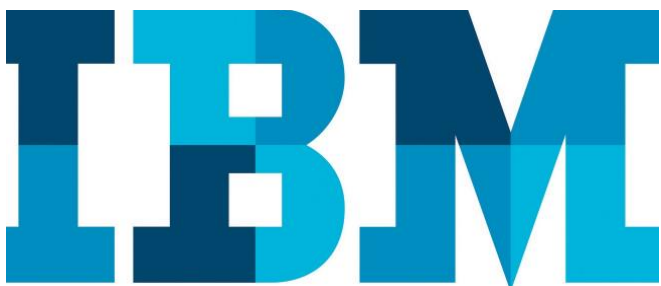
Solution

IBM Spectrum Protect Plus dramatically simplifies data protection for virtual environments by providing a modern, easy-to-use data protection solution.

Many enterprise organizations struggle with the complexity of protecting data in modern IT environments. Robust data protection involves complex procedures, many IT resources and weeks to get everything working together. Ongoing maintenance is an even greater challenge, with agent management and storage resource allocation. Fast access to the latest data for both traditional data protection use cases, as well as new use cases is required. Virtual environments are ubiquitous so delivering high availability for VMware environments is critical to an organization's success.

A data protection solution that focuses on virtual environments with easy set up and manageability is essential. It must provide data availability for recovery and data access, as well as for emerging use cases such as analytics and DevOps. For many large organizations, it also needs to be capable of delivering enterprise-proven scale, efficiency and data governance.

IBM Spectrum Protect™ Plus is a new data protection and availability solution for virtual environments that can unlock your valuable data for emerging use cases. You can deploy it in minutes and have your environment fully protected within an hour. IBM Spectrum Protect Plus can be implemented as a stand-alone solution or can integrate easily with your IBM Spectrum Protect environment to off-load copies for long-term storage and governance with scale and efficiency.



About this document

This white paper focuses on the deployment and basic setup of IBM Spectrum Protect Plus for protecting VMware. Readers will be taken through a step-by-step explanation of what is required to install and configure IBM Spectrum Protect Plus for basic backup and recovery of VMware virtual machines (VMs). Integration with Spectrum Protect for long-term data retention is also discussed.

Note that while Spectrum Protect Plus also supports virtual machines from Microsoft Hyper-V, this document is focused only on VMware.

IBM Spectrum Protect Plus overview

IBM Spectrum Protect Plus is a modern, easy-to-use data protection solution that simplifies backup administration while enabling rapid recovery of data. This solution leverages VMware data protection APIs and incremental-forever data copy technology to create backup copies, and stores these copies as addressable snapshot images on any storage device. This enables more point-in-time copies, resulting in more improved recovery point objectives.

IBM Spectrum Protect Plus creates and maintains a global catalog of all copies of VMs and optionally indexes files. This enables an administrator to see what is protected and more importantly, what isn't. When the need to recover data arises, this global catalog enables the administrator to quickly search and identify what they want to recover instead of browsing through hundreds of objects and recovery points. IBM Spectrum Protect Plus enables instant access and restore from the catalog so that an administrator can restore the organization's operations in a matter of minutes.

Integration with IBM Spectrum Protect enables administrators to tier data for long-term storage purposes, whether to disk, tape, cloud or object storage.

Restores are easily managed from within Spectrum Protect Plus when needed.

Spectrum Protect Plus Architecture

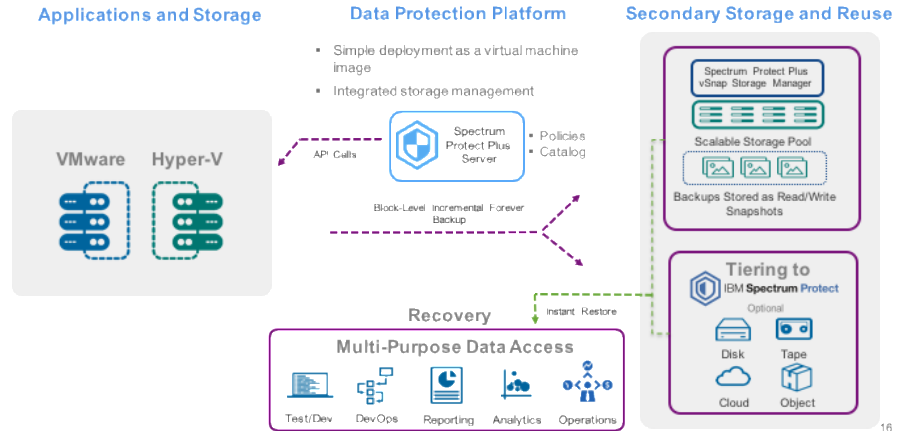


Figure 1 : IBM Spectrum Protect Plus overview

IBM Spectrum Protect Plus has two components:

- **Spectrum Protect Plus Server:** This centralized management server provides all management functions such as protection scheduling, indexing, searching and reporting.
- **vSnap Storage Server:** This is the data retention component that stores backup snapshots. The vSnap repository can be deployed as a virtual machine or on a physical server.

Deployment and configuration of IBM Spectrum Protect Plus

The IBM Spectrum Protect Plus server is delivered as a VMware OVA that is easily deployed on demand in a matter of minutes. The OVA includes vSnap repository components which are activated at first login. The vSnap components packaged in the Spectrum Protect Plus server are recommended only for small deployments, lab environments, testing and smaller projects.

Spectrum Protect Plus -vSnap Storage server can be deployed separately for backing up larger quantities of data. Additional vSnap servers are available in two options:

- **Virtual machines:** Similar to the Spectrum Protect Server, a vSnap Server is available as a VMware OVA image that can be deployed in a few minutes. This option is suitable for moderately-sized environments.
- **vSnap Installer:** vSnap is also available as an executable that can be installed on virtual machines and physical servers. Physical server

deployments are recommended for larger scale and larger sized environments.

In this document, we will address the virtual machine deployments of IBM Spectrum Protect server and vSnap Storage server.

To deploy the OVA package:

- Login to the vSphere web client
- Specify the location of the IBM Spectrum Protect Plus OVA
- Pick the Host and Network to run the appliance

Initial configuration

IBM Spectrum Protect Plus comes pre-packaged with all the required software components, including Spectrum Protect Plus Server and vSnap Storage Server. Alternatively, you may choose to deploy the vSnap Storage Server component on a separate virtual machine or physical server, as mentioned in the previous section.

Once the appliance is deployed and powered on:

- Login to the portal using web browser: `https://<hostname>:3000` where <hostname> is the IP address of the virtual machine where the IBM Spectrum Protect Plus™ is deployed.

The login screen appears as shown in Figure 2.

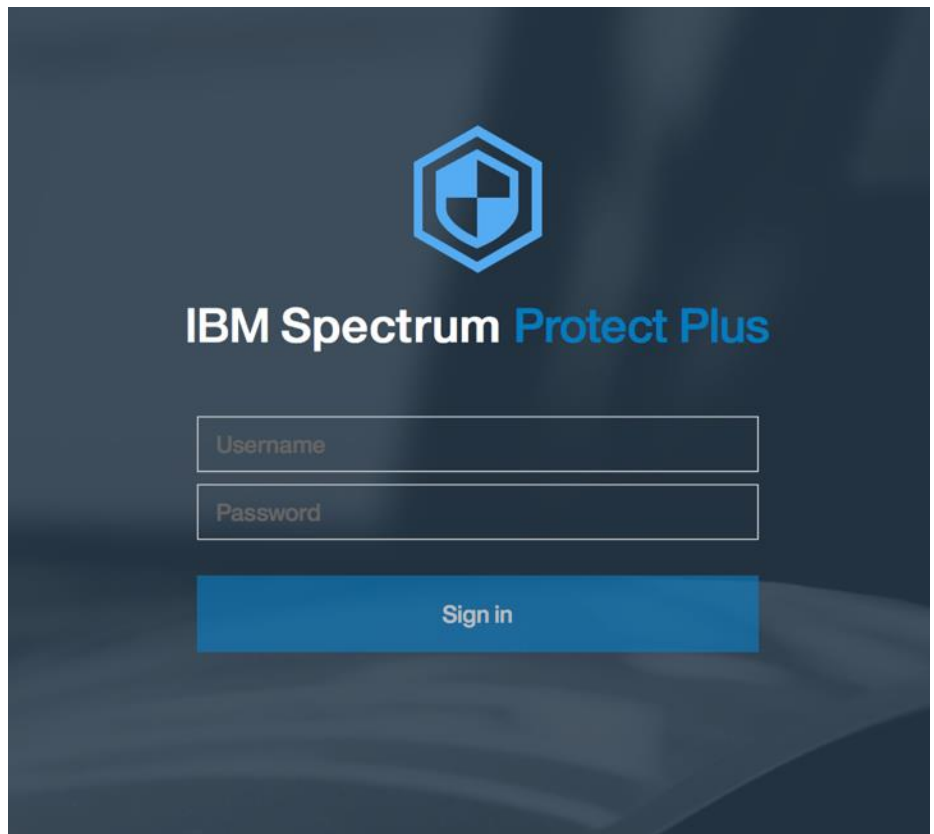


Figure 2: IBM Spectrum Protect Plus login screen

The default user name is admin and the default password is password. Users will be prompted to reset the default Super User password.

Once logged in, the main dashboard screen appears as shown in Figure 3

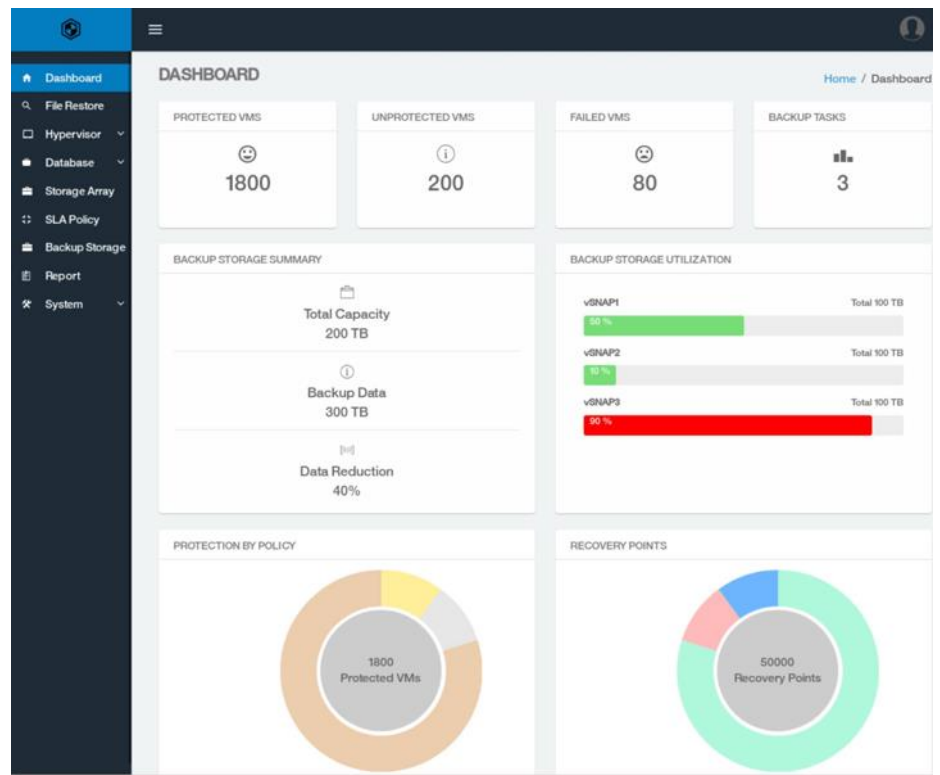



Figure 3: IBM Spectrum Protect Plus dashboard

vSnap Storage Server registration and initialization

IBM Spectrum Protect Plus-vSnap Storage Server is pre-packaged with the server deployment. Administrators will be prompted to initialize vSnap file system.

To register a new vSnap Storage Server:

1. From the Home screen menu, select Backup Storage. The Backup Storage screen opens as shown in Figure 4
2. Select  and fill in the IP Address, Userid and Password
3. Click Save to register

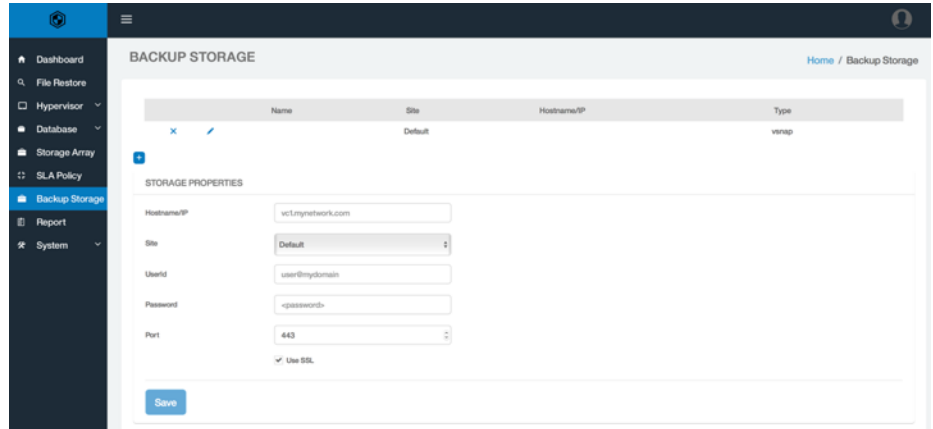


Figure 4: IBM Spectrum Protect Plus backup storage screen – Register vSnap

SLA policies

IBM Spectrum Protect Plus eliminates management complexity with just a few clicks through a single policy engine that orchestrates service level agreements (SLAs) across the entire data lifecycle. IBM Spectrum Protect Plus includes three pre-defined SLA policies (Gold, Silver and Bronze) as shown in *Figure 5* which can be easily used in VMware backups. In addition, IBM Spectrum Protect Plus enables customized SLA policies to meet specific backup requirements.

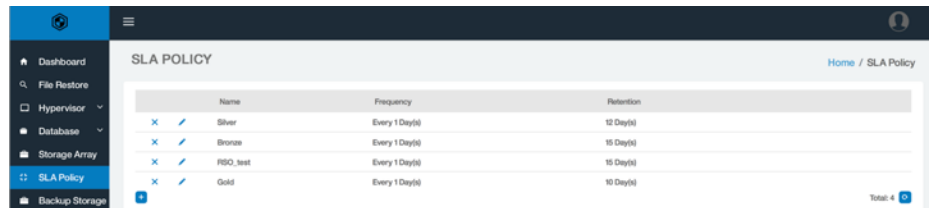


Figure 5: IBM Spectrum Protect Plus SLA Policy screen

SLA Policy defines the frequency and retention of backups to meet your RPO requirements as shown in Figure 6.


Figure 6: IBM Spectrum Protect Plus new policy screen

VMware backup

Creating a backup is easy with IBM Spectrum Protect Plus. Simply:

- Add the vCenter
- Select a VM that needs to be backed up
- Apply an SLA policy
- First step: Register the VMware vCenter server that you want to manage. This is a one-time agentless registration process.

To register a vCenter server:

1. From the Home screen menu, select Hypervisor->Backup->Vmware. The Backup Screen opens as shown in Figure 7.
2. To register the vCenter Server, select Manage VMware Server and click 
3. Fill in the IP Address, Userid and Password of the vCenter Server
4. Click Save to register

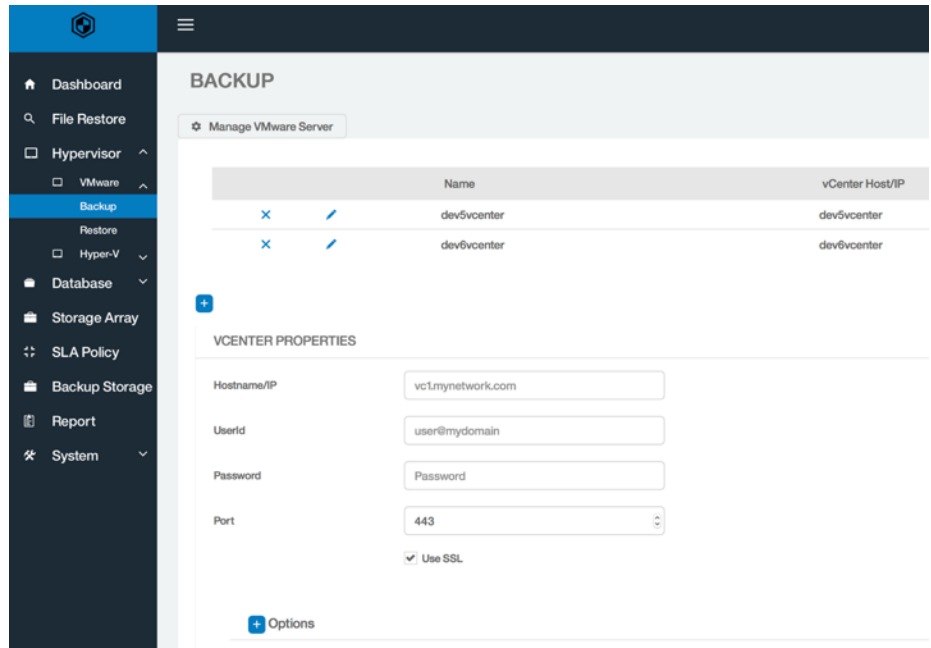


Figure 7: IBM Spectrum Protect Plus backup screen – Register vCenter server

Upon vCenter registration, IBM Spectrum Protect Plus automatically discovers the entire VMware environment. It catalogs metadata in a central repository enabling intelligent backups and analytical reporting of your VMware infrastructure.

IBM Spectrum Protect Plus backs up the VMware data, including virtual machines, data stores, folders, vApps and datacenters to vSnap Server. IBM Spectrum Protect Plus leverages VMware vSphere Storage APIs, as well as Changed Block Tracking (CBT) to reduce load on the vSphere host infrastructure and minimize backup window requirements.

Virtual machines objects such as data centers, clusters, vApps and resource pools can also be selected for backup. When a virtual machine is added to the protected object, it is automatically backed up. Likewise, when a virtual machine is removed from the container, it no longer is included in the backup job.

Recovery points are stored as space efficient snapshots on vSnap and preserved until expired by the retention period of the selected SLA policy.

IBM Spectrum Protect Plus leverages the Change Block Tracking (CBT) features of VMware vSphere to provide a fast incremental forever backup scheme. This allows administrators to create more frequent backups with minimal impact.

Define a VMware backup:

1. From the Home screen menu, select Hypervisor->VMware->Backup

2. Browse or Search and select VMs for backup as shown in Figure 8
3. Click “Select SLA Policy”. Then select a pre-defined policy (Gold, Silver, Bronze) or a custom-created policy matching your backup frequency and retention requirements
4. Click “Select Options” and assign settings, as needed
5. Click Save to create a backup job

Backups of selected VMs will now run in accordance with the selected SLA policy.

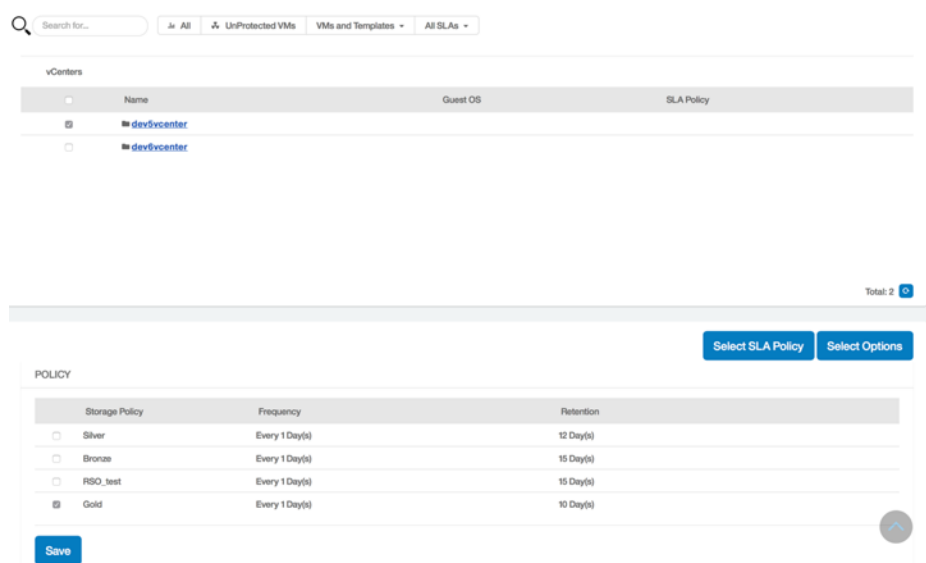


Figure 8: IBM Spectrum Protect Plus backup screen – Backup selection

Backup options

IBM Spectrum Protect Plus provides additional options for advanced backup users.

- Make VM snapshot application/filesystem consistent. This option enables application consistent backups of Microsoft Applications such as Exchange, SharePoint, SQL Server, and Active Directory leveraging VMware tools and VSS snapshots.
- Enable Log Truncation: This option automates SQL Server log management by providing the option to automatically truncate log post backups.
- Enable File Recovery: This option is enabled at the VM level to index and catalog files within a virtual machine.

Note: The Enable File Recovery option needs to be selected before backup in order to perform File Search and Recovery.

VMware backup (VADP) proxies

Backup proxy is a software component of IBM Spectrum Protect Plus that is responsible for data movement between the VMware infrastructure and vSnap


Storage Server. IBM Spectrum Protect Plus Server has a built-in backup proxy which is sufficient backup for a small-sized environment. Additional backup proxies can be installed on a virtual machine or a physical server depending on the environment requirements.

IBM Spectrum Protect Plus provides two modes of deployment for backup proxy server:

- A backup proxy OVA that can be easily deployed in a VMware VM
- Installer package that can be deployed on a physical server

Once additional backup proxies have been deployed and registered, IBM Spectrum Protect Plus will intelligently load balance backup processing among available proxies to reduce the backup window.

To register a VADP proxy:

1. From the Home screen menu, select System->VADP Proxy. The VADP Proxy screen opens as shown in Figure 9
2. Select  and fill in the IP Address, Userid and Password
3. Click Save to register

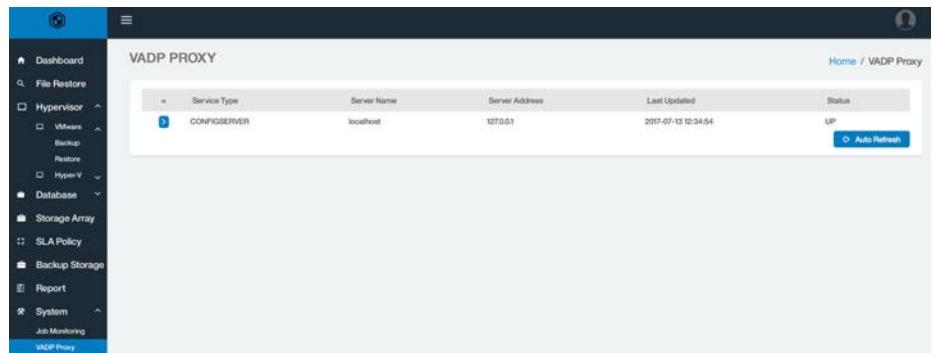


Figure 9: VADP Proxy registration

VMware recovery

IBM Spectrum Protect Plus provides instant access to your backed up VMware data to ensure real-time recovery without impacting your production environment. A virtual machine can be instantly recovered from any zero footprint snapshot copy and be later turned to production restores with just a few clicks. Recoveries can be done at different granularities. Spectrum Protect Plus enables administrators to recover entire data stores, vApps, folders, virtual machines and virtual machine disks(vmdks). Spectrum Protect Plus also provides global file search and restore capability to easily find files across several virtual machines and multiple backup copies.

To Define a VMware restore

1. From the Home screen menu, select Hypervisor->VMware->Restore
2. Browse or Search and select VMs for restore as shown in Figure

3. Optionally, you can select a specific recovery point by further drilling down on a selected VM
4. Select appropriate restore type under Options
5. Select restore destination under Options (Original or Alternate Host or Cluster)
6. Optionally, select Advanced Options to assign appropriate settings
7. Select Save to create a Restore job
8. Select to run Restore or Scheduled Restore as shown in Figure 10

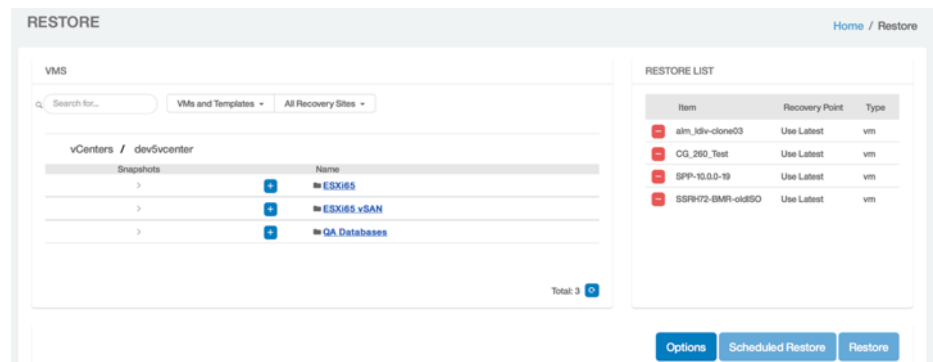


Figure 10: IBM Spectrum Protect Plus Restore Screen – VM selection:

VMDK restores:

1. From the Home screen menu, select Hypervisor->VMware->Restore
2. Browse or Search and select VMs for restore as shown in Figure 11
3. Click on a VM to see available VMDKs for restore as shown in ??
4. Optionally, you can select a specific recovery point by further drilling down on the selected VMDK
5. Select appropriate Restore type under Options
6. Select Restore destination under Options (Original or Alternate Host or Cluster)
7. Optionally, select Advanced Options to assign appropriate settings
8. Select Save to create a Restore job
9. Select to run Restore or Scheduled Restore

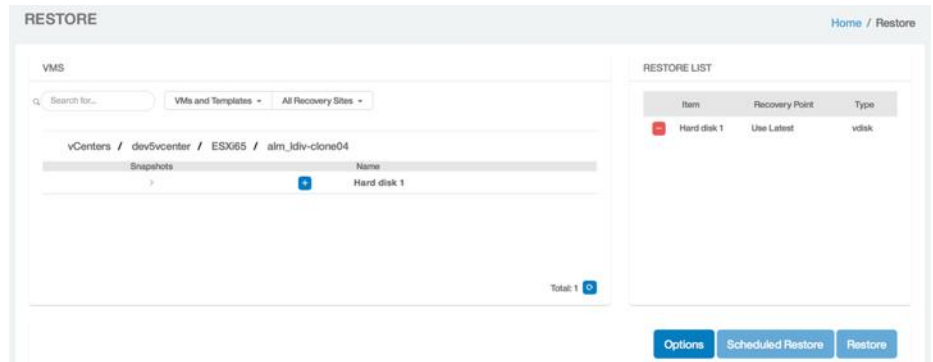


Figure 11: IBM Spectrum Protect Plus Restore Screen – VMDK Restore

Once your restore job starts, monitor the progress of the activities on the Restore screen as shown in **Error! Reference source not found.**

IBM Spectrum Protect Plus provides three modes of recovery as shown in Figure

- Instant Test Mount: In this mode, Spectrum Protect Plus instantly spins up a VM directly from the backup copy.
- Instant Restore: This mode instantly spins up the copy of a VM from a backup similar to the Instant Test Mount and performs the additional step of restoring the data from the backup repository to the VMware datastore. There are two options for Instant Restore:
 - Retain Production VM Settings: This option retains the original VMs unique identifiers. This mode is typically intended for the user to perform recovery in disaster recovery situations back to the original production VM.
 - Clone VM with new VM settings: This option creates new identifiers to the VM. Clone option is suited for development or testing and for creating new environments.

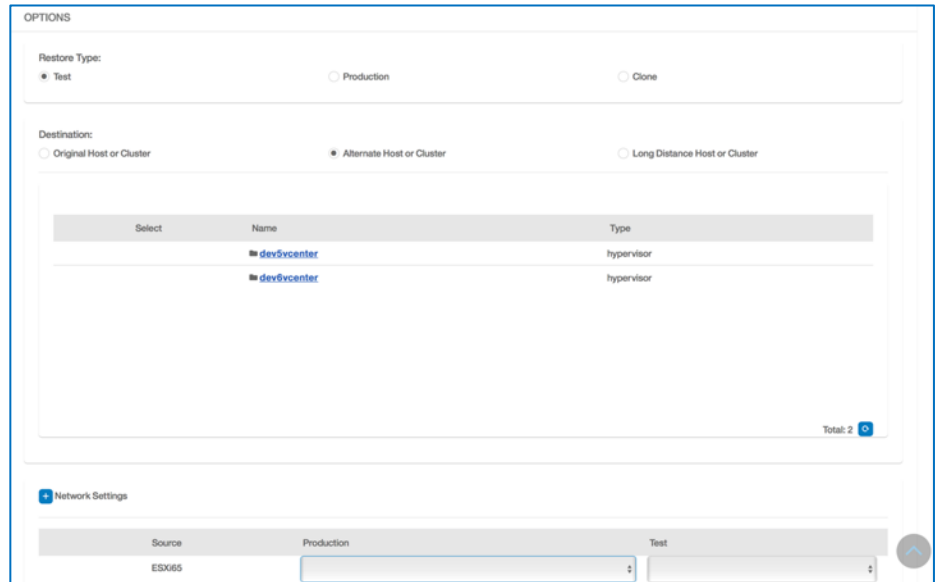


Figure 12: IBM Spectrum Protect Plus restore screen – Restore options

- Administrators can also choose the destination for recovery. By default, the VMs or VMDKs are restored back to the original VMware ESXi Host. Administrators can choose to restore to an alternate ESXi Host as shown in Figure 12.

Additional network settings can be applied to the VM, as well. IBM Spectrum Protect Plus enables administrators to choose a different network segment and/or re-map the IP address scheme of the VM as shown in Figure 13

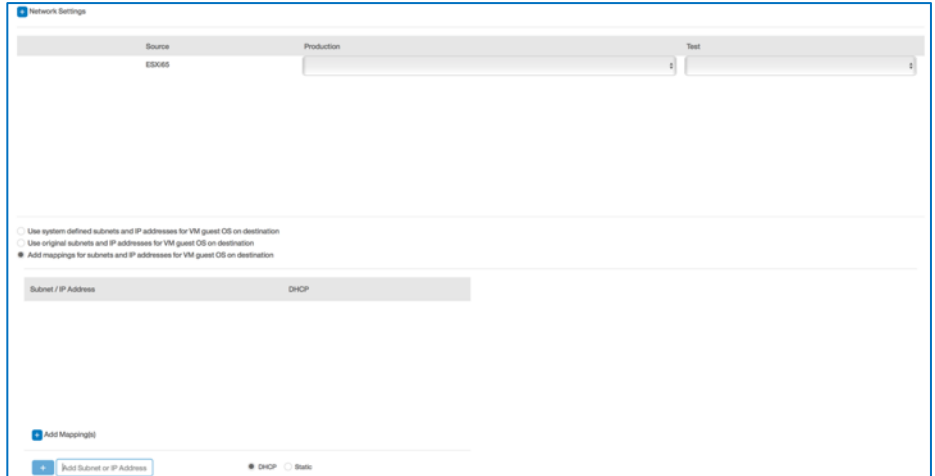


Figure 13: IBM Spectrum Protect Plus restore screen – Network Settings

Global File Search and Recovery

IBM Spectrum Protect Plus is built on a highly scalable software-defined platform that enables instant access to a global enterprise-wide index and catalog of metadata. Spectrum Protect Plus leverages these metadata indices to enable intelligent backup and recovery.

In the VMware Backup, IBM Spectrum Protect Plus provides an option to catalog file within a VM. This allows the solution to provide global search and recovery of individual files or folders. File Restore allows users to search within VMs across the entire VMware infrastructure.

Restoring files:

1. From the Home screen menu, select the File Restore menu
2. The File Restore screen opens as shown in Figure 14
3. Type file pattern to search for files
4. Apply additional filters to narrow the file search
5. Select files (latest or specific versions)
6. Select options to search and select restore destination
7. Select file overwrite behavior (replace or fail)
8. Select Save to create Restore File job
9. Select Restore to start Restore File job

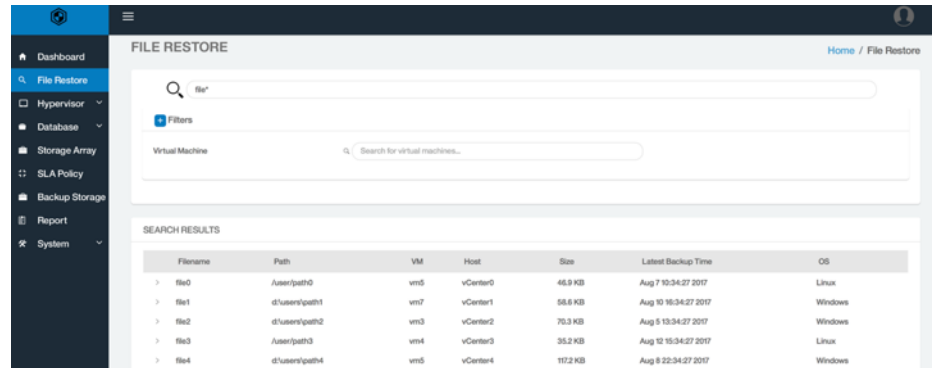




Figure 14: IBM Spectrum Protect Plus File Restore Screen

IBM Spectrum Protect offload

IBM Spectrum Protect Plus integrates with IBM Spectrum Protect to offload VM backups to IBM Spectrum Protect Server. Offloading to Spectrum Protect is applicable for long-term retention and archiving. The first step in the offload process is to register the Spectrum Protect Virtual Environment (VE) data movers.

To register Spectrum Protect VE:

1. From the Home screen menu, select Hypervisor->Backup->Vmware. The Backup Screen opens as shown in Figure 4.
2. To register the Spectrum Protect VE server, select Manage VMware Server
3. Edit the vCenter that is already registered or enter the ?? and click  to register new vCenter
4. Click the  Spectrum Protect VE Server as shown in Figure 15
5. Fill in the IP Address, Userid and Password of the vCenter server
6. Click Save to register

The screenshot shows a web form titled '+ Spectrum Protect VE Server'. Below the title is a checkbox labeled 'Link to Spectrum Protect Server'. Underneath are five input fields: 'Hostname/IP' with the value 'vc1.mynetwork.com', 'Type' with a dropdown menu showing 'Windows', 'UserId' with the value 'user@mydomain', and 'Password' with the placeholder text 'Password'. At the bottom left of the form is a blue 'Save' button.

Figure 15: IBM Spectrum Protect Plus Spectrum Protect Offload- VE Registration

The SLA policy menu controls the feature to offload to Spectrum Protect. Create or Edit an SLA policy

1. Click Spectrum Protect Offload and select the checkbox to Enable the offload process as shown in Figure 16
2. Click Save to create new SLA policy
3. Associate this SLA policy in VMware->Backup to the VMs that you want to offload to Spectrum Protect

The screenshot shows a web form titled '+ Spectrum Protect Offload'. Below the title is a checkbox labeled 'Offload to Spectrum Protect'.

Figure 16: IBM Spectrum Protect Plus SLA screen – Spectrum Protect offload

IBM Spectrum Protect Plus leverages Spectrum Protect APIs to control the backup and recovery operations. Once VMs are successfully offloaded to Spectrum Protect, IBM Spectrum Protect Plus catalogs the VMs' metadata, including offload locations in its central catalog. This enables Spectrum Protect Plus to restore directly from Spectrum Protect Server.

Reports and analytics

We can also run analytics on the data collected within the Spectrum Protect Plus catalog. The Report Menu provides access to several key

reporting options, which can be leveraged for day to day activities.

We will review a few reports in particular. Figure 17 shows a Hypervisor RPO compliance, including details of the VMware objects and the compliance based on the defined SLAs. It also displays the recovery points in all the different locations.



Hypervisor RPO Compliance

Report Properties

Creation Date: August 10, 2017 5:47:41 PM UTC
Report Generated By: admin

Report Filters:

Hypervisor Type: (All)
Hypervisor: (All)
Display VMs That Are: In Compliance, Not In Compliance

Quick View



Overall Compliance Status

- In Compliance - 7
- Last Run Failed - 1
- Not In Compliance - 0

Summary View

SLA Policy	SLA Schedule	VMs In Compliance	VMs Not In Compliance	VMs with Last Run Failed
SLA_1week	Every 1 Week(s)	2	0	1
SLA_Bld220_1d_5copy	Every 1 Day(s)	3	0	0
SLA_daily	Every 1 Day(s)	2	0	0
Total		7	0	1

Figure 17: Hypervisor RPO Compliance Report

The Protected VMs Report shows the count of all VMs that have at least one recovery point in the Spectrum Protect Plus catalog as shown in Figure 18. It also displays the source capacity of each VM.



Protected VMs

Report Properties

Creation Date: August 11, 2017 12:10:50 AM UTC
Report Generated By: admin

Report Filters:
Hypervisor Type: (All)
Hypervisor: (All)

Summary View

Hypervisor	Hypervisor Type	VMs	Managed Capacity
vcqa2.ad.catalogic.us	VMware	10	42.00 GB
Total		10	42.00 GB

Detail View - VMware

VM	Hypervisor	Managed Capacity
SSPrHy_VM5	vcqa2.ad.catalogic.us	1.00 GB
SSPrHy_VM3	vcqa2.ad.catalogic.us	1.00 GB
SSPrHy_VM4	vcqa2.ad.catalogic.us	1.00 GB
SSDummyPrHy	vcqa2.ad.catalogic.us	1.00 GB
dummyTest	vcqa2.ad.catalogic.us	0 B
SSPrHy_VM2	vcqa2.ad.catalogic.us	1.00 GB
SSPrHy_VM10	vcqa2.ad.catalogic.us	1.00 GB
SSPrHy_VM11	vcqa2.ad.catalogic.us	1.00 GB
SSWin2k16-dhcp	vcqa2.ad.catalogic.us	35.00 GB
SSPrHy12	vcqa2.ad.catalogic.us	1.00 MB
Total VMs: 10		42.00 GB

Figure 18: Protected VMs report

These reports can be scheduled or run on demand. They can be made available in different formats, such as HTML, PDF and CSV.

Summary

In this white paper, we have demonstrated how to manage, orchestrate and automate disaster recovery processes using IBM Spectrum Protect Plus for VMware environments.

The white paper also reviews how to orchestrate and manage multiple copies of data for building on-demand testing and development of your IT infrastructure environment in a virtualized VMware environment. You can use an intuitive user interface, SLA policies and automated storage management capabilities.

The detailed steps on the configuration process for IBM Spectrum Protect Plus and the use case discussed in this paper are available at:

<https://www.youtube.com/watch?v=QXTqm2eEmzI>

Get more information

The following websites provide useful references to supplement the information contained in this paper.

- IBM Spectrum Protect Plus User Guide
https://www.ibm.com/support/knowledgecenter/SSNQFQ_10.1.0/spp/SPP_UsersGuide.pdf?view=kc
- IBM Spectrum Protect Plus Knowledge Center
https://www.ibm.com/support/knowledgecenter/en/SSNQFQ/landing/welcome_ssnfq.html

If you'd like to speak with an IBM representative about this product, please:

- call 1-877-426-4264 or
- email <https://www-01.ibm.com/marketing/iwm/dre/signup?source=MAIL-storage>



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