IBM Client Center Montpellier - France

IBM **Spectrum Protect & Spectrum Protect Plus**
Technical overview with live Demonstration

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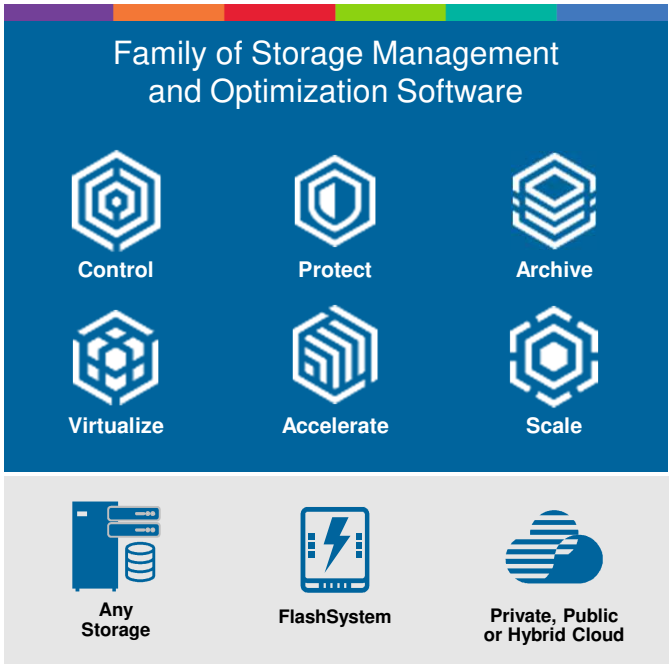
IBM Spectrum Storage Family

IBM's software defined storage family



IBM Spectrum Control	Analytics-driven hybrid cloud data management to reduce costs by up to 73%
IBM Spectrum Protect	Optimized hybrid cloud data protection to reduce backup costs by up to 53 percent
IBM Spectrum Archive	Fast data retention that reduces TCO for active archive data by up to 90%
IBM Spectrum Virtualize	Virtualization of mixed block environments stores up to 5x more data
IBM Spectrum Accelerate	Enterprise block storage for hybrid cloud deployed in minutes instead of months
IBM Spectrum Scale	High-performance, highly scalable hybrid cloud storage for unstructured data

http://www.smartercomputingblog.com/smarter-storage/what-is-software-defined-storage-economics/

Spectrum Protect Family of Products

Spectrum Protect Server Products

Spectrum Protect Suite
- *Capacity priced bundle of Spectrum Protect and popular agents*
- *Entry option for smaller facilities*

Spectrum Protect
- *Scalable backups with unified recovery*
- *Deduplication (source and target)*
- *Spectrum Protect Operations Center GUI*

Spectrum Protect Extended Edition (Basic plus..)
- *Disaster Recovery Management*
- *Node replication*
- *Backup via NDMP for NAS*
- *Large Tape Library support*

Spectrum Protect for Storage Area Networks (SAN)

Frontsafe Cloud Portal (reseller)
- *Multi-tenancy*
- *Invoicing*

Rocket Servergraph Progessional (reseller)
- *Reporting and monitoring for multi-vendor backup software and VTL environments*

Application Protection
- Spectrum Protect for Mail
- Spectrum Protect for Databases
- Spectrum Protect for Enterprise Resource Planning
- Spectrum Protect for Virtual Environments
- Spectrum Protect Plus
- DocAve Backup and Restore for SharePoint (reseller)

Snapshot Management
- Spectrum Protect for Snapshots
- **IBM Copy Data Management**
- Rocket Device Adapter Pack for IBM Spectrum Protect Snapshot, includes adapters for EMC, Hitachi, HP, and NetApp Clust

Space Management, Archiving
- Spectrum Protect for Space Management
- Spectrum Protect HSM for Windows
- System Storage Archive Manager

Desktop / Laptop
- Spectrum Protect for Workstations

Bare Machine Recovery
- System Backup and Recovery (AIX)
- Cristie Bare Machine Recovery (reseller)
- Cristie TBMR (reseller)

z/OS
- Spectrum Protect for z/OS Media
- Spectrum Protect EE for z/OS Media

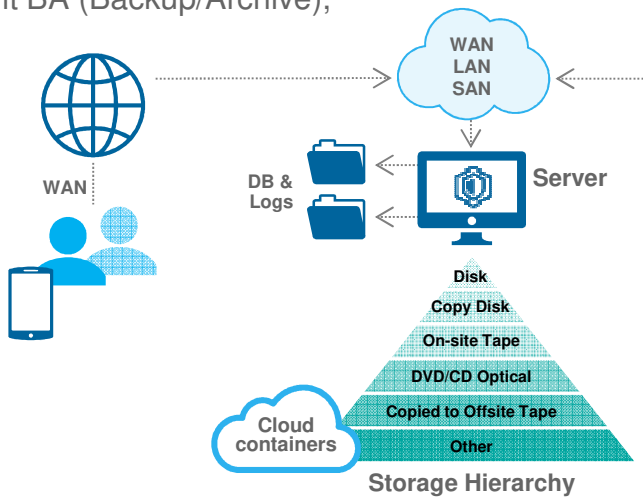
Spectrum Protect's Architecture

Spectrum Protect **Server**
- Spectrum Protect server code
- Meta data stored in **DB2 DB** and Logs
- Physical data stored in **storage pools** on various **storage devices** or in the **cloud**

Spectrum Protect **Clients**
- Spectrum Protect client BA (Backup/Archive),
- HSM (File migration)
- API (Application)

Communication :
- LAN (TCP/IP)
- SAN (FC)
  - LFB - Lan Free Backup
  - NDMP - Network Data Management Protocol

Connexions :
- LAN
- SAN
- WAN



Benefits of Spectrum Protect's Architecture
- Power and scalability of DB2
  - Robust, Scalable, Available
  - High Performance
  - Easier to Manager
  - Ensures Data Integrity
- Flexible storage hierarchy

Storage Devices grouped in **Storage Pools**
- **Devclass** (Traditional storage) :
  - Random (Disks)
  - Sequential (Tapes, Virtual tapes, Disks)

- **Directory container** (local)
- **Cloud container** (Objects)

Containers : **Inline deduplication** + **LZ4 compression** (optional)

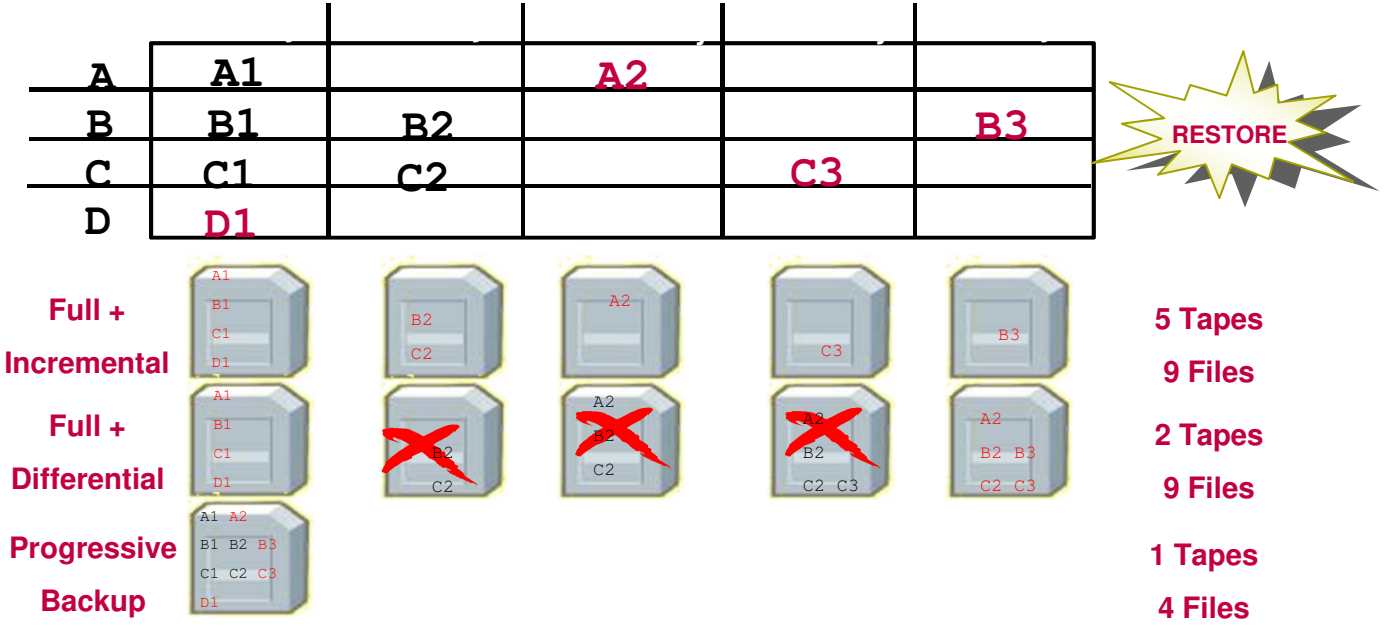
Spectrum Protect – Progressive Incremental Backup

Progressive Incremental Backup

- Often called "**Incremental Forever**"
- Only New or changed files are backed up
- No redundant or wasted full backups
- Data tracked at file level, Accurately restore files to a point in time

Benefits

- Requires less storage space, less network bandwidth and less time
- **Shorter backup windows**
- **Faster accurate restore**



Spectrum Protect – Backup

Data Protection

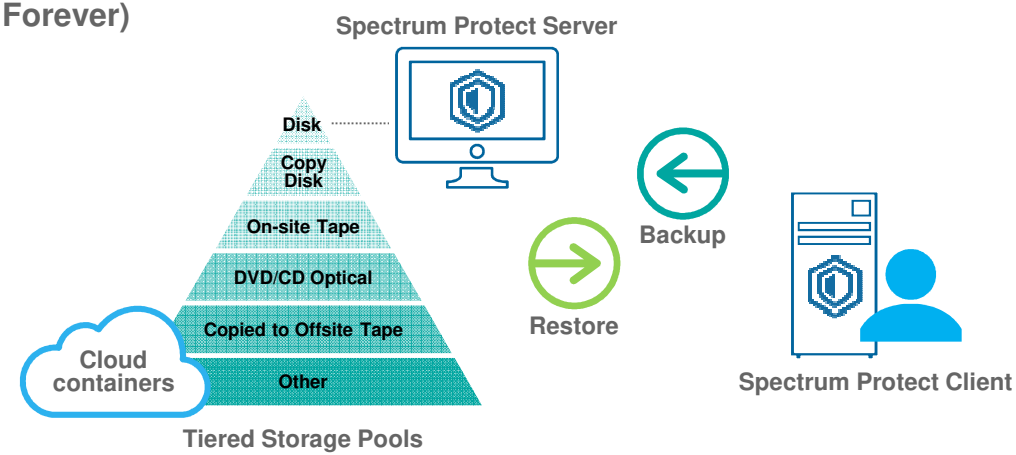
- Multiple versions kept
- **Policy managed**
- System assisted restore
- Automated scheduling

Types of Backup

- **Progressive incremental (Incremental Forever)**
- Volume level
- Bare metal

Benefits of Spectrum Protect's Backups

- Automatically recover files or fs quickly
- Automated off-site copy creation
- Set policies to optimize backup granularity
- Store backups in tiered storage
- Single point of control



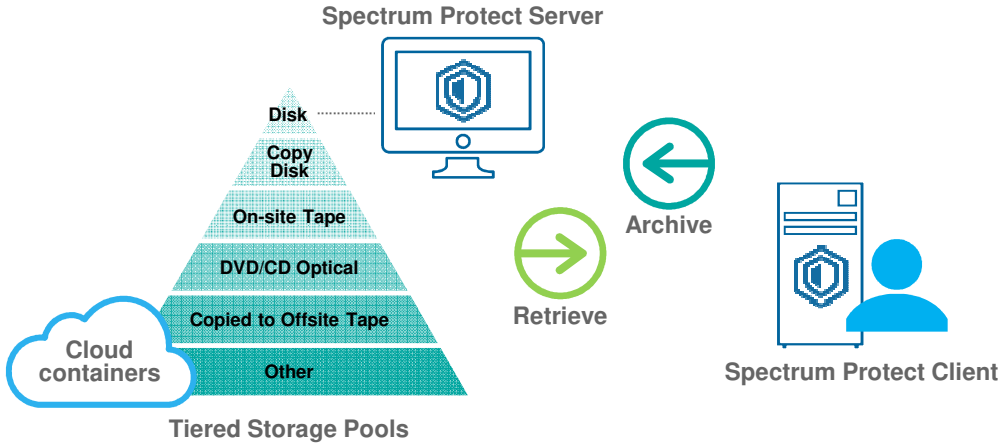
Spectrum Protect – Archive

Long Term Retention

- Time based retention
- Long-term storage
- Point in time copy

Benefits of Archive

- Speed file-server recovery
  - Recover only active data
- Reduce backup times & resource usage
  - Focus on active files only
- Expedite locating historical information
  - Index archives with descriptive metadata



Policy Management

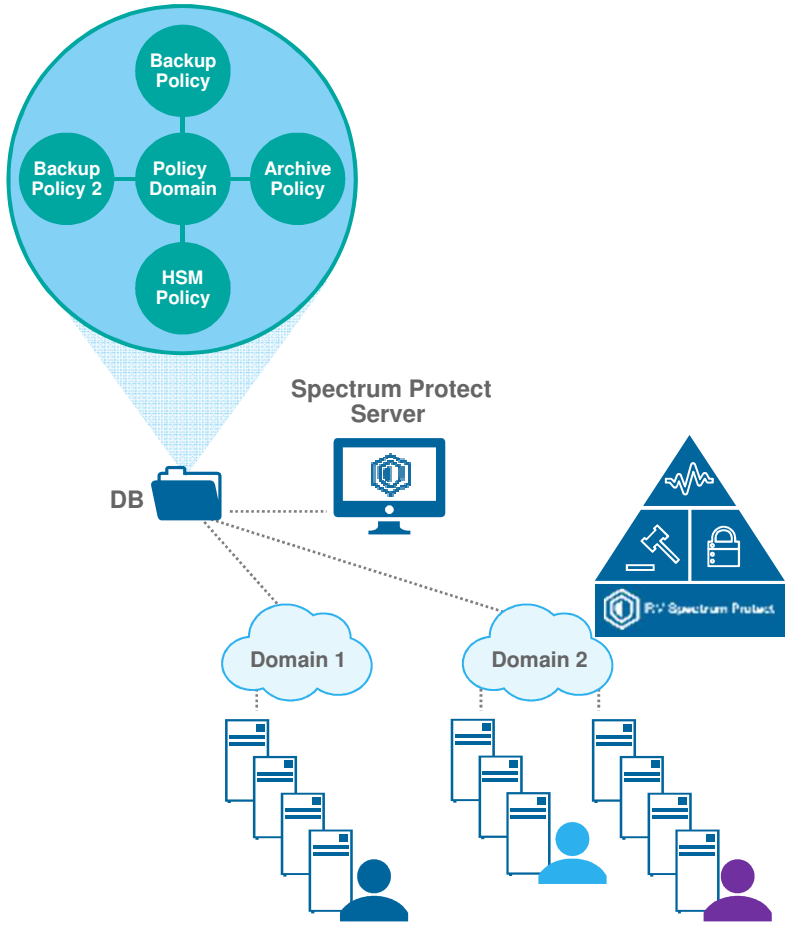
Policies

A **set of rules** that defines :

- What data to protect
- Where to store the data
- How long to keep it

Benefits

- Flexible policies meet business needs
- Policies can change as needs change
- Changes retroactively applied to existing data

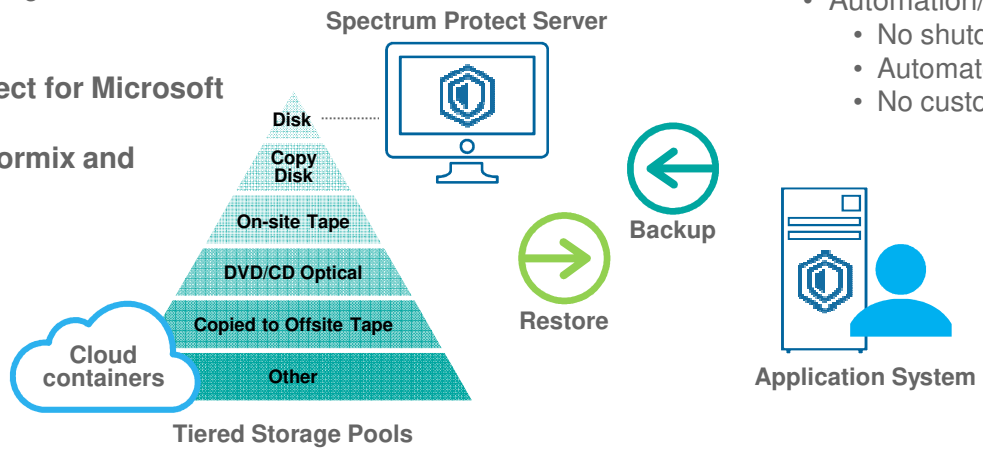


How to protect databases and applications

API Client

On-Line Protection

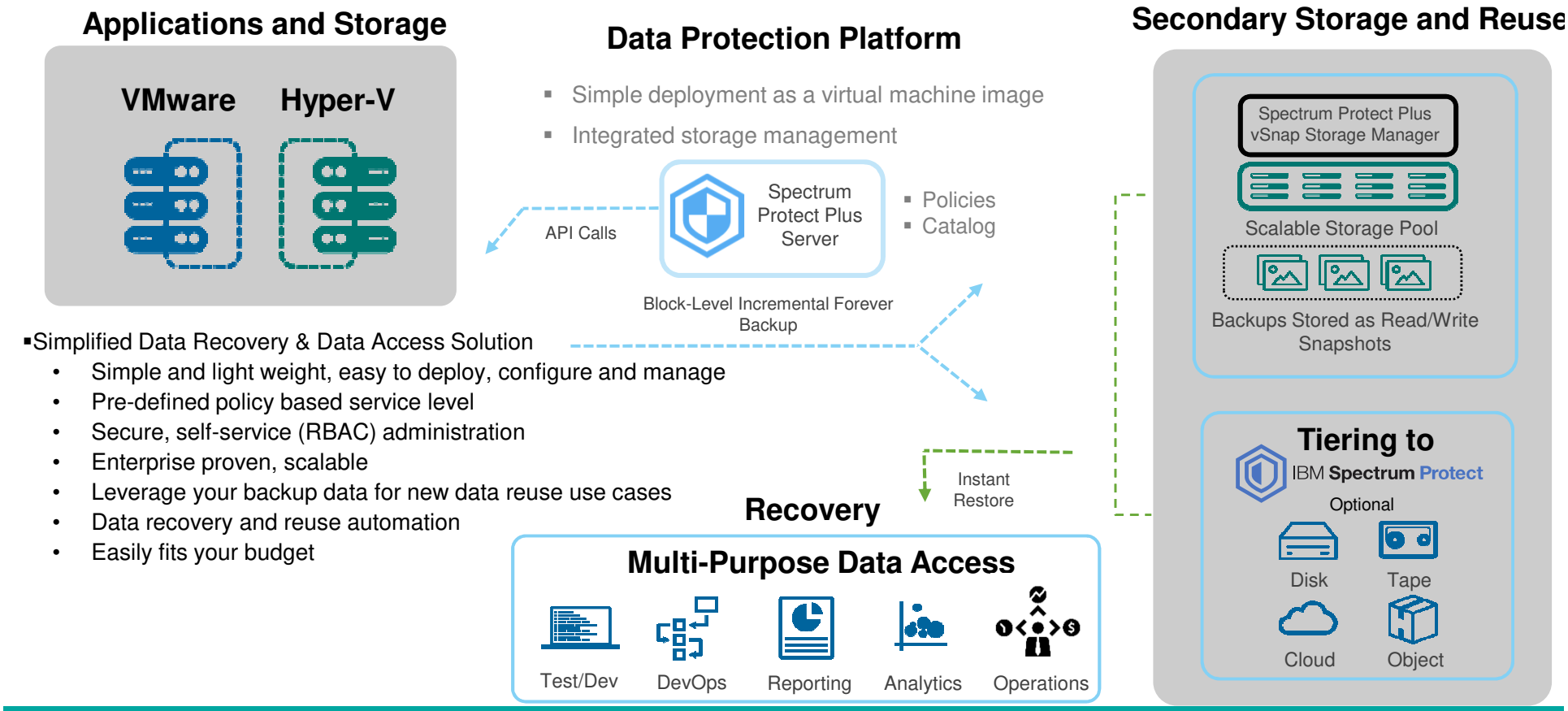
- **Spectrum Protect for Mail**
  - Lotus Domino
  - MS Exchange
- **Spectrum Protect for Databases**
  - Oracle
  - MS SQL
- **Spectrum Protect for Enterprise** Resource Planning
  - SAP/R3
  - SAP Hana
- **Spectrum Protect for Microsoft** SharePoint
- **Support for Informix and DB2** built in



Benefits of Spectrum Protect for

- Online (hot) backup
  - 24x7 application availability
  - No downtime
- Incremental backup
  - Minimize data to store & maintain
  - Faster backups
- Data integrity
  - Use of certified application APIs
  - Automated, consistent backup of all needed files
- Automation/Scheduling
  - No shutdown required
  - Automated restore of consistently backed up files
  - No customized scripts and manual interaction

Virtual machines protection : Spectrum Protect Plus (detailed later)



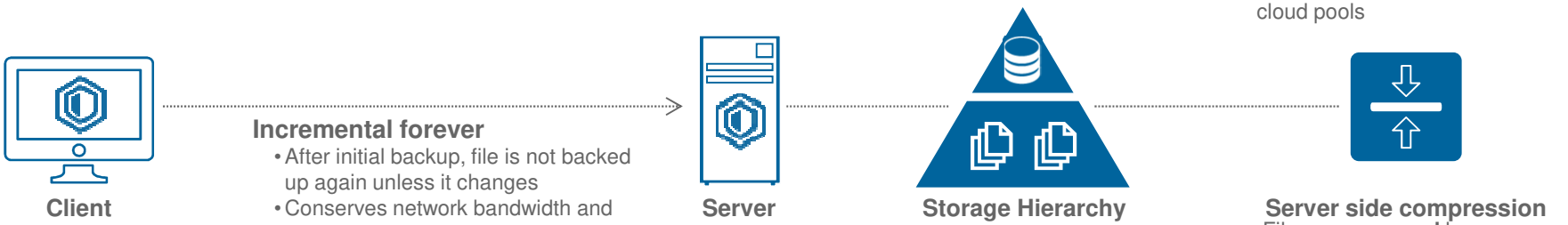
- Simplified Data Recovery & Data Access Solution
  - Simple and light weight, easy to deploy, configure and manage
  - Pre-defined policy based service level
  - Secure, self-service (RBAC) administration
  - Enterprise proven, scalable
  - Leverage your backup data for new data reuse use cases
  - Data recovery and reuse automation
  - Easily fits your budget

Spectrum Protect data reduction techniques

Client compression
- Files compressed by client before transmission
- Conserves network bandwidth and server storage

Device compression
- Compression performed by storage hardware
- Conserves server storage

Server Side Deduplication
- Duplicate data only stored once
- **Out-of-band dedupe** to disk pool
- **In-line dedupe** to directory or cloud pools



Incremental forever
- After initial backup, file is not backed up again unless it changes
- Conserves network bandwidth and server storage

Server side compression
- Files **compressed** by server after **in-line dedupe** for containers
- Conserves network bandwidth when writing to cloud

Client Side Deduplication
- Reduces network traffic by deduplication data before transfer
- Sends to server's dedupe pool

Appliance deduplication
- Deduplication performed by storage appliance (VTL or NAS)
- Conserves server storage

Deduplication is an integrated part of Spectrum Protect

Spectrum Protect – Disaster Recovery with Node Replication

Node (Client) Replication

- Incrementally transfer copies of to a second Spectrum Protect server
  - Provides off-site copies
  - **Deduplication maintained across servers**
  - Automatically repairs damaged primary files
- Can store more or fewer versions on the Source and Target server
- Client restores automatically failover to target for restores if primary server is down

Benefits of Node Replication

- Incremental transfer of files
- Automatically send off-site copies to another Spectrum Protect server
- Seamless disaster recovery of files

Clients Spectrum Protect HSM

Lifecycle Management

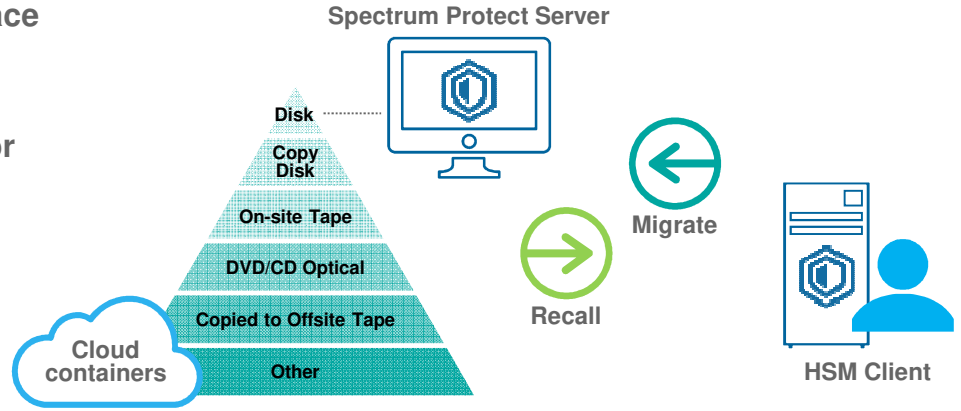
- **Migrates inactive data**
- Transparent recall
- Policy managed
- Integrated with backup

Two products :

- **Spectrum Protect for Space Management**
- **Spectrum Protect HSM for Windows**

Benefits

- Improve response times of file servers by off-loading inactive data
- Move low-activity or inactive files to a hierarchy of lower-cost storage
- Use existing storage assets more efficiently
- Reduce backup times and resource usage by focusing on active files only
- Eliminate manual file system clean-up activities



ibm.com/software/tivoli/products/storage-mgr-space/

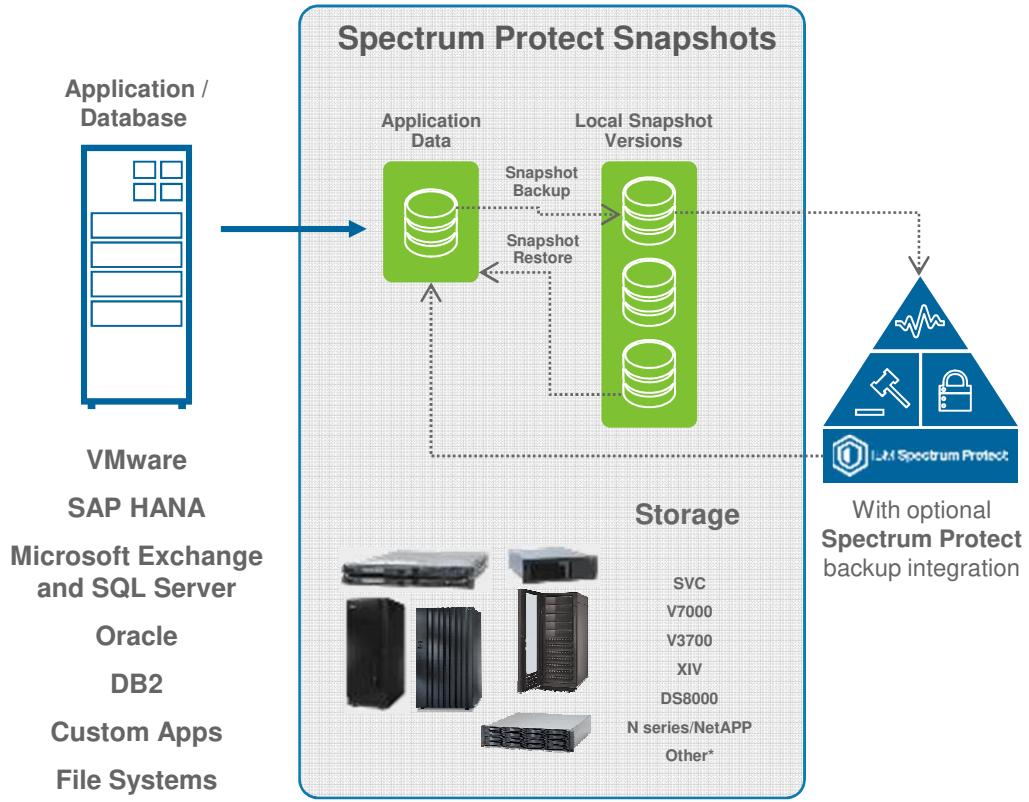
Spectrum Protect Snapshot

Spectrum Protect Snapshot

- Online, near instant snapshot backups with minimal performance impact
- High performance, near instant restore capability
- **Integrated with Storage Hardware**
- Simplified deployment
- Database Cloning

Benefits

- Nearly instant online backup
- Multiple restore paths
- **Standalone** or **integrated** with Spectrum Protect



IBM Spectrum Protect Operations Center

A **web-application** that uses:

- A visual dialogue with administrators delivering decision point information necessary for successful use of the product
- Integrated wizards to expedite common tasks
- An integrated command-line to bridge from visibility to control
- Hub/Spoke model monitors multiple Spectrum Protect servers
- Replacement of Admin Center

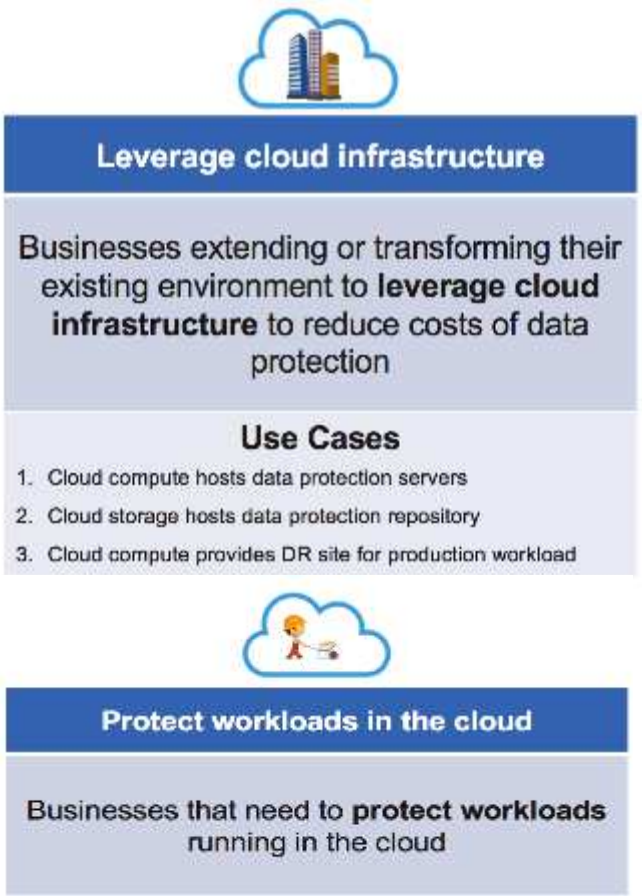
- IBM Spectrum Protect **Operation Center** can control :
  - Spectrum Protect server
  - The storage hierarchy
  - All Spectrum Protect clients

Benefits

- Visual dialogue with administrators providing decision point information necessary for successful use of Spectrum Protect
- At-a-glance view of data protection, from any browser enabled device

Since 2014 with Version 6.4

IBM Spectrum Protect and the CLOUD



- ✓ Spectrum Protect servers can use **object storage** as a backup target – 'to the cloud' (**Cloud containers**)
  - Bluemix (S3 and Swift), Amazon S3, OpenStack Swift, **IBM Cloud Object Storage**
  - **Inline deduplication + LZ4 compression (optional)**
- ✓ Spectrum Protect servers can be **hosted on cloud**
  - Bluemix, Amazon, Azure, Google
  - As Primary target – partners or clients can **leverage Frontsafe portal** to deliver Spectrum Protect 'as a Cloud' Service
  - As Replication target (**DR**) – partners or clients can host Spectrum Protect servers 'in the cloud'Spectrum Protect can **protect workloads running on cloud**
- ✓ Spectrum Protect can **protect workloads running on cloud**

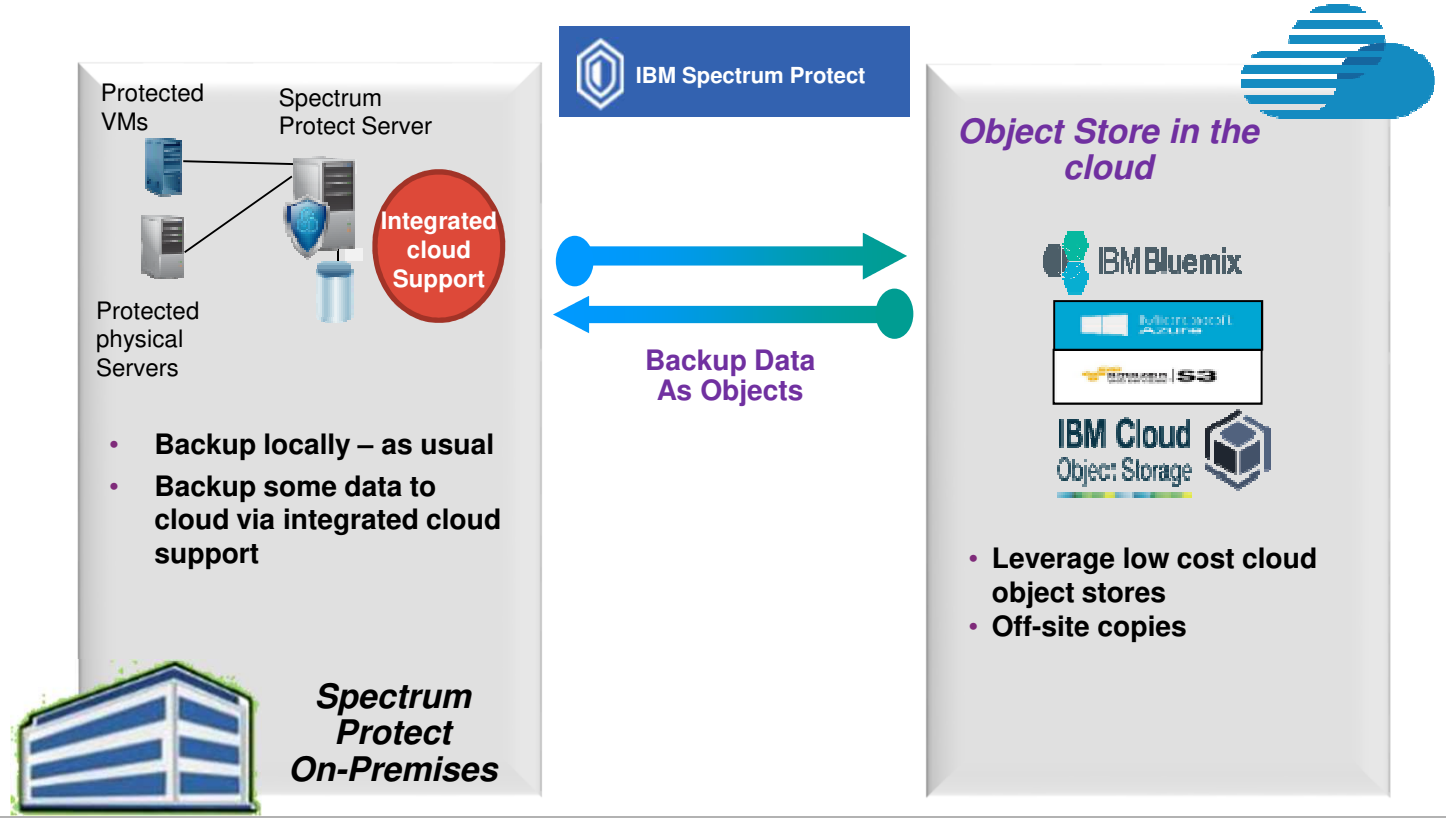
Spectrum Protect's Containers Storage Pools

A ***Container*** **Storage Pool** is a pool of one of the following types:

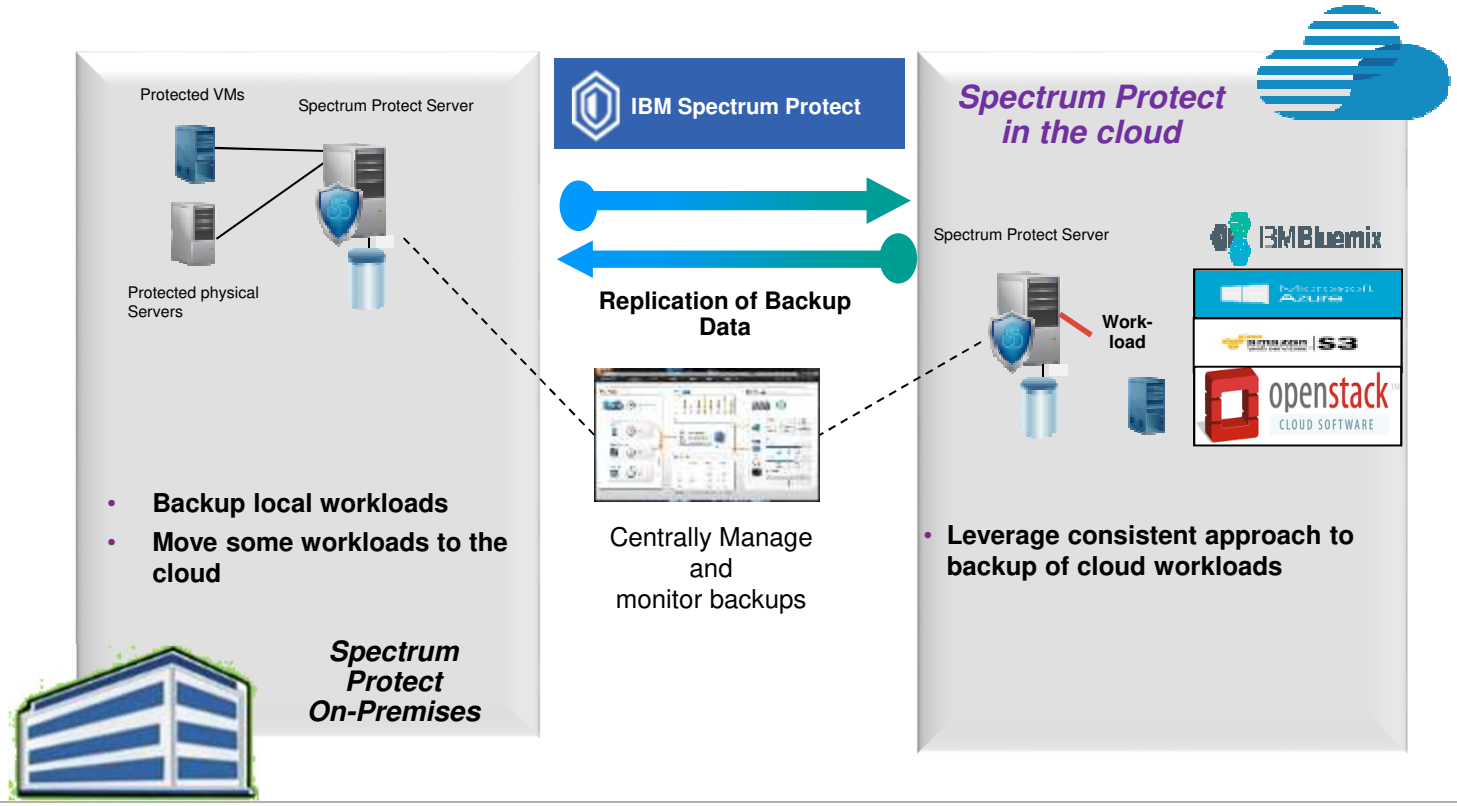
- ***Directory*** **Storage Pools**, which reside on disk, and have characteristics of Sequential FILE pools and random DISK pools:
  - Dynamic allocation and removal of files like Sequential FILE volumes
  - Re-usable space within a container like Random DISK volumes
  - More intelligent space utilization and I/O balancing across directories

- ***Cloud*** **Storage Pools**, which may be on- or off-premise (in the Cloud)

Spectrum Protect Backup to Cloud Storage
Cloud Containers



Cloud based DR for Spectrum Protect



Introducing **IBM Spectrum Protect Plus**

IBM
Spectrum
Protect Plus

The new data protection offering from IBM

Pre-announcement: August 23, 2017

First public viewing: VMworld US 2017

General Availability (GA): 4Q 2017

Primary use cases :

- Data Protection for **virtual machines**, applications
- Disaster Recovery
- Data Reuse
  - Test/Dev, DevOps, Reporting, Analytics, etc…

What Is **Spectrum Protect Plus** ?

Simplified Data Recovery and Data Access Solution for Virtual Environments

- **Simple** and light weight, **easy to deploy**, configure and manage
- Pre-defined **policy based service level**
- Secure, **self-service (**RBAC) administration
- Leverage your backup data for **new data reuse use cases**
- Data recovery and reuse **automation**
- Easily fits your budget

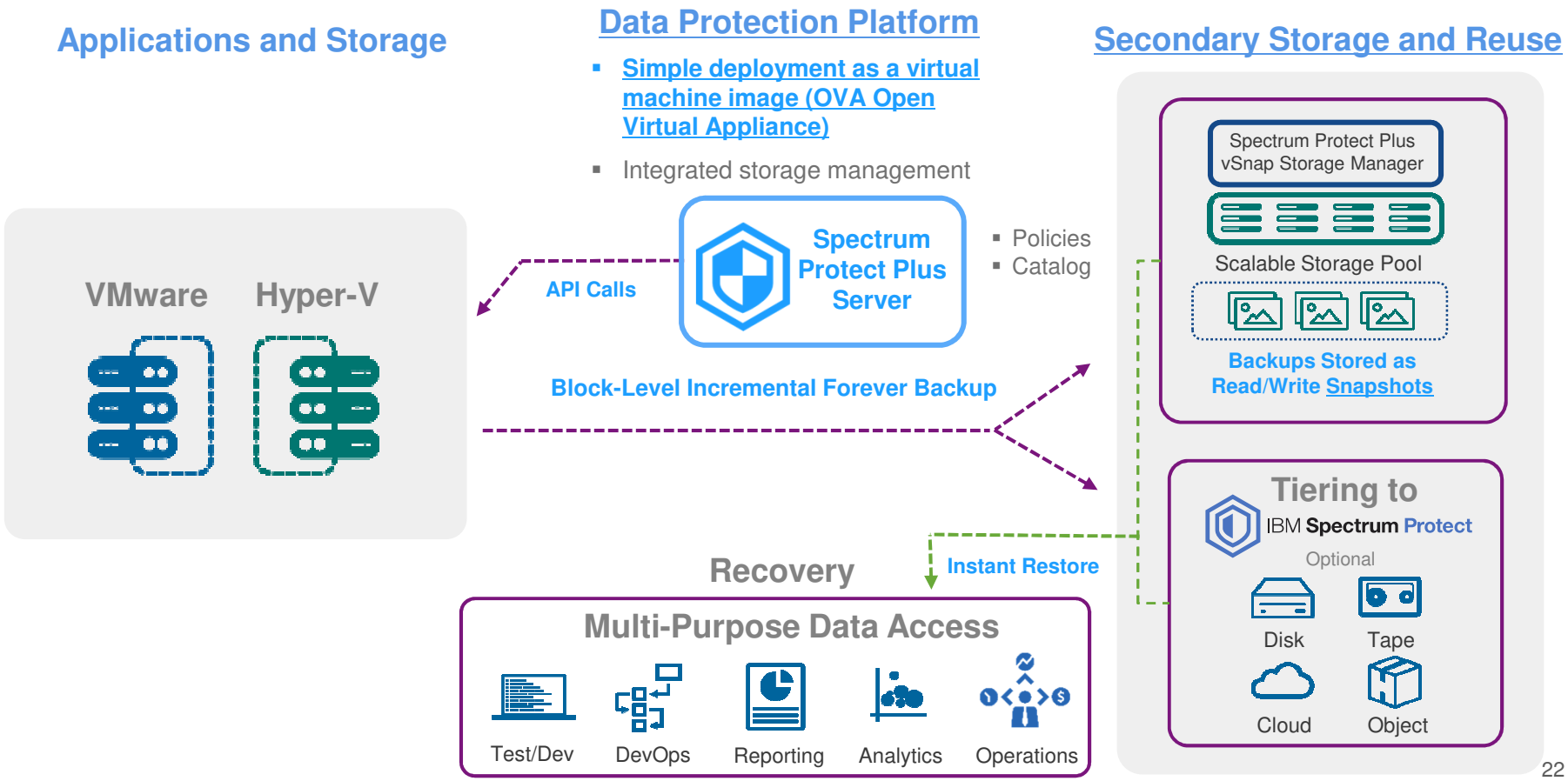
Modern

Easy

Fast

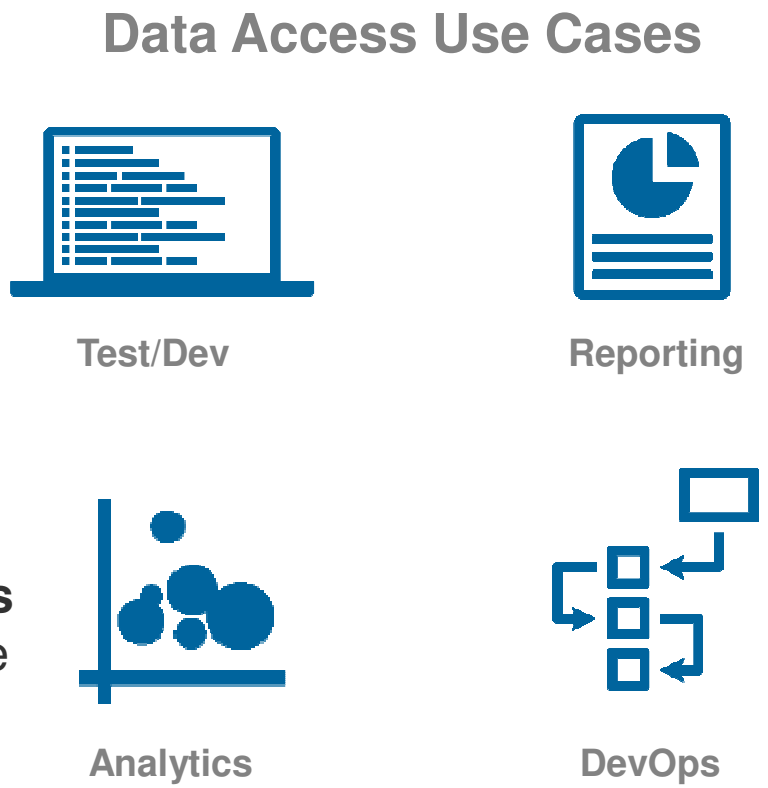
Low Cost

Spectrum Protect Plus Architecture



Multi-Use Data Access

- Spectrum Protect Plus is **not just backup**, it's a **snapshot management system**, which covers anything you could snapshot – VMs, Arrays, Apps and has data protection, snapshot and CDM functions.
- Derive business value from your protected data
- **Spin up VMs** and **VMDKs** (Virtual Machine Disk File) by **Read/Write Clones** for easy & secure data access for multiple use cases.



6 Key Spectrum Protect Plus Attributes

SLA policy-based data protection

- Gold, Silver, Bronze pre-configured
- Custom policy creation as needed

Instant data recovery or data access

- Support for multiple use cases: Test/Dev, DevOps, reporting, analytics, training, etc.
- Roles-based access; **user self-service**

Simple to use, anyone can manage

- **VM**, **database** or **application** admin
- Light weight: **Installs in less than 15 minutes, configured in under an hour**

Extends the capabilities of Spectrum Protect for virtual environments

- **Stand alone** – great for small environments
- **Integrated with Spectrum Protect** for long term data retention

Global search and restore

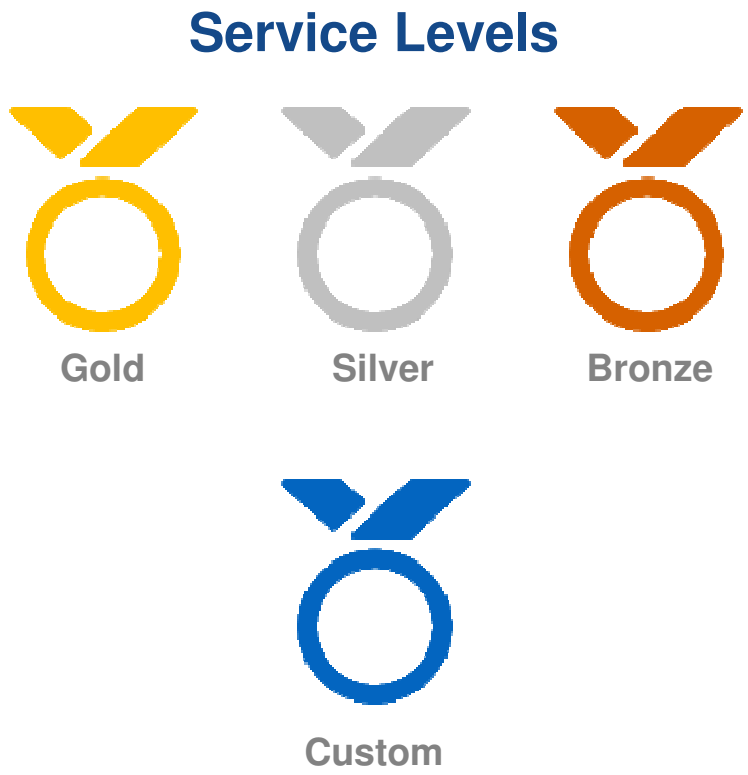
- Search across all virtual machine data at once (VMware and Hyper-V)
- Restore from search: **files, VMs, VMDKs**

Exploits VM and application API's

- Creates **application consistent** or **crash consistent** data copies
- Supporting further data reduction with **compression** and **de-duplication**

Policy Driven, **SLA**-Based Automation

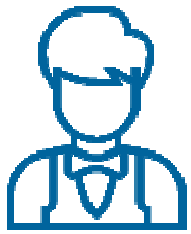
- Select, click and done simplicity
- **SLAs pre-defined** or **create-your-own**
- Select a VM and assign an SLA to define its **recovery service**
- Unprotected VMs identified in dashboard view
- Set it and forget it



Simple, Secure SLA Based **Self-Service** Management

- Easily assign functionality based on **user roles** (Backup admin, Storage admin, VM admin, Help Desk User, ..)
- Assign one or multiple roles to each user
- Reduces load on IT staff
- End-users prefer **self-service models**
- Safe and secure access

Backup Admin



VM Admin

Developer

Help Desk

Global Search and Recover

- Unified, **Google-like search** across files and objects **across the entire protected environment** and not within a single machine.
- Search across VMware and Hyper-V in a single operation
- Locate **files, VMs, datastores**
- Easy restore from search

Instant Data and VM Recovery

- **Recover rapidly from snapshot copies**
- Suitable for all recovery use cases
- **Multiple recovery points** for all VMs
- No waiting for streaming restores : backups accessible as soon as snapshot is mounted
- Application or crash consistent backups, recovery, cloning

Data Loss Scenarios

Ransomware

Human Error

Hardware Failure

Data Corruption

Long-term Retention Using Spectrum Protect

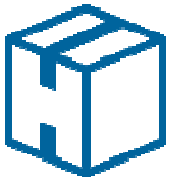
- Automated copy transfer to **Spectrum Protect***
- Long-term retention / tier to **cloud**
- Single-step recovery
- Meets legal and regulatory compliance needs

Retention Options

Disk

Tape

Cloud



Object Store

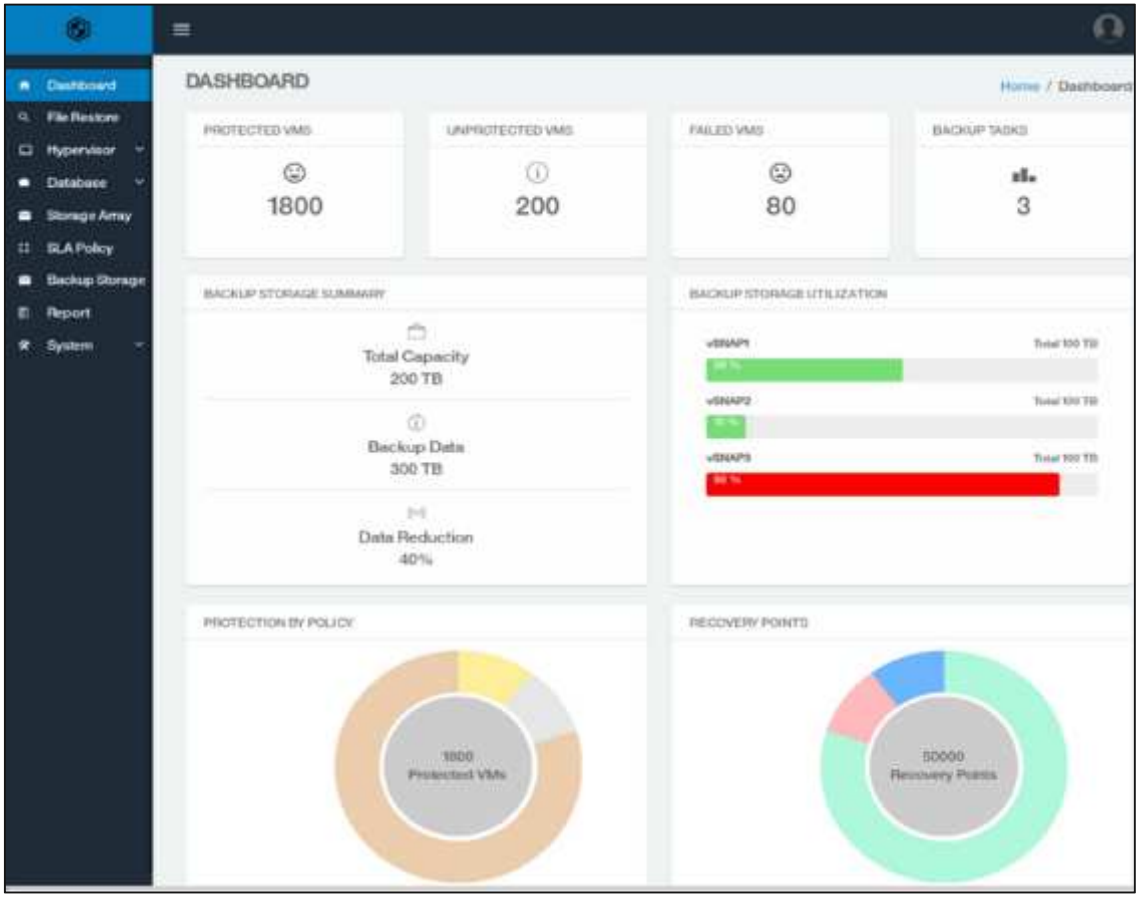
* Need to be running **Spectrum Protect 8.1** or better

Dashboard and Reporting

At-a-glance status

Drill-down data on:

- Protection status
- SLA compliance
- Storage utilization
- VM sprawl



Competition

Caractéristiques	Protect Plus	Veeam	Comm-vault	Veritas	Dell EMC
Simple à installer et à configurer	✓	En partie	✗	✗	En partie
Simple à utiliser (par non spécialiste backup)	✓	✓	✗	✗	✗
Accès à la données sécurisé	✓	✗	✗	✗	✗
Politique basée sur des SLA	✓	✗	✗	✗	✗
Support Cloud / Stockage Objet	/ Protect	✓	✓	✓	En partie
Moteur de recherche global	✓	✗	En partie	En partie	✗
Automatisation de l'accès à la donnée	✓	✓	✗	En partie	En partie
Sauvegarde Serveurs Physiques	/ Protect	✓	✓	✓	✓

Spectrum Protect Plus vs Veeam 9.5/10

IBM
Spectrum
Protect Plus

- Veeam is based on Windows OS only, not secure as Linux
- **Extreme ease of install**, <15min time to value
- Inexpensive **Fully Featured Licenses** :
  - **Trial** fully functional up to 90 days
  - **Freemium** fully functional for 10VMs
- Delivered as a Virtual Appliance based on Linux **with no licence need**
  - No OS costs like Windows licences with Veeam !
- Simple Active/Passive failover cluster configuration
- Self-Repairing Datastore as standard
- Global File Indexing
- Advanced Copy Data Management

VEEAM

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Conclusion

- **Simplicité**: Installation, Configuration, Utilisation
- Deux services : Protection de la donnée & Accès à la donnée
- Puissant **moteur de recherche global** : VM / VMDK / Fichiers ➔ Restauration
- **Utilisation des API de sauvegarde** VMware (CBT) / Hyper-V (RCT)

  ➔ performances sauvegarde et optimisation stockage
- Sécurité d'accès à la donnée (Rôle + ID / PW)
- Une interface d'administration & d'exploitation simple et conviviale
- Support du Cloud via Spectrum Protect

IBM Spectrum Protect Plus
live Demonstration

IBM Spectrum Protect Plus
Live Demonstration

This demonstration are available on **IBM Client Demonstration Center :**

- https://www.ibm.com/systems/clientcenterdemonstrations/

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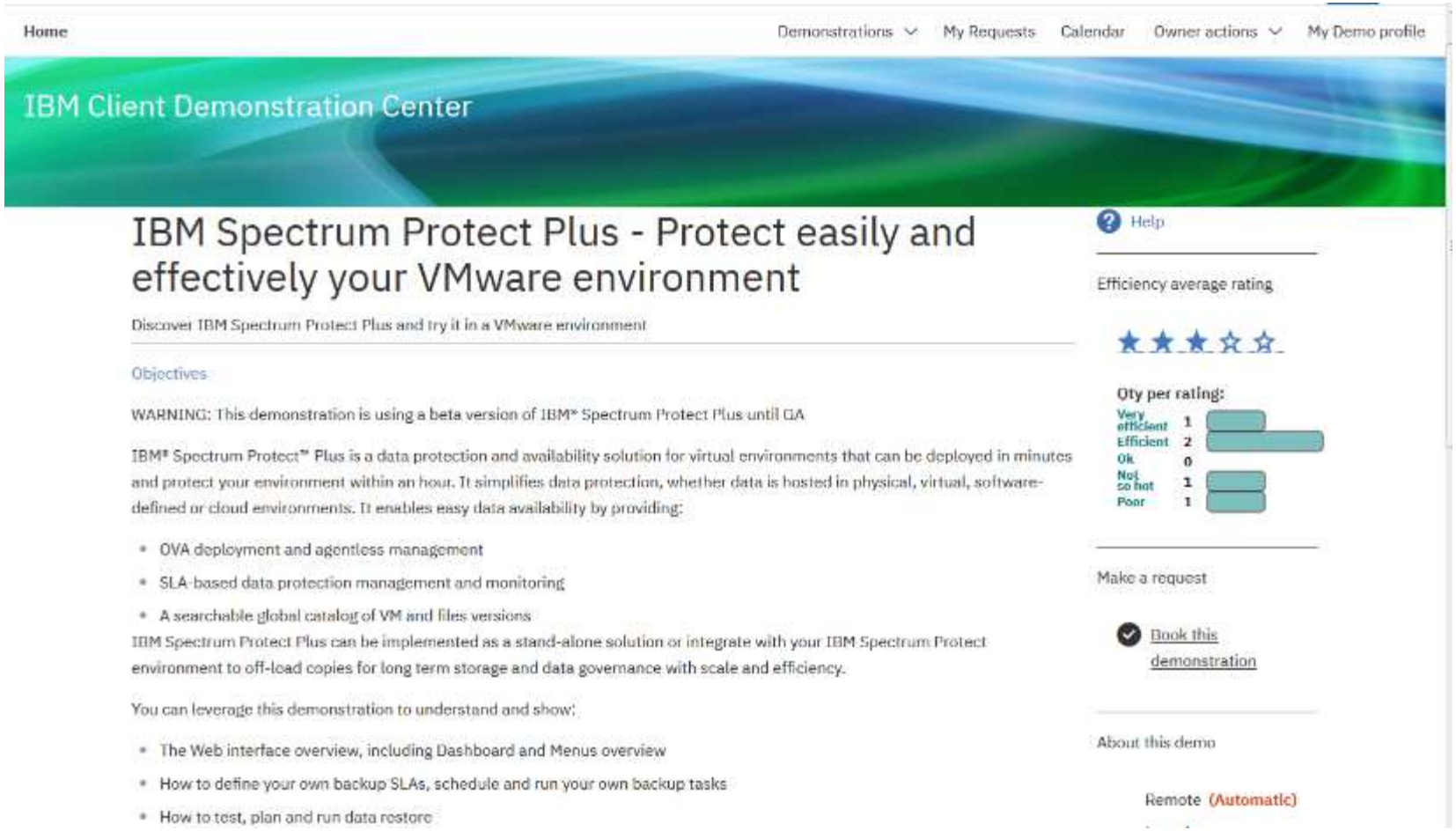
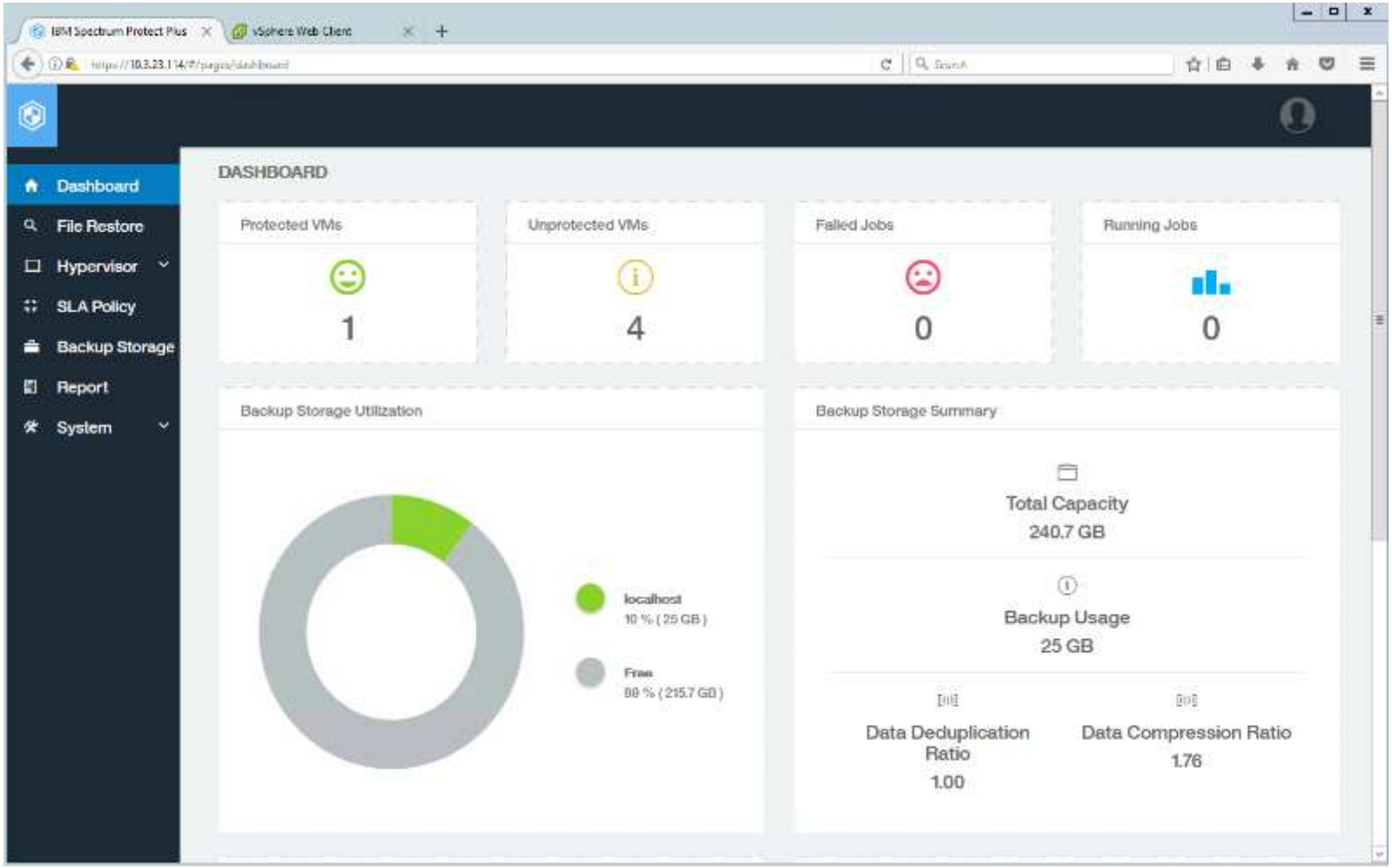
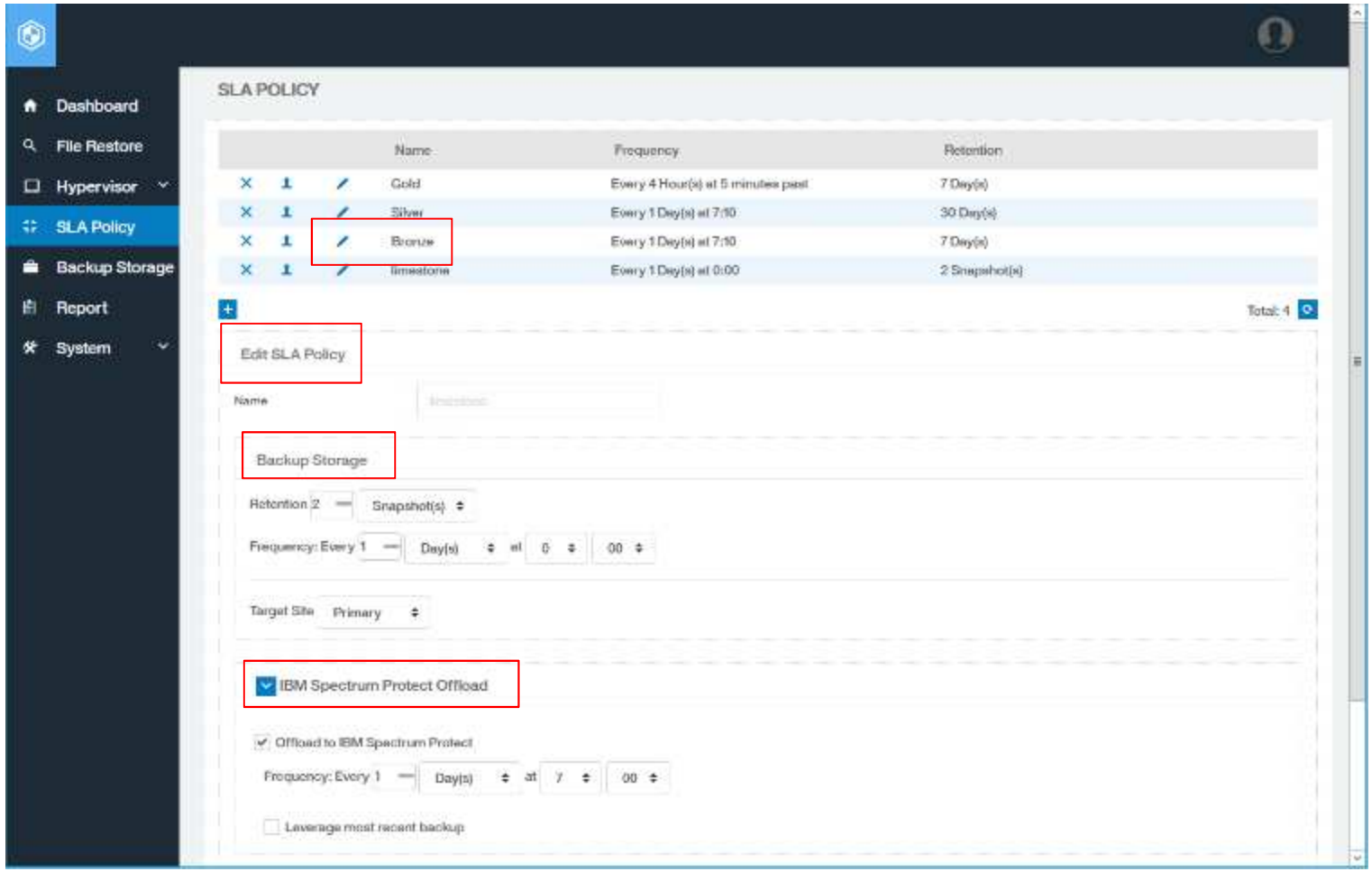
https://www.ibm.com/systems/clientcenterdemonstrations/faces/_rlvid.jsp?_rap=!viewDemo&demoId=2760&conversationContext=1&_rvip=/dcSearchDemonstrations.jsp



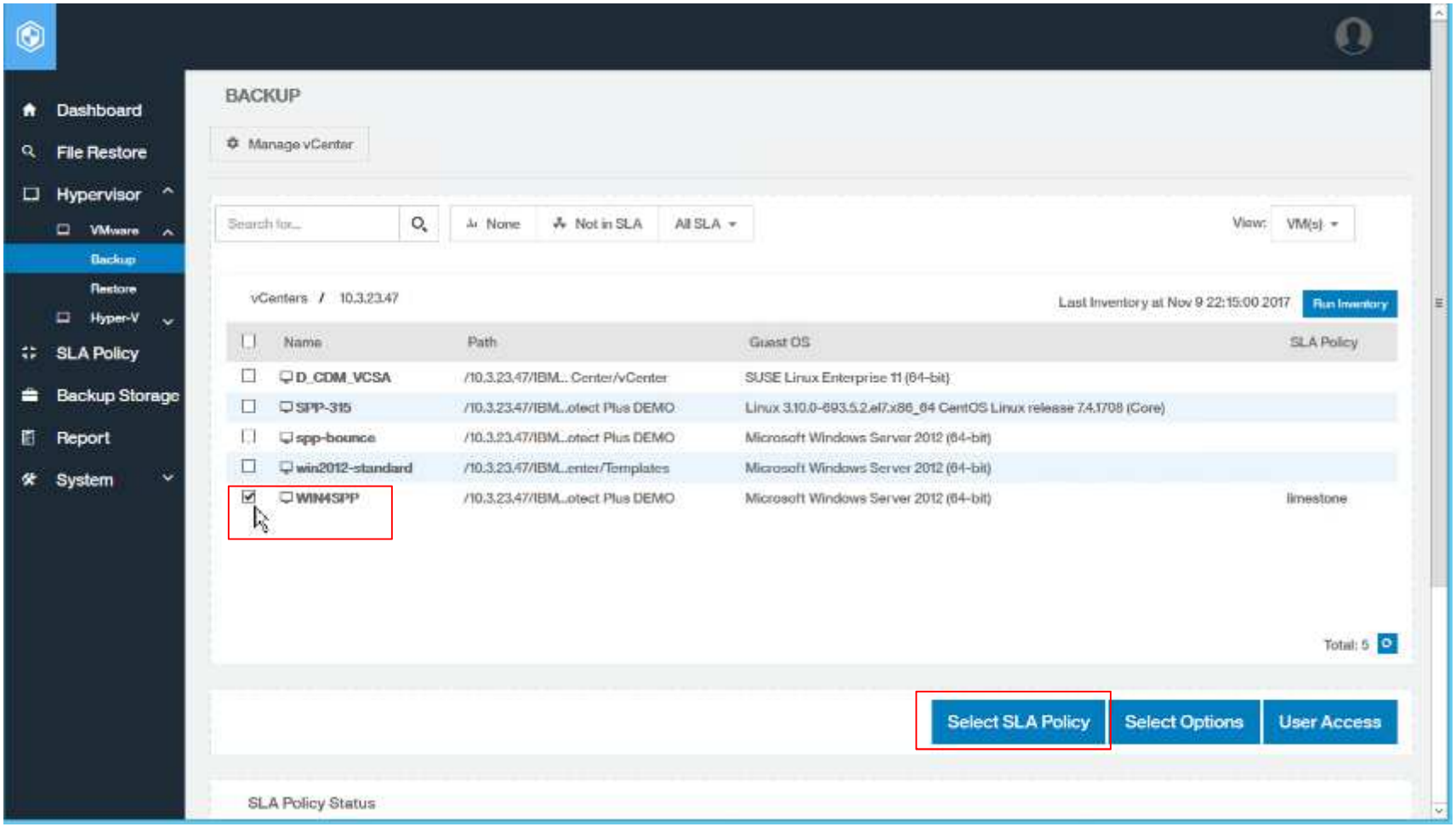
IBM Spectrum Protect Plus **: Dashboard**



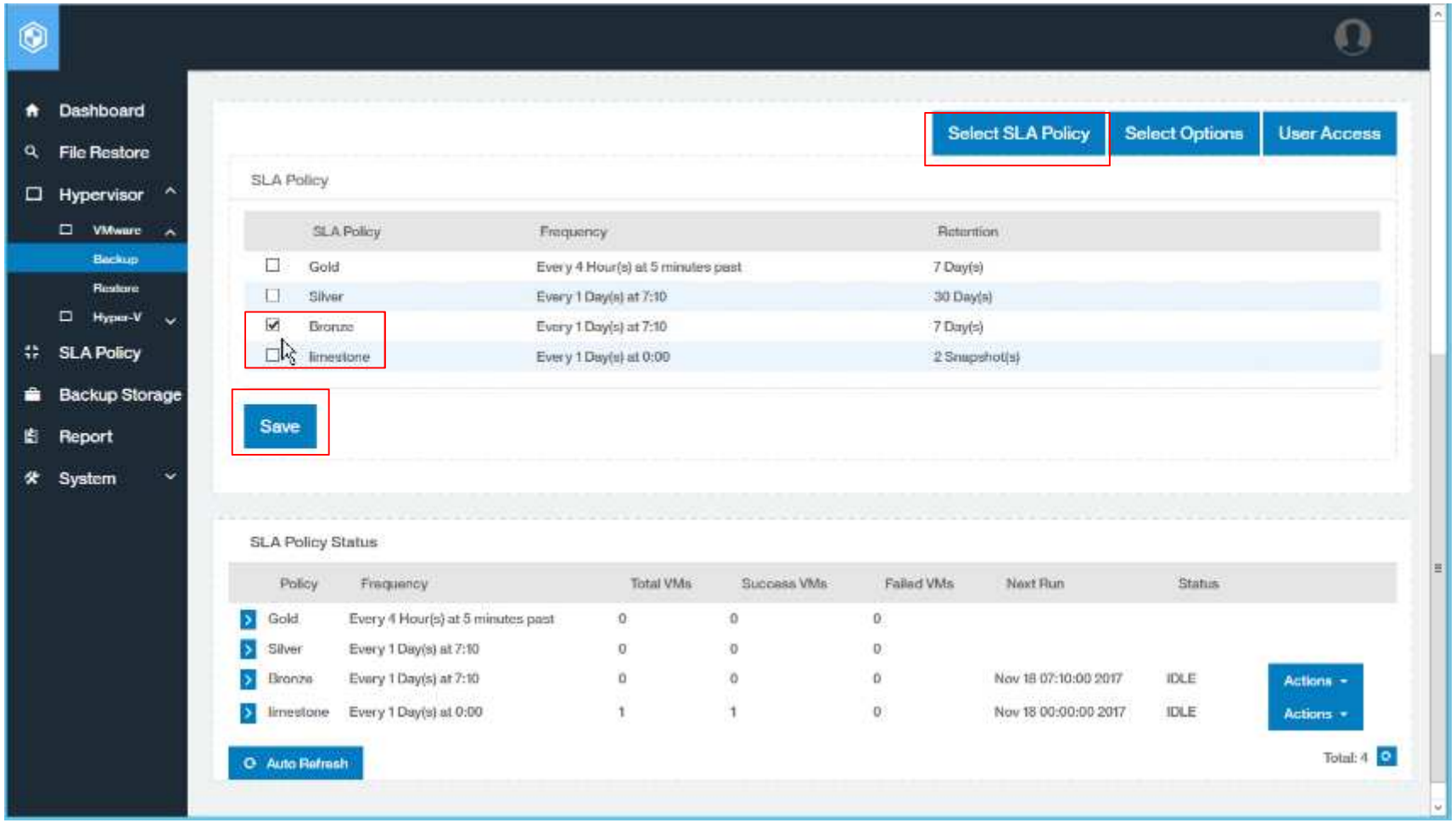
IBM Spectrum Protect Plus : **SLA Policies**



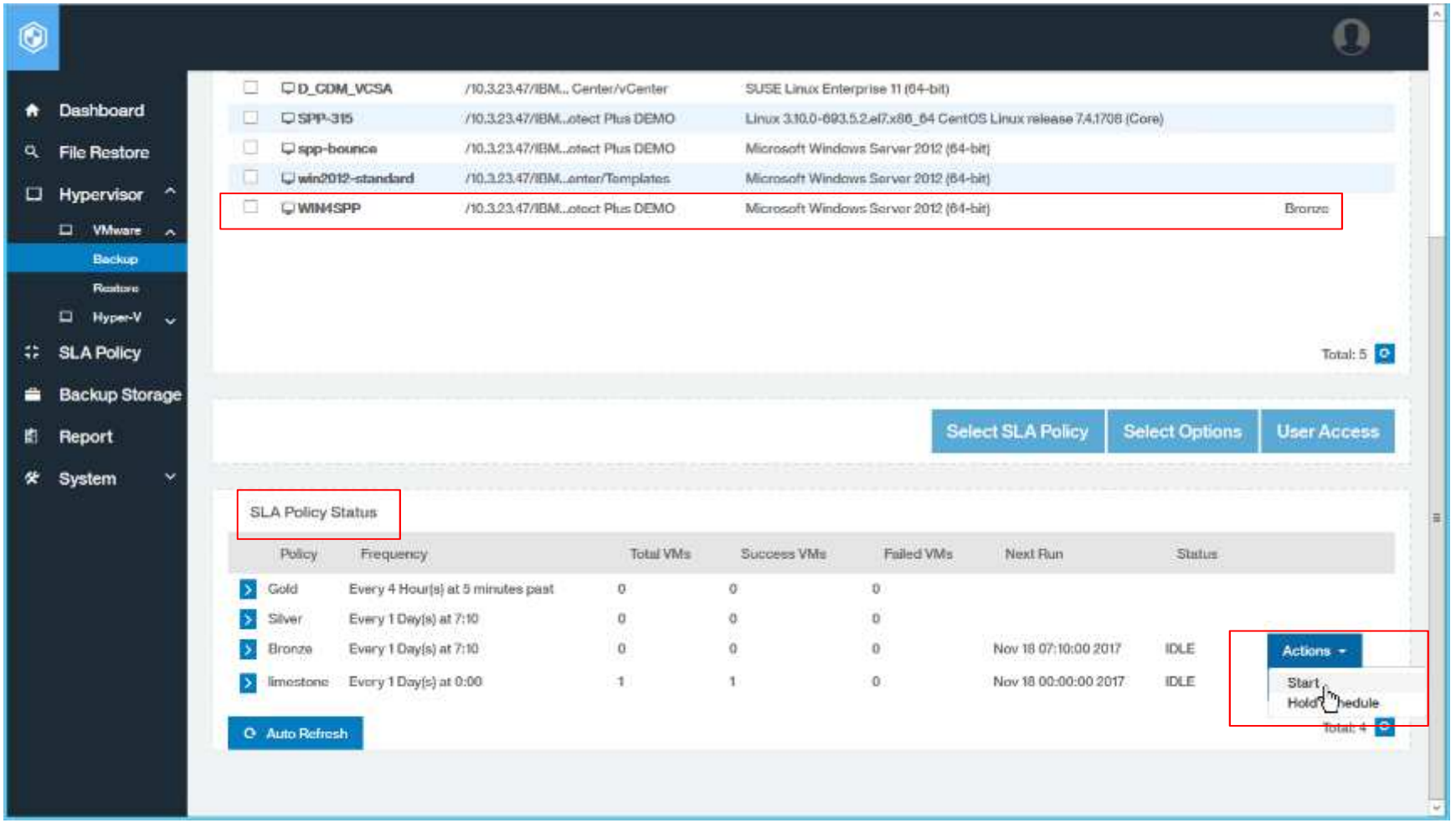
IBM Spectrum Protect Plus : **Backup a VMware VM**



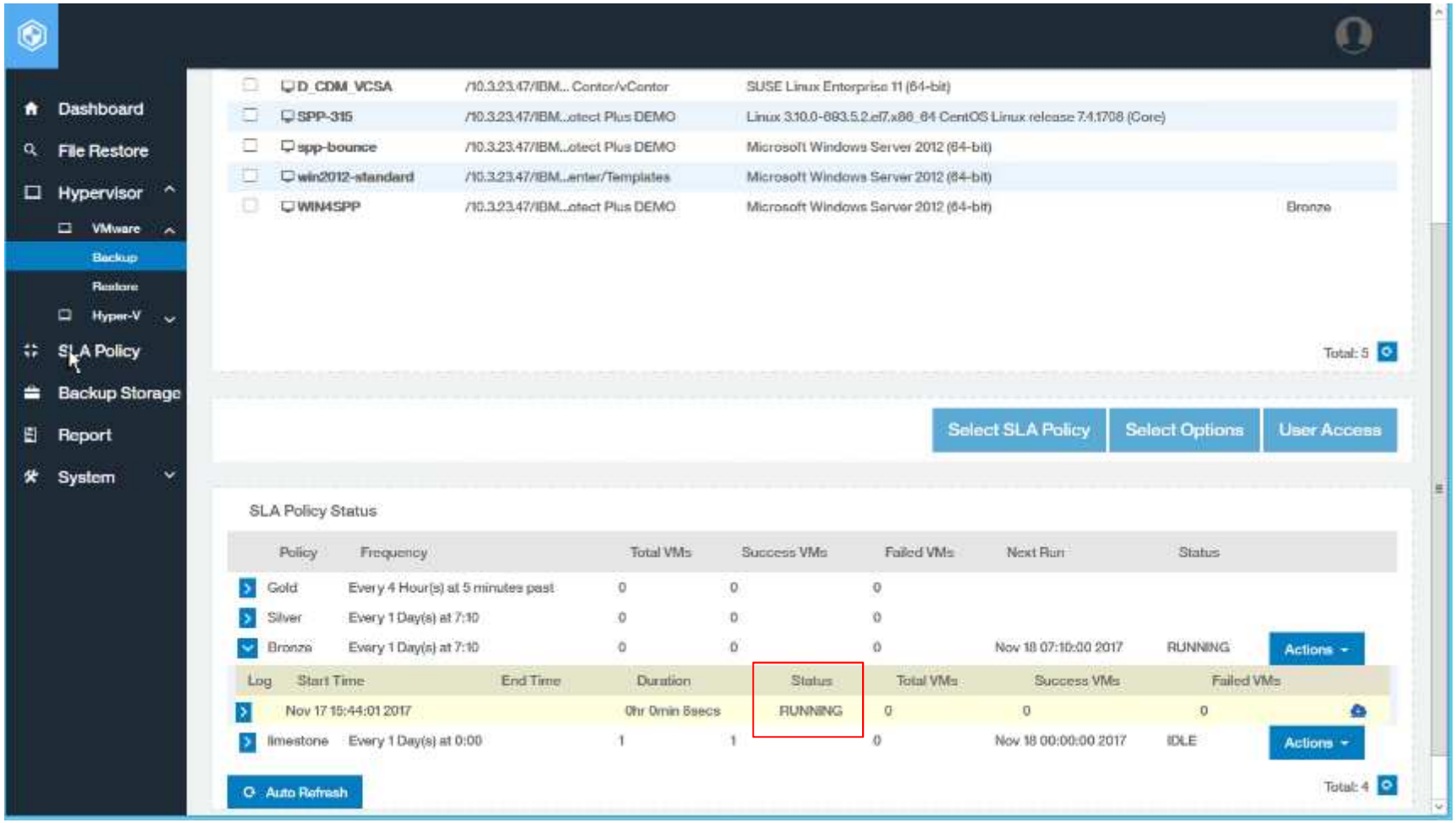
IBM Spectrum Protect Plus **: Backup a VMware VM : Select the Policy**



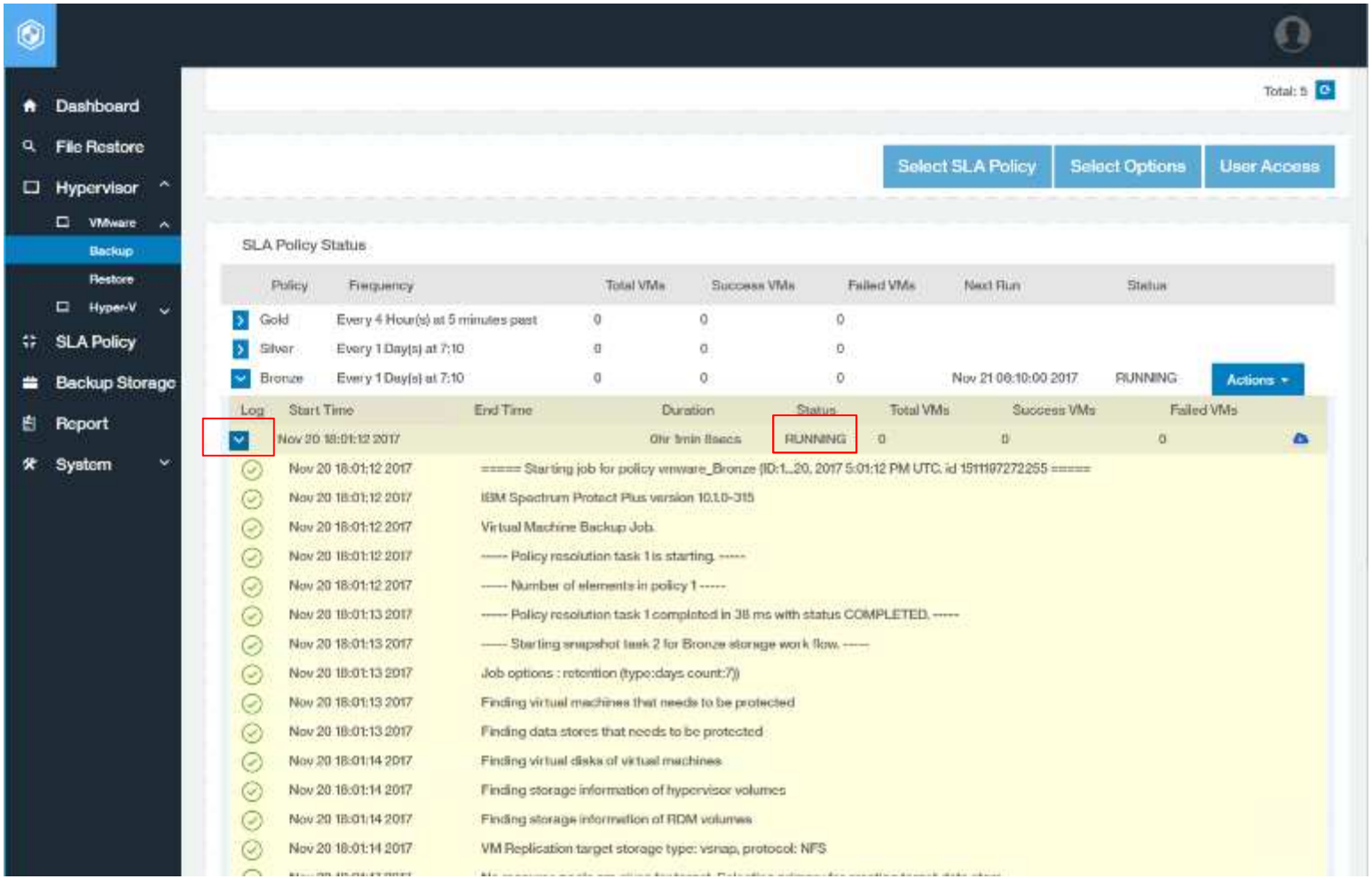
IBM Spectrum Protect Plus **: Backup a VMware VM : force a backup**



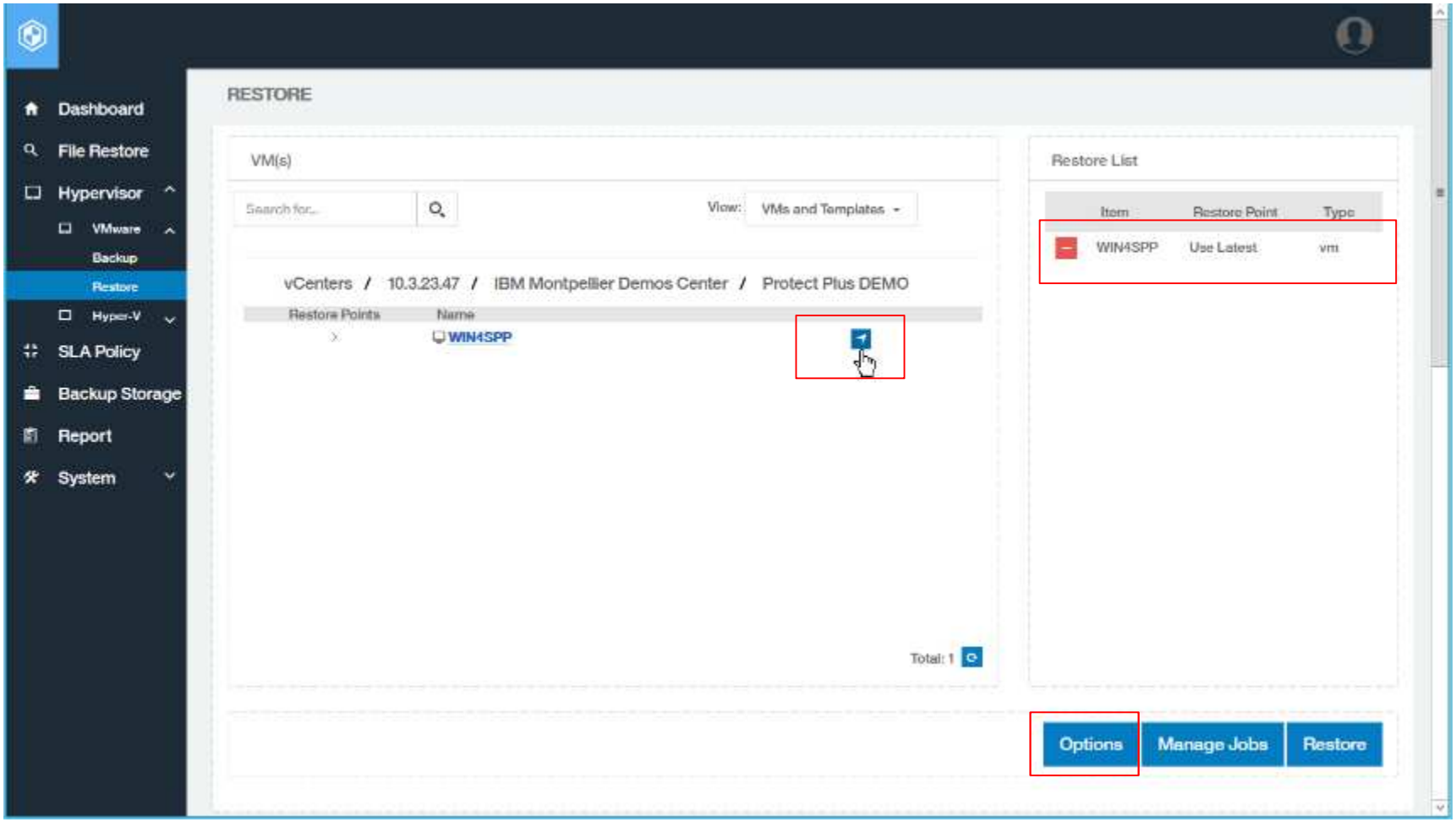
IBM Spectrum Protect Plus **: Backup a VMware VM : Backup running**



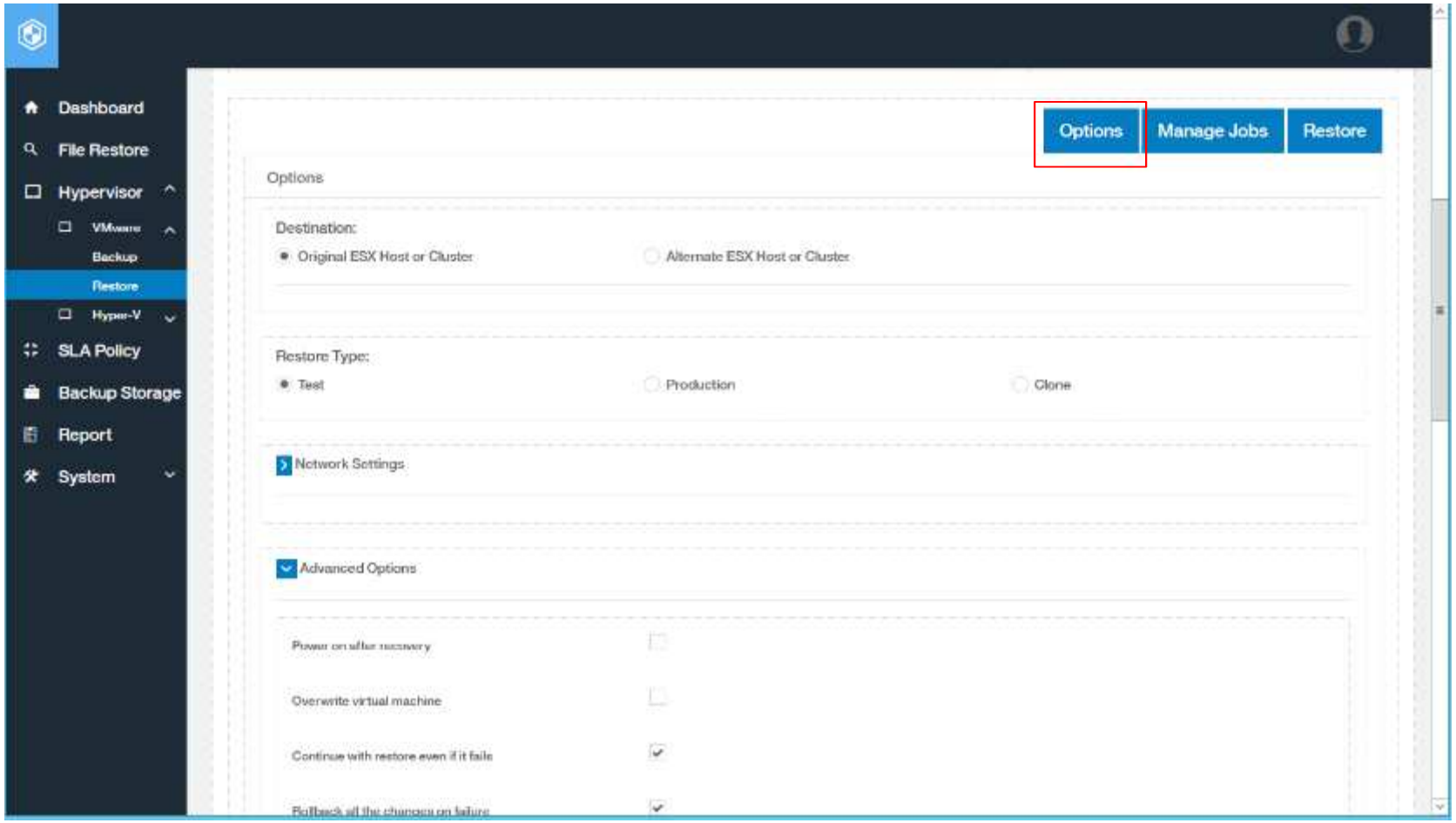
IBM Spectrum Protect Plus **: Backup a VMware VM : Backup running**



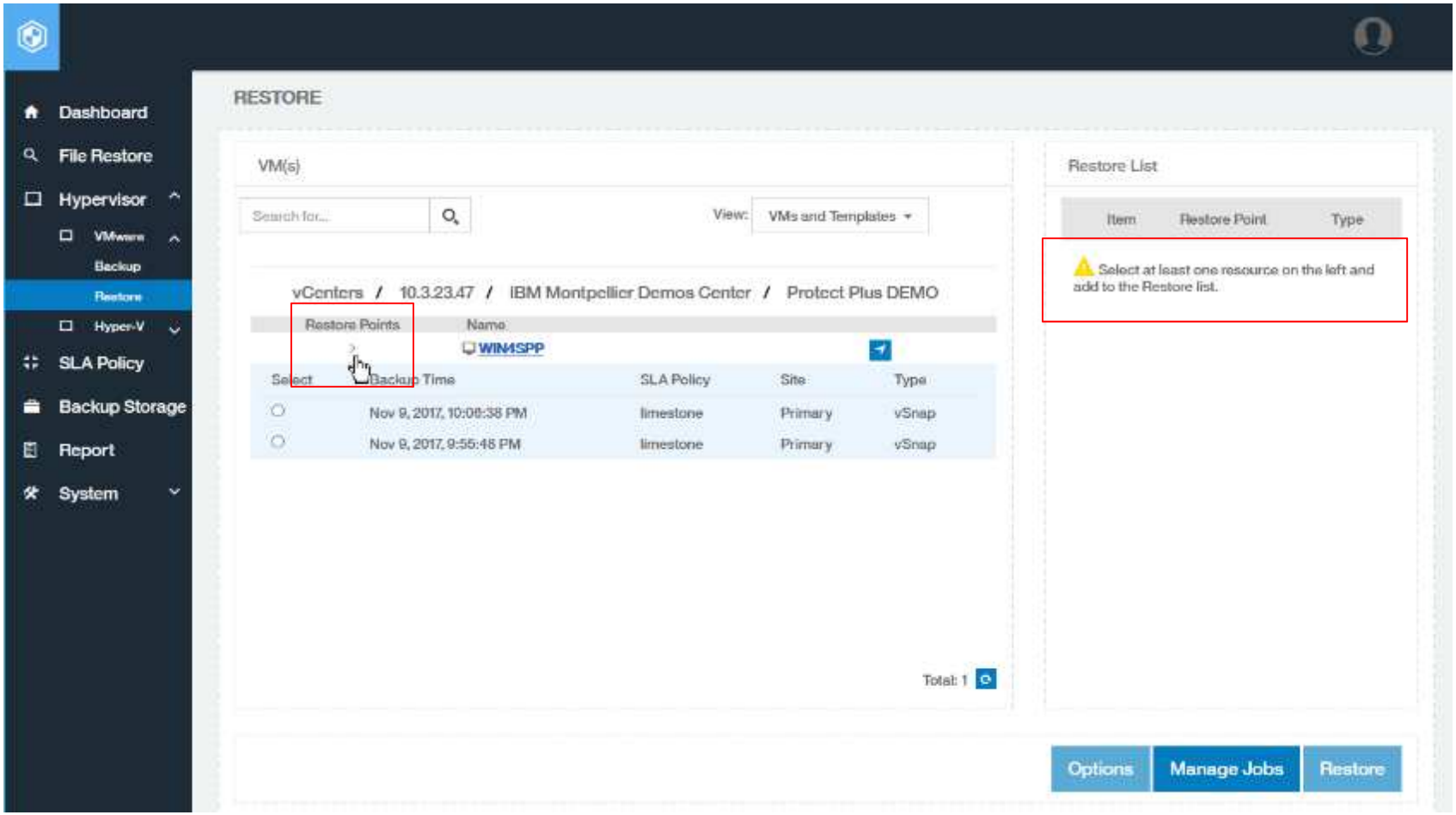
IBM Spectrum Protect Plus **: <u>Restore a VM</u>**



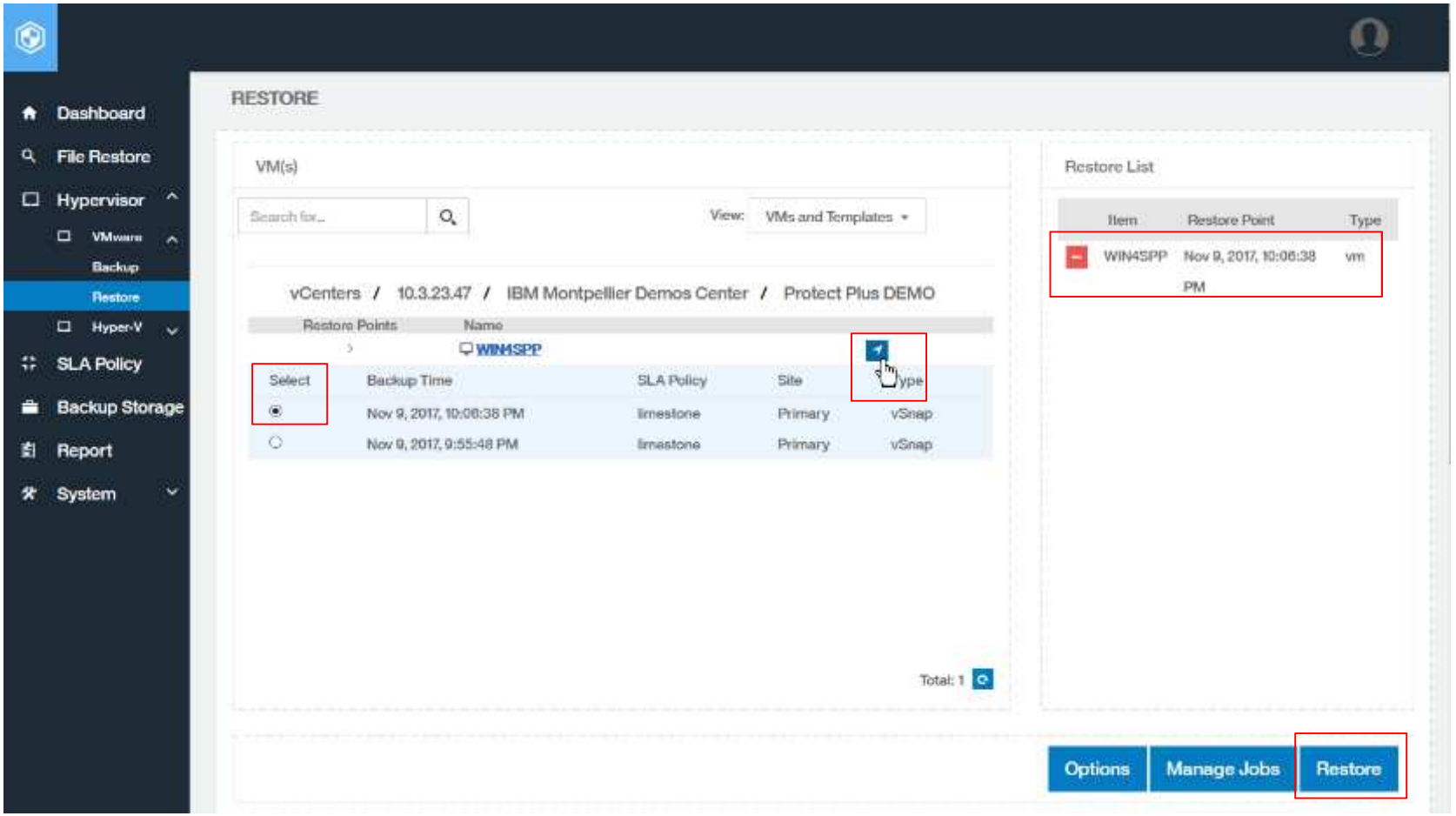
IBM Spectrum Protect Plus **: Restore Options**



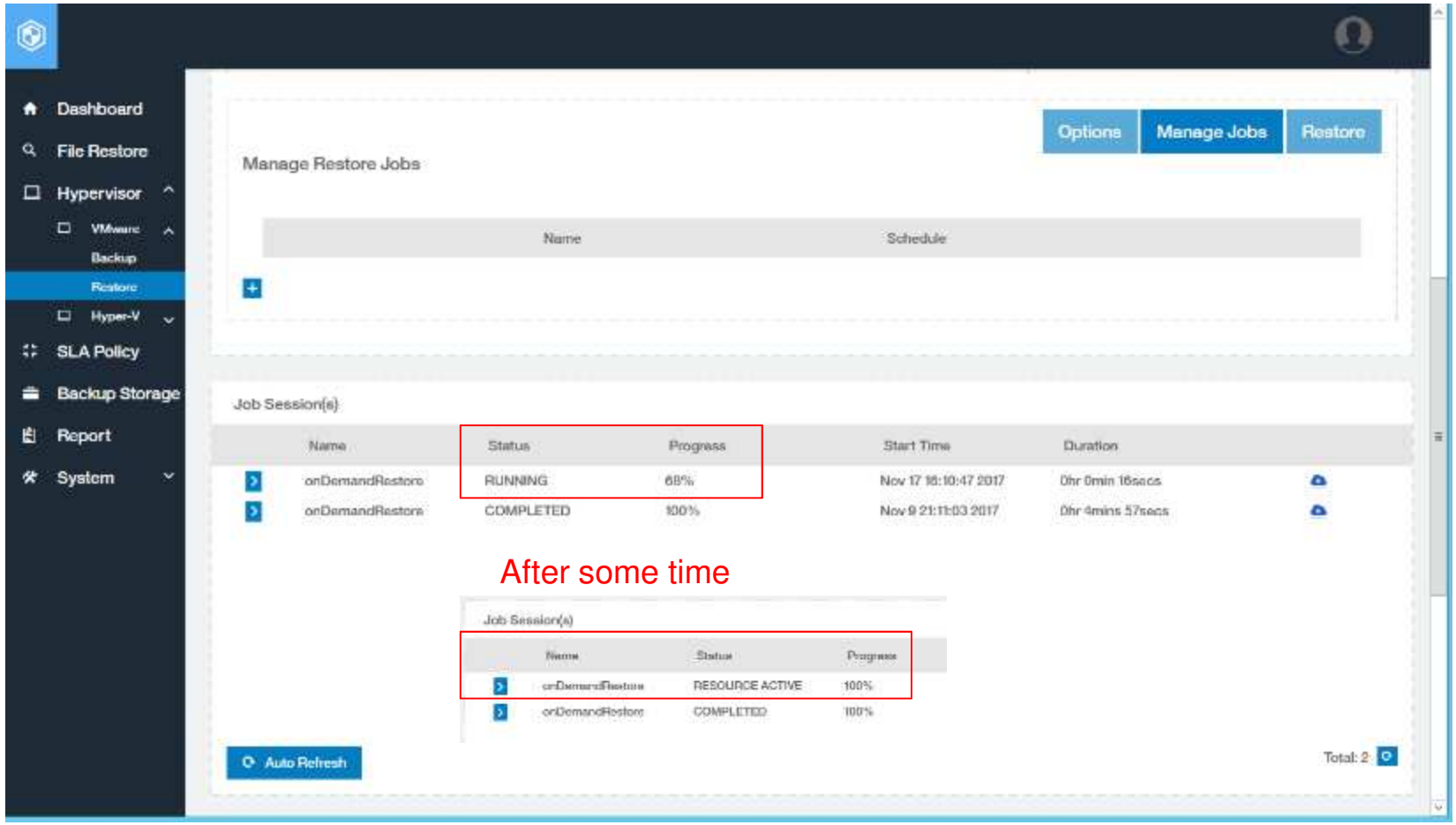
IBM Spectrum Protect Plus **: Start Restore**



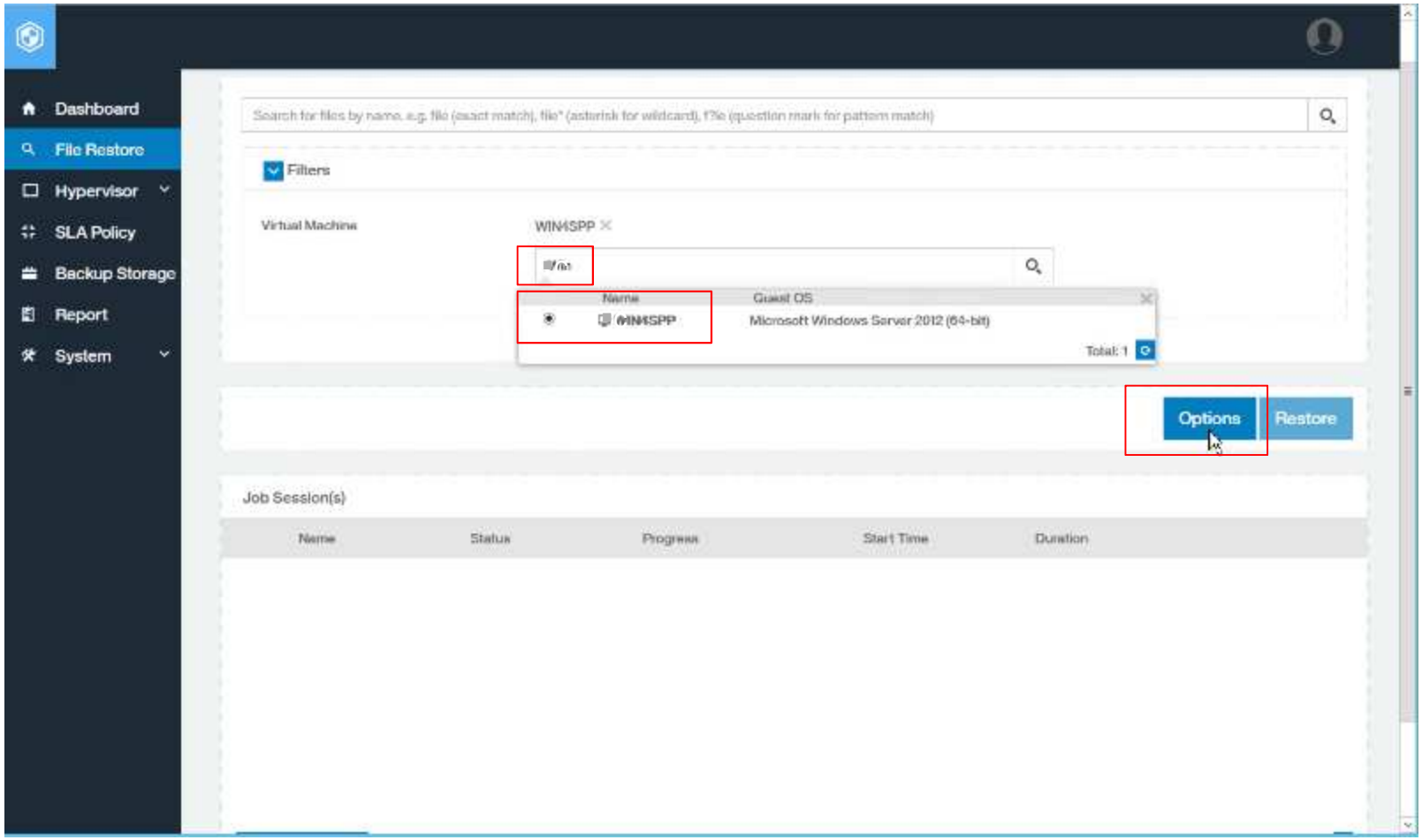
IBM Spectrum Protect Plus **: Start Restore**



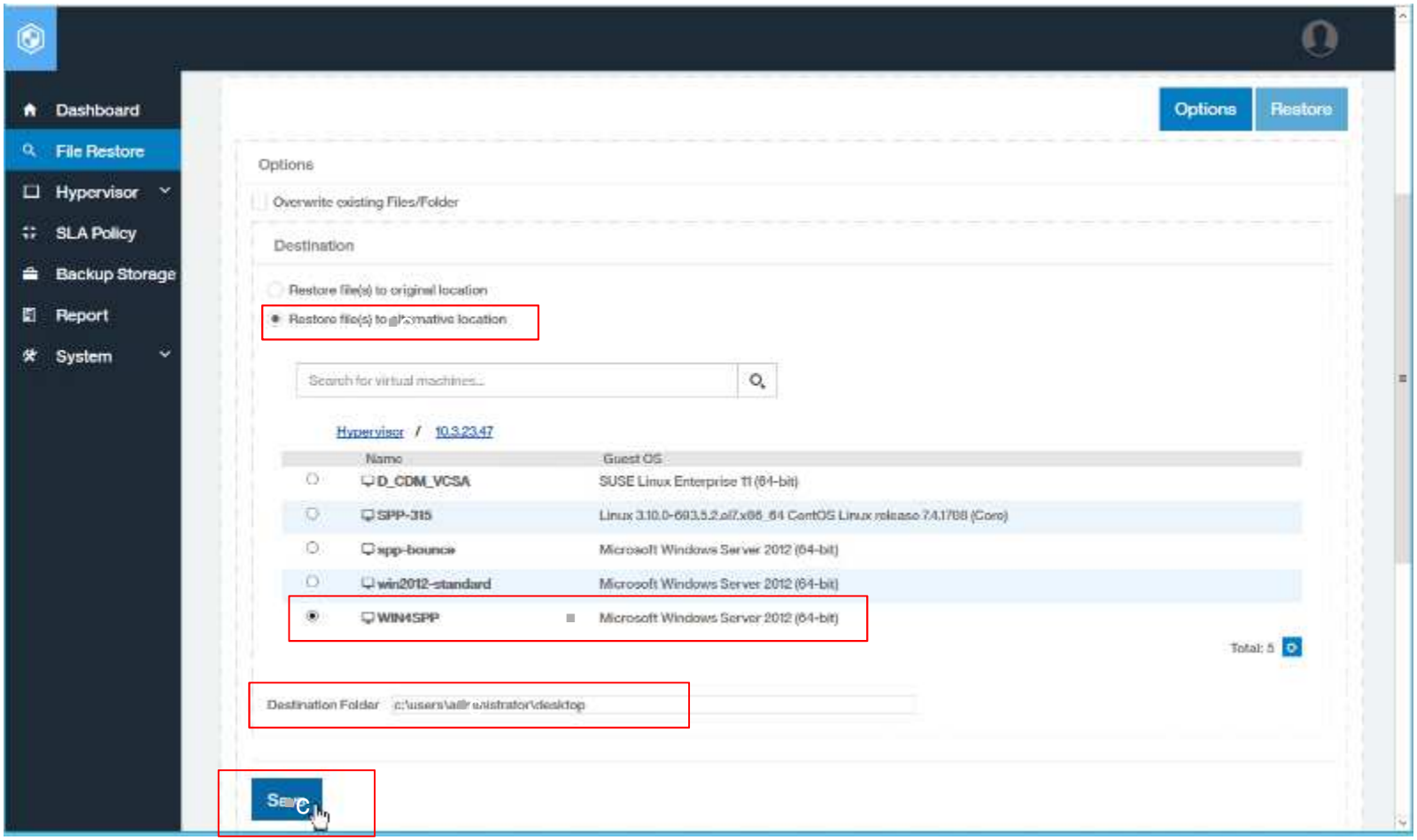
IBM Spectrum Protect Plus **: Restore**



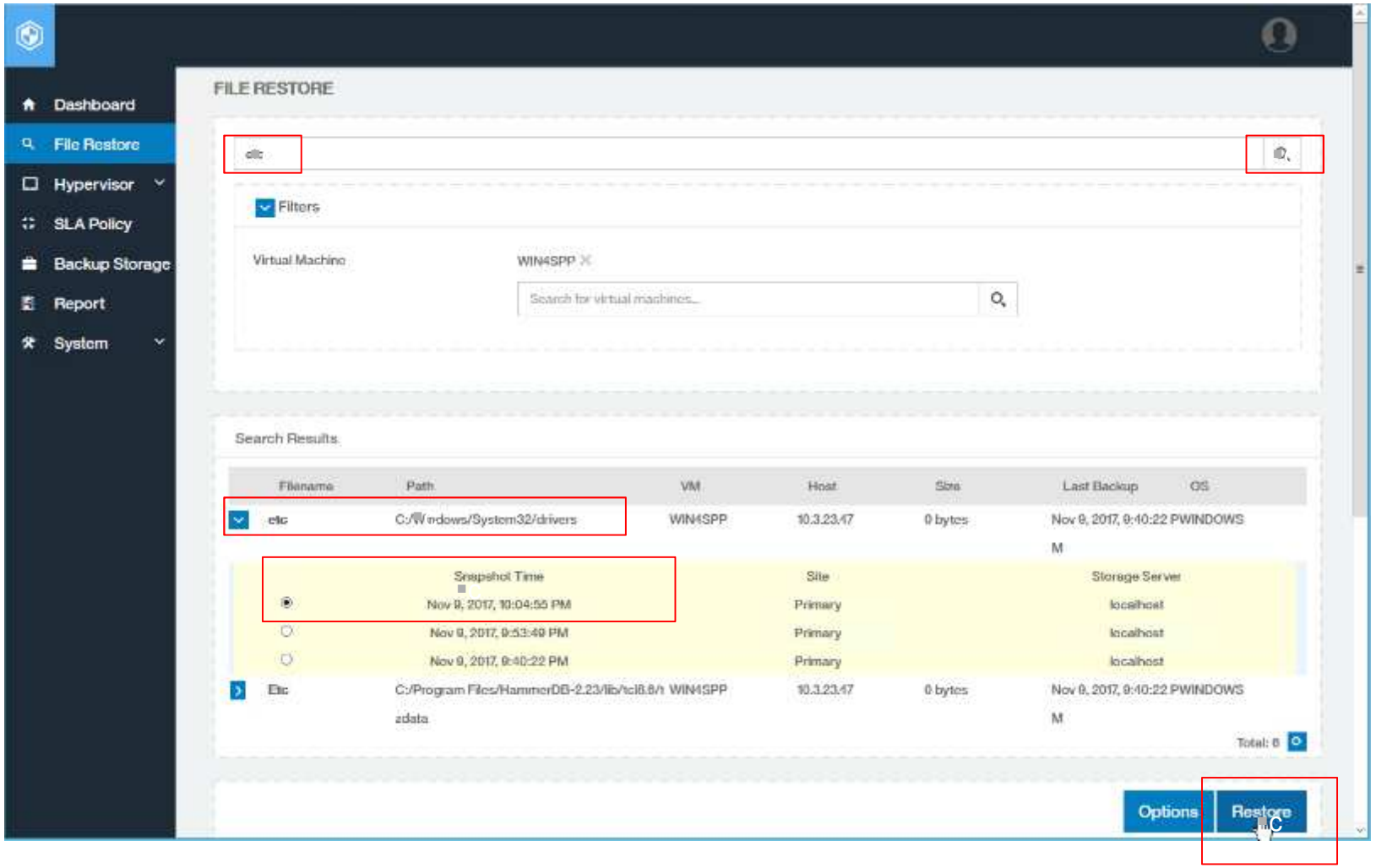
IBM Spectrum Protect Plus **: <u>File Restore</u> : Search for specific VM**



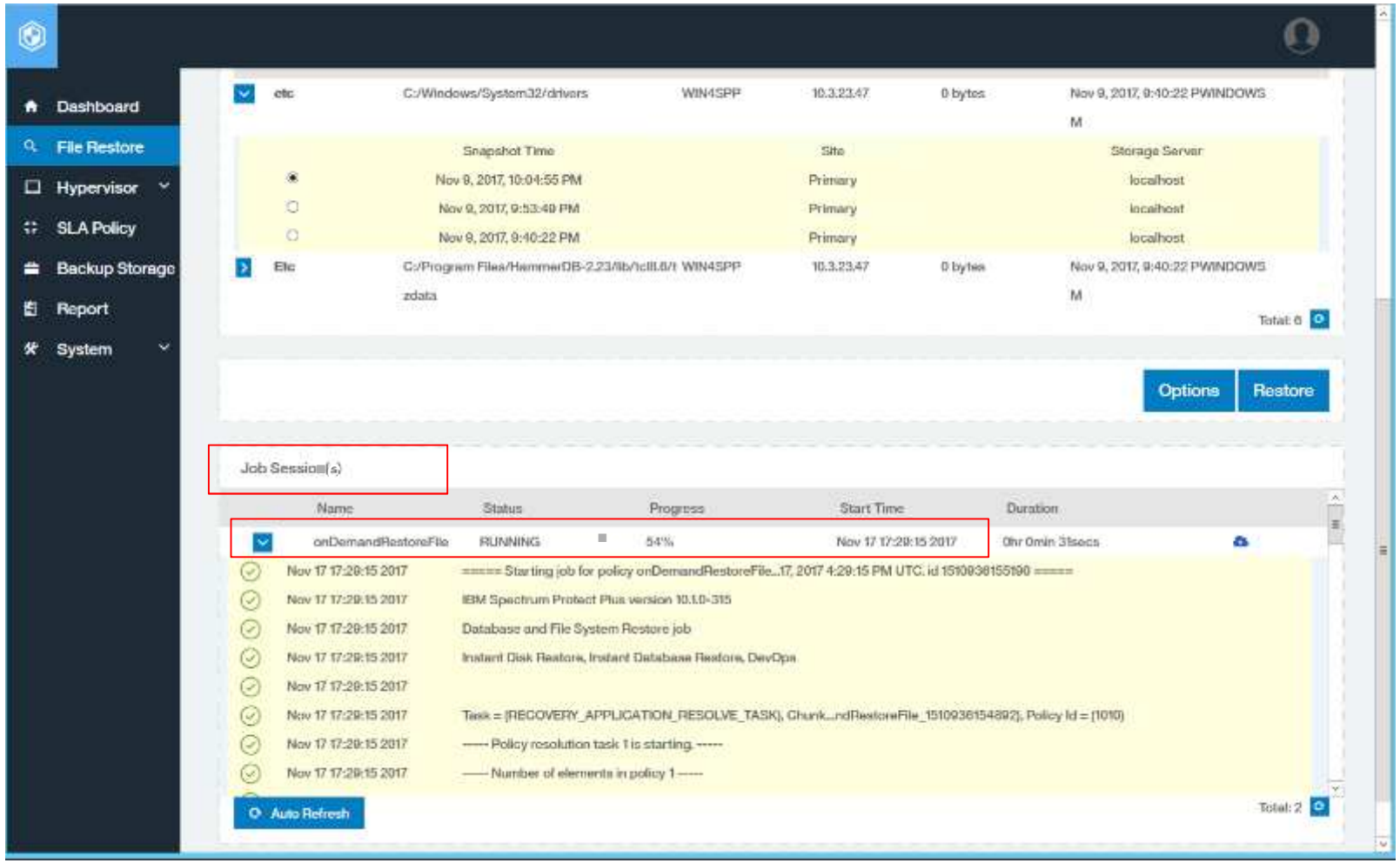
IBM Spectrum Protect Plus **: File Restore : Select destination**



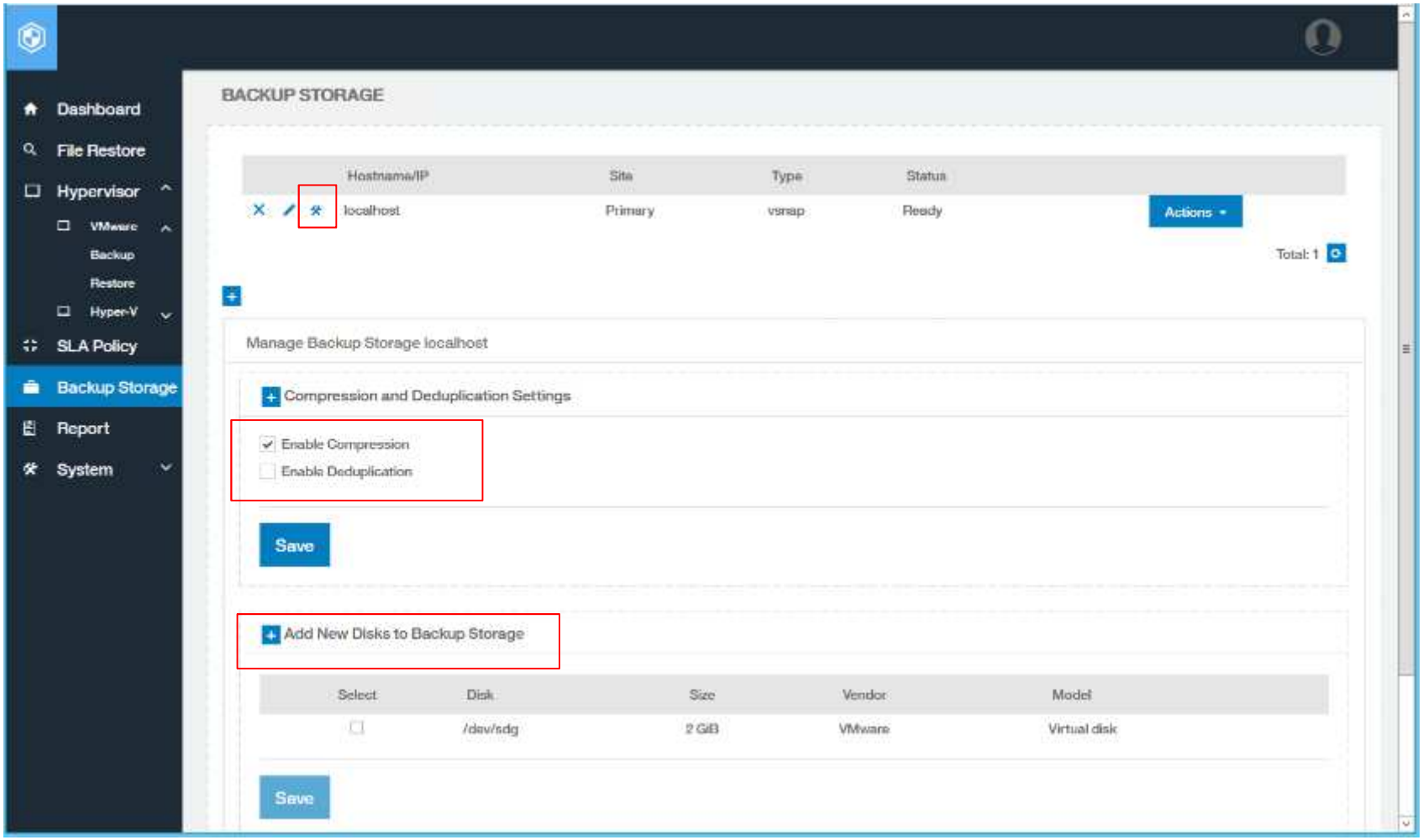
IBM Spectrum Protect Plus **: File Restore : Select File to restore & Snapshot**



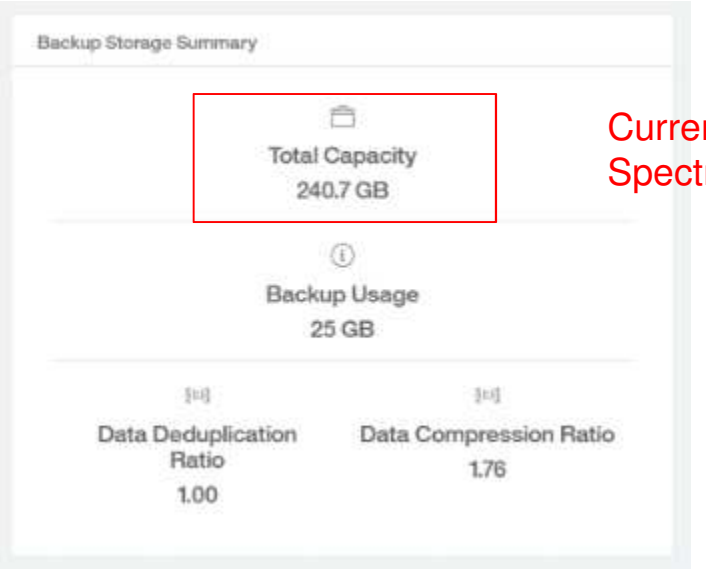
IBM Spectrum Protect Plus **: File Restore : Job progression**



IBM Spectrum Protect Plus **: <u>Backup Storage configuration</u>**

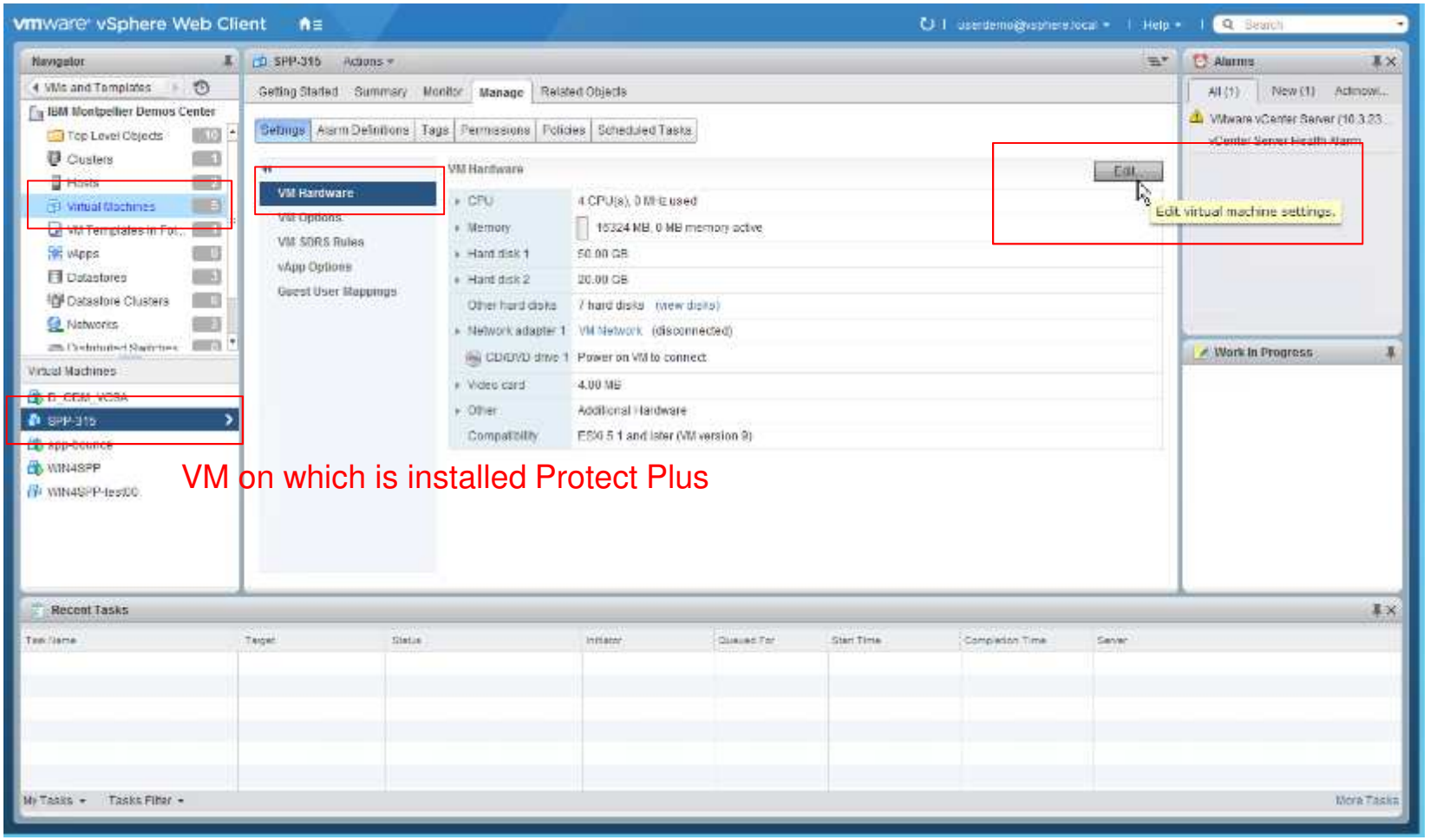


IBM Spectrum Protect Plus **: Backup Storage configuration : Dashboard view**

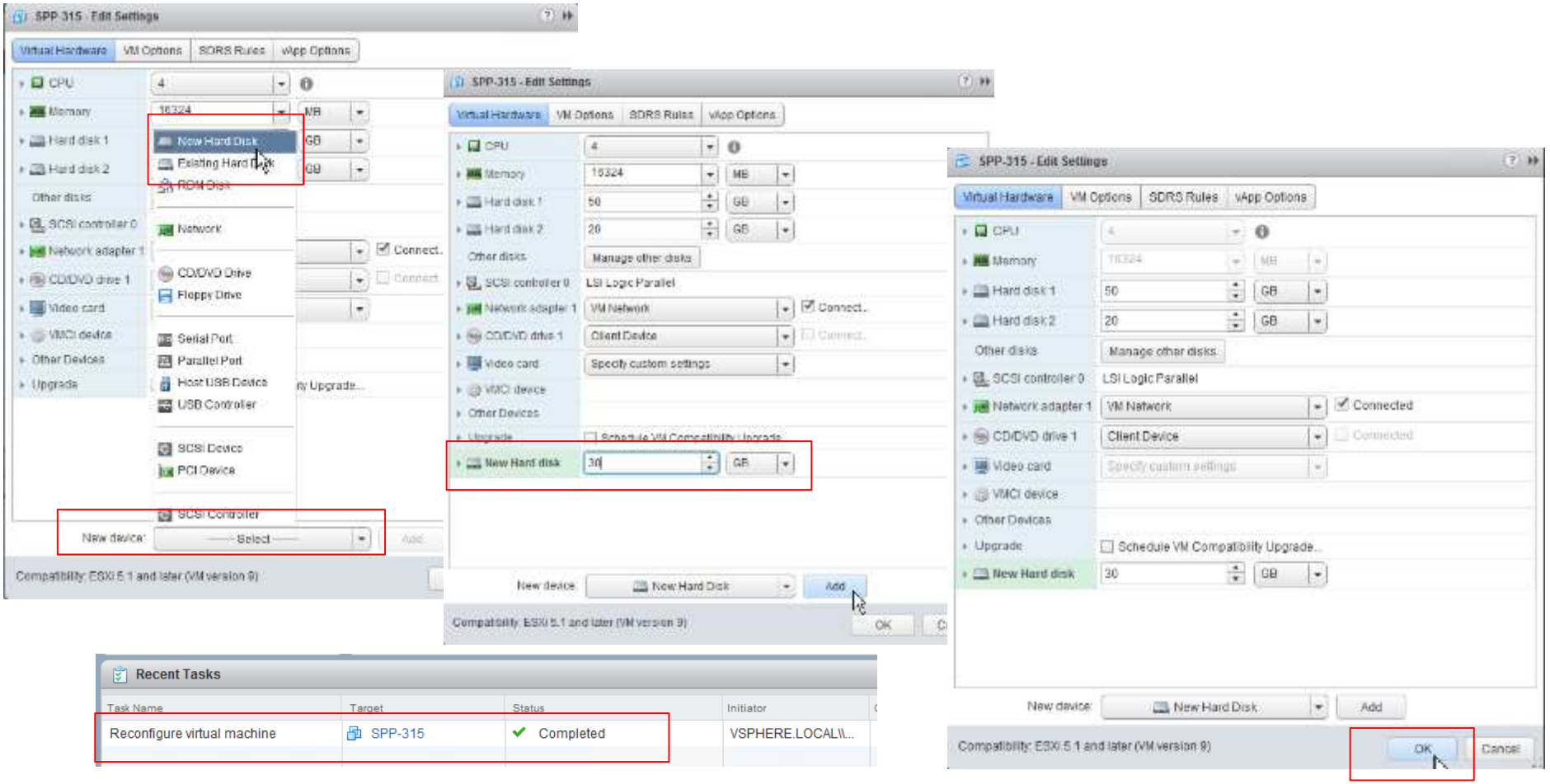


Current storage space used by Spectrum Protect Plus

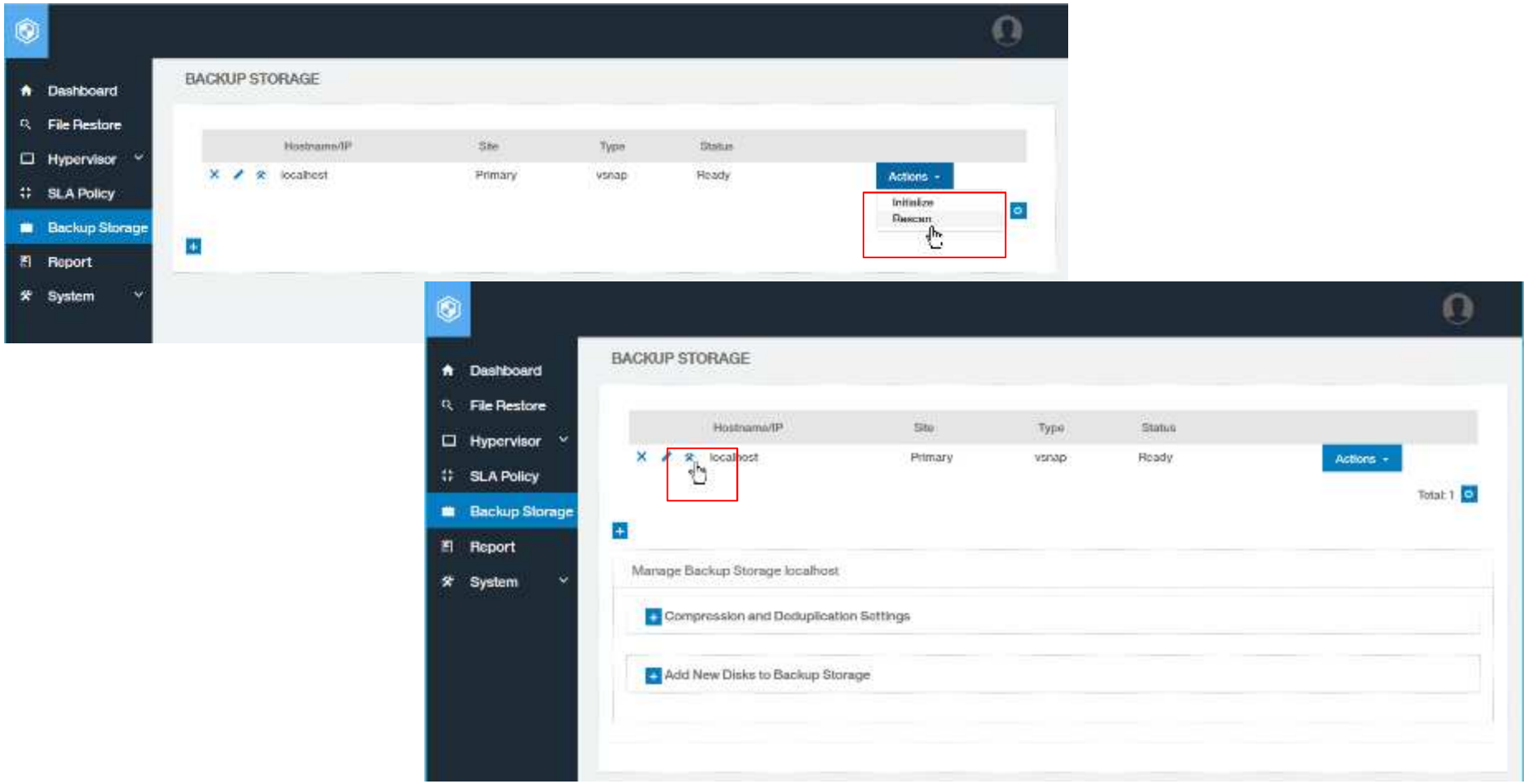
IBM Spectrum Protect Plus **: Backup Storage configuration : Add New disk to Protect Plus VM**



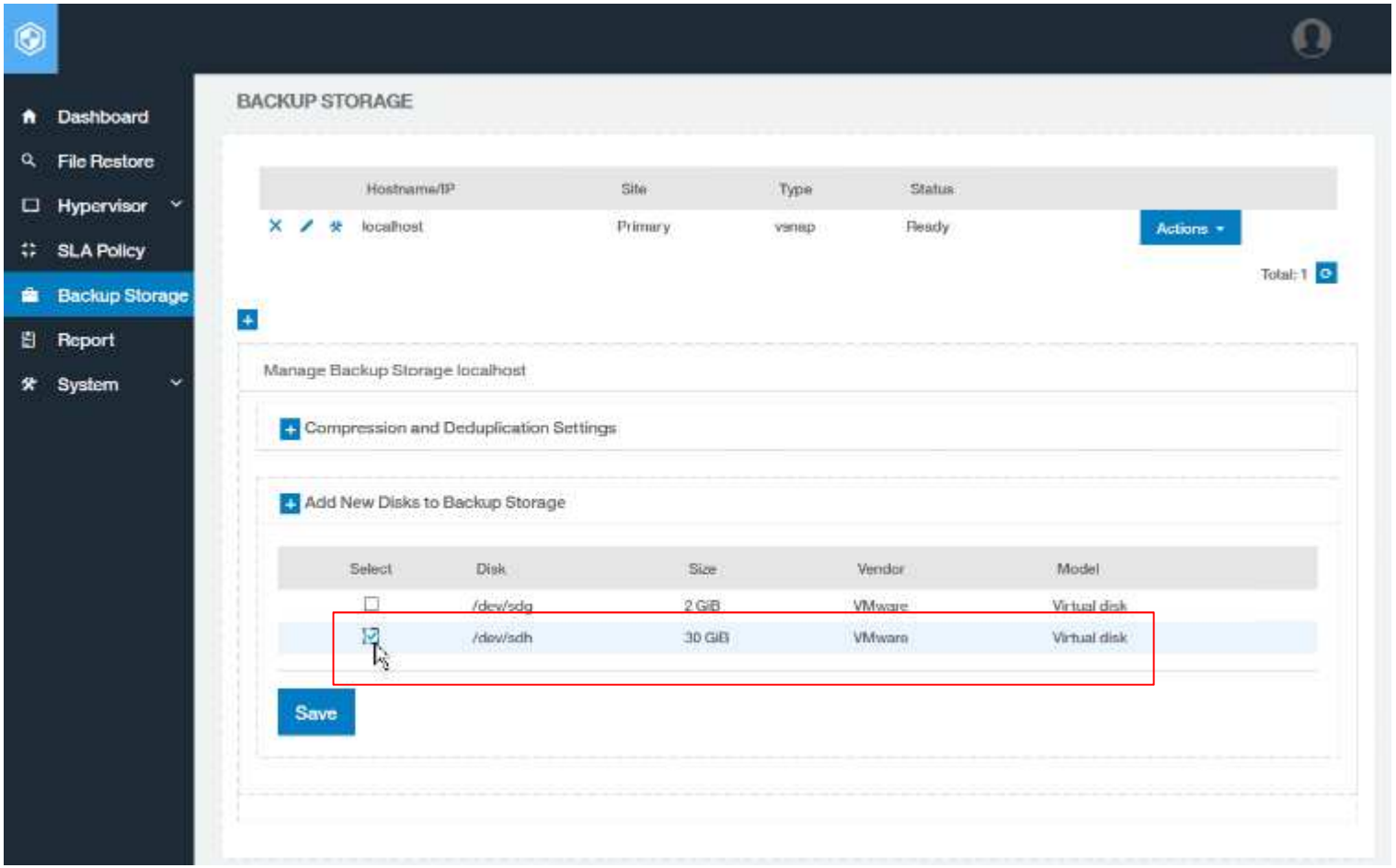
IBM Spectrum Protect Plus **: Backup Storage configuration : Add New disk to Protect Plus VM**



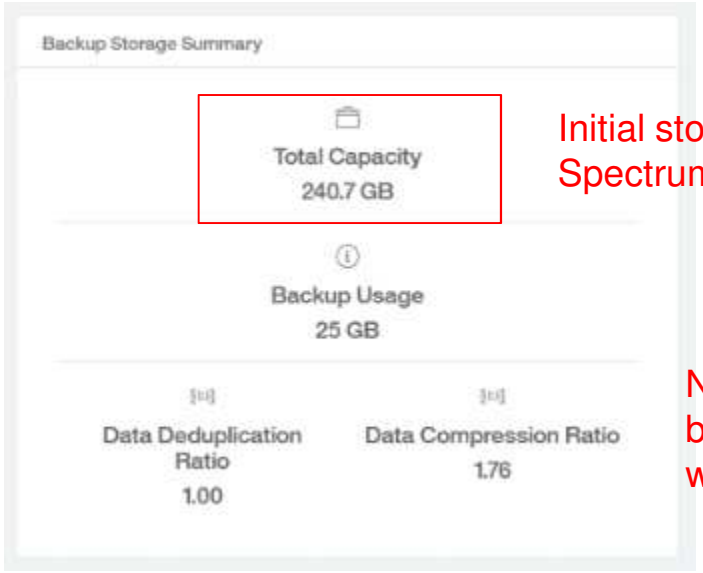
IBM Spectrum Protect Plus **: Backup Storage configuration : Add New disk to Protect Plus VM**



IBM Spectrum Protect Plus **: Backup Storage configuration : Add New disk to Protect Plus VM**

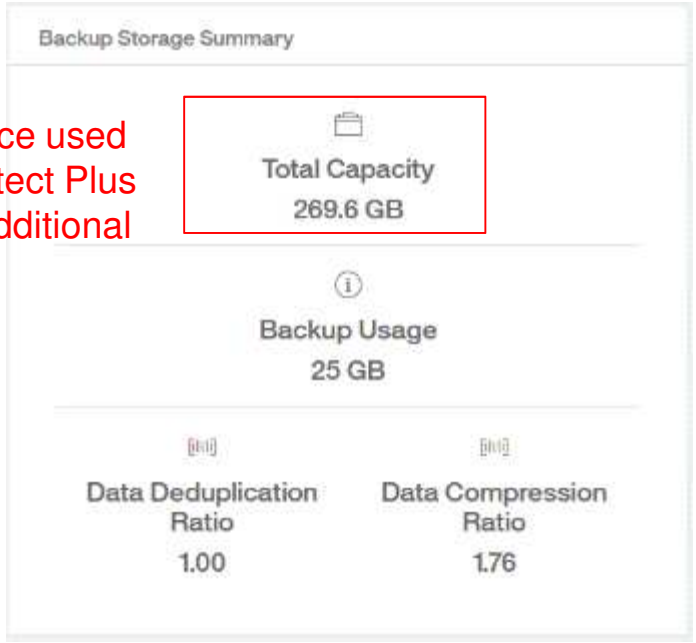


IBM Spectrum Protect Plus **: Backup Storage configuration : Dashboard view**

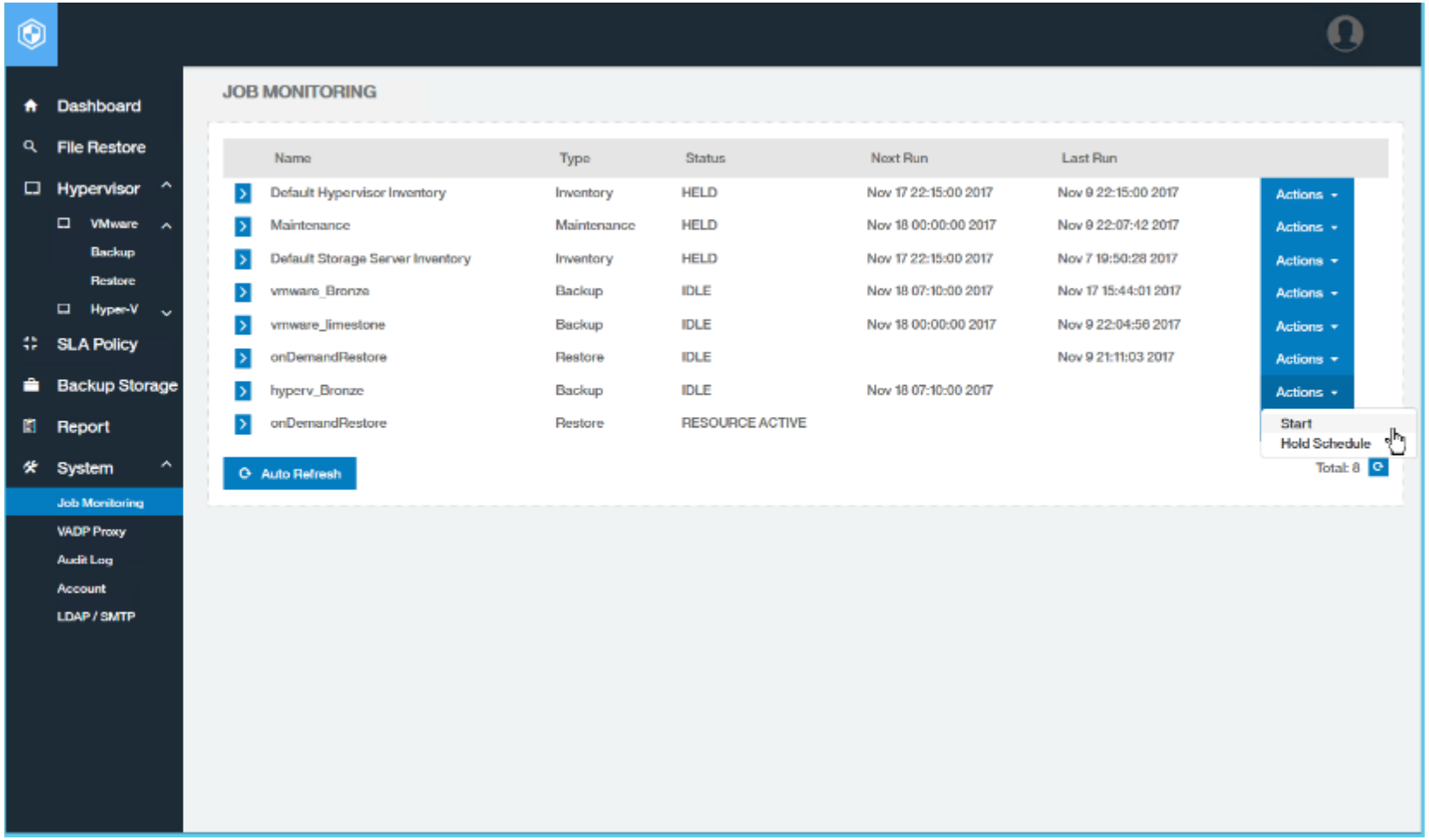


Initial storage space used by Spectrum Protect Plus

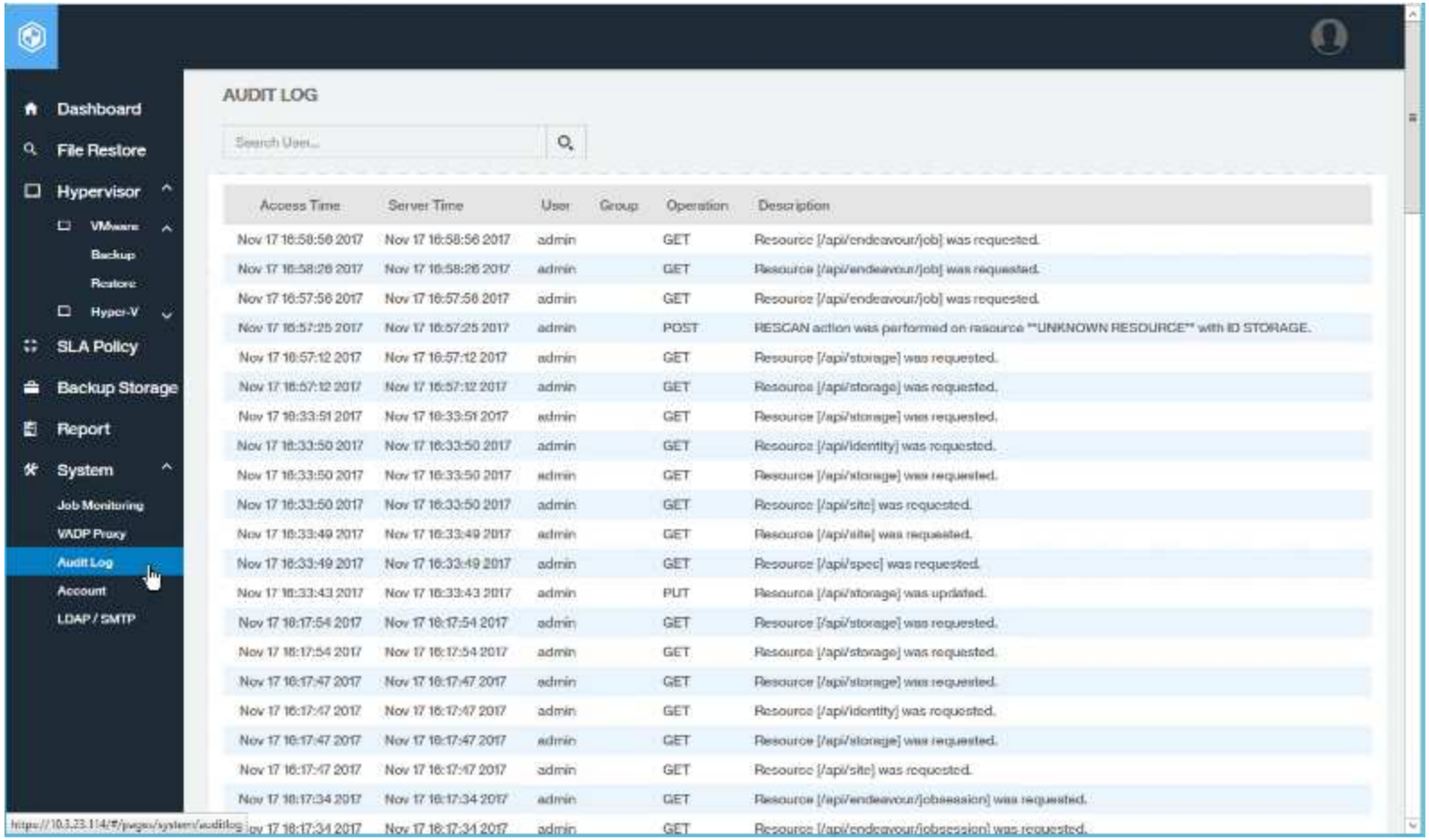
New storage space used by Spectrum Protect Plus with the 30 GB additional



IBM Spectrum Protect Plus **: System : Jobs Monitoring**



IBM Spectrum Protect Plus **: System : Audit Log**



Questions?

Thank you.

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