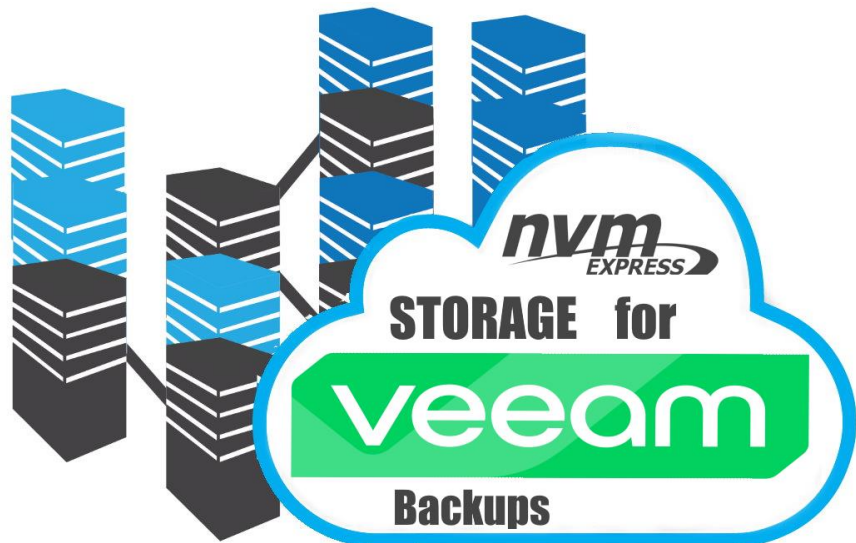


Veeam Storage Appliance

Whitepaper

HYPERSCALERS



Wednesday, 20 March 2024

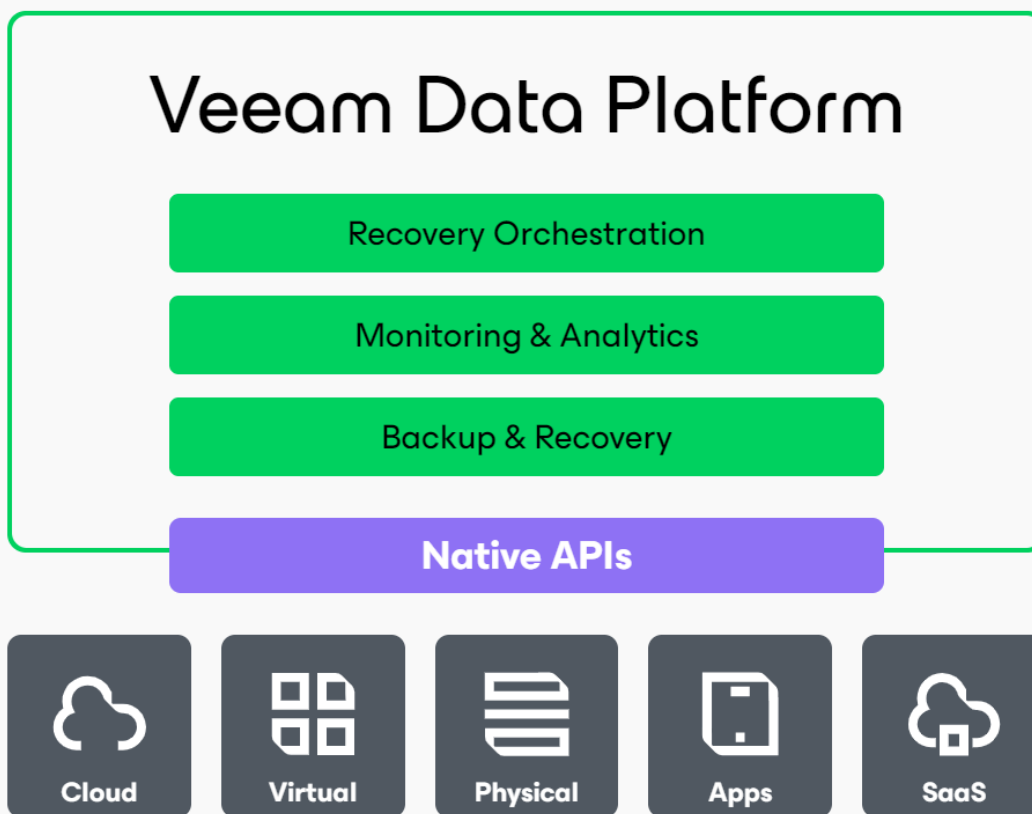
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INTRODUCTION

The Hyperscalers Veeam Backup and Recovery solution is holistic inclusive of hardware and software that enables service providers to perform blazingly fast (up to 51GB/s), consistent, and easy to use backups using Veeam.

Veeam backups can be sent to various storage mediums with single point of control to set up and schedule backup of virtual machines, workstations, and hypervisors. The solution offers storage mediums such as file systems, object, and tape. The solution also offers strategies for ransomware protection, mitigation, and migration. This document focuses on few of these storage features offered by Veeam Backup and recovery aspects of Veeam Data Platform [1].



On-Premises · In the Cloud · XaaS

Digital IP Appliance Design Process

Hyperscalers [2] has developed a Digital- IP-Appliance Design Process and an Appliance Optimizer Utility which we use in conjunction with each other to productise IT-appliances for Digital-IP owners needing to hyperscale their services quickly, reliably and at a fraction of traditional costs.

Appliance Optimizer Utility AOU

The Appliance Optimizer Utility (AOU) automates the discovery of appliance bottlenecks by pinging all layers in the proposed solution stack. A live dashboard unifies all key performance characteristics to provide a head-to-head performance assessment between all data-path layers in the appliance, and also as a comparison between holistic appliances.

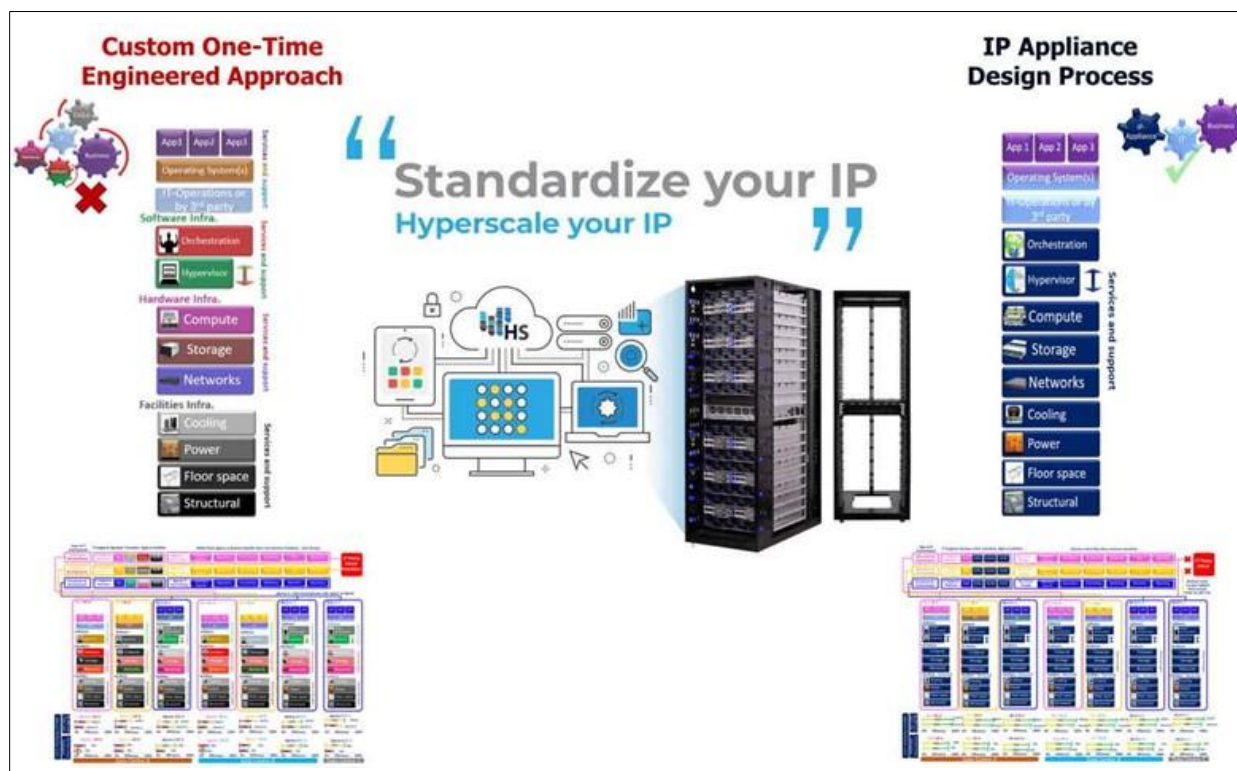


Figure 1 Digital IP-Appliance Design Process

Infrastructure Setup

Veeam Backup and Replication software involves minimum of two nodes one for the control and scheduling aspect of the back up and disaggregated storage backend providing storage. We have validated results with the following environment.

Veeam Backup and Replication node (Control)

Server Model	Number of Nodes	CPU	RAM	NIC Mezz	Storage Card	PCIe Devices	Storage Drives	OS
S5X D53X-1U	1	Intel Xeon 4310 x 2	32/3200 MHz x4 units	ConnectX 5 10/25G (active)	Null	Null	DapuStor R5100 (7 TiB) x 4	Windows Server 2019

Disaggregated XFS storage in RAID 6 (Storage)

Server Model	Number of Nodes	CPU	RAM	NIC Mezz	Storage Card	PCIe Devices	Storage Drives	OS
S6X D54X-1U	1	Intel Xeon 4410 x 2	32/3200 MHz x8 units	ConnectX 5 10/25G (active)	Null	Samsung PM1735 (1.6TB)	DapuStor H5100 (7 TiB) x 4	Ubuntu 20.04 (5.15.0-89-generic)

Disaggregated Object Storage provided by [HyperFlow](#) (Storage)

Server Model	Number of Nodes	CPU	RAM	NIC Mezz	Storage Card	PCIe Devices	Storage Drives	OS
S5X D53X-1U	2	Intel Xeon 4310 x 2	32/3200 MHz x8 units	ConnectX 5 10/25G (active)	Null	ConnectX-5 100 GbE	DapuStor R5100 (7 TiB) x 4	Ubuntu 20.04 (5.15.0-91-generic)

2 FEATURES

Veeam Backup and Replication software features its flexibility in attaching to the storage backend. Few of the storage options include,

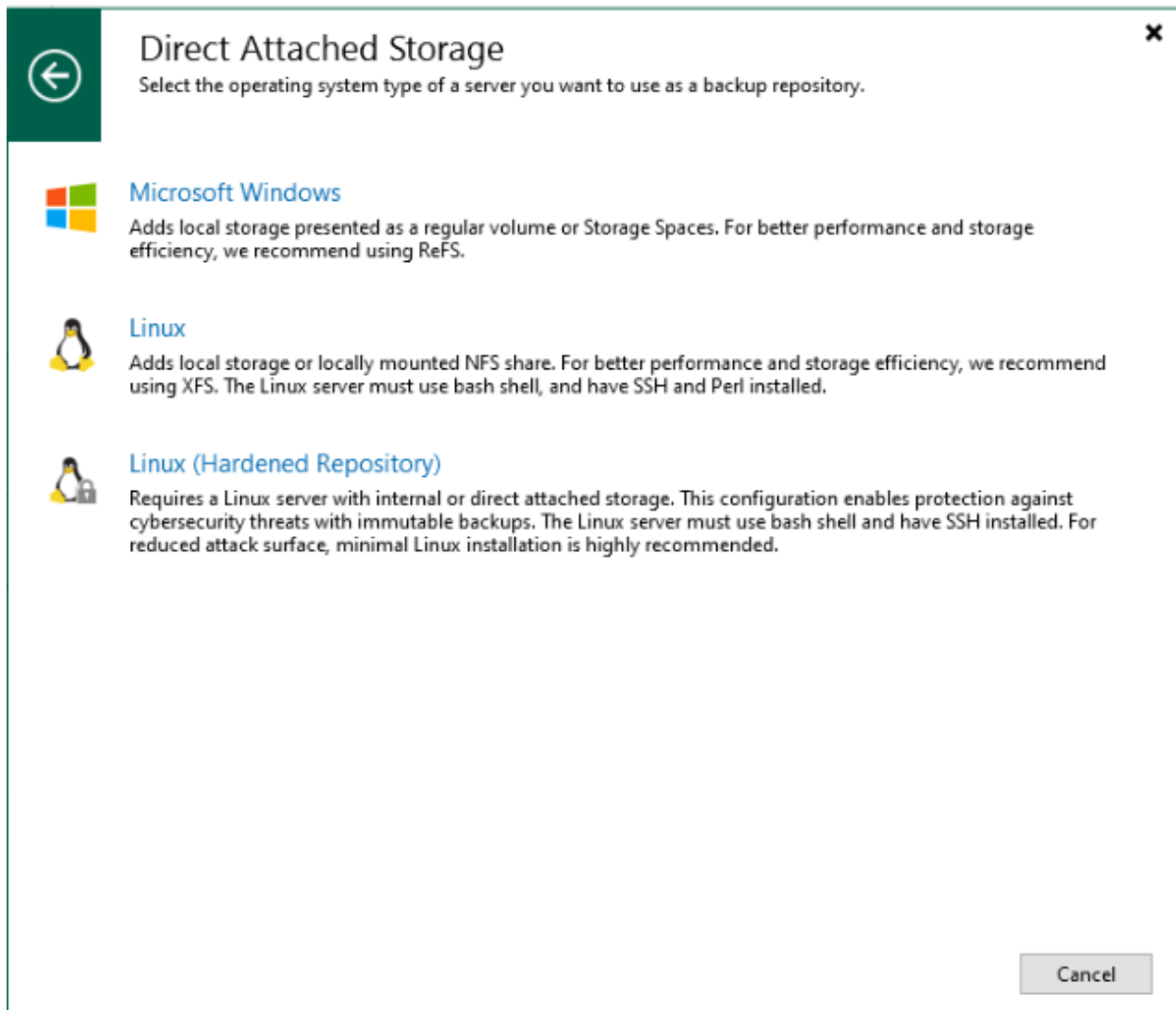
1. Direct Attached Storage
2. Network attached storage
3. Object storage

Veeam Backup and Replication also integrates with existing VMWare / Hyper-V environment to backup, replicate and migrate virtual machines and other resources.

The solution also offers backup of individual workstation, desktops running Windows, Linux, Mac OS.

Direct attached storage

This type of storage can be with in the server and/or can be a directory or disk in another server over the network.




The screenshot shows a dialog box titled "Direct Attached Storage" with a close button (X) in the top right corner. Below the title is a subtitle: "Select the operating system type of a server you want to use as a backup repository." There are three options listed, each with an icon and a description:

- Microsoft Windows** (Windows logo icon): Adds local storage presented as a regular volume or Storage Spaces. For better performance and storage efficiency, we recommend using ReFS.
- Linux** (Tux penguin icon): Adds local storage or locally mounted NFS share. For better performance and storage efficiency, we recommend using XFS. The Linux server must use bash shell, and have SSH and Perl installed.
- Linux (Hardened Repository)** (Tux penguin with padlock icon): Requires a Linux server with internal or direct attached storage. This configuration enables protection against cybersecurity threats with immutable backups. The Linux server must use bash shell and have SSH installed. For reduced attack surface, minimal Linux installation is highly recommended.

A "Cancel" button is located in the bottom right corner of the dialog box.


Network attached storage.

This type of storage can be large pool of storage over the network offering File system through a cluster of servers.




Network Attached Storage ✕

Select the type of a shared folder you want to use as a backup repository.



NFS share

Adds an NFS share. This is the recommended configuration for leveraging storage capacity provided by NAS devices.

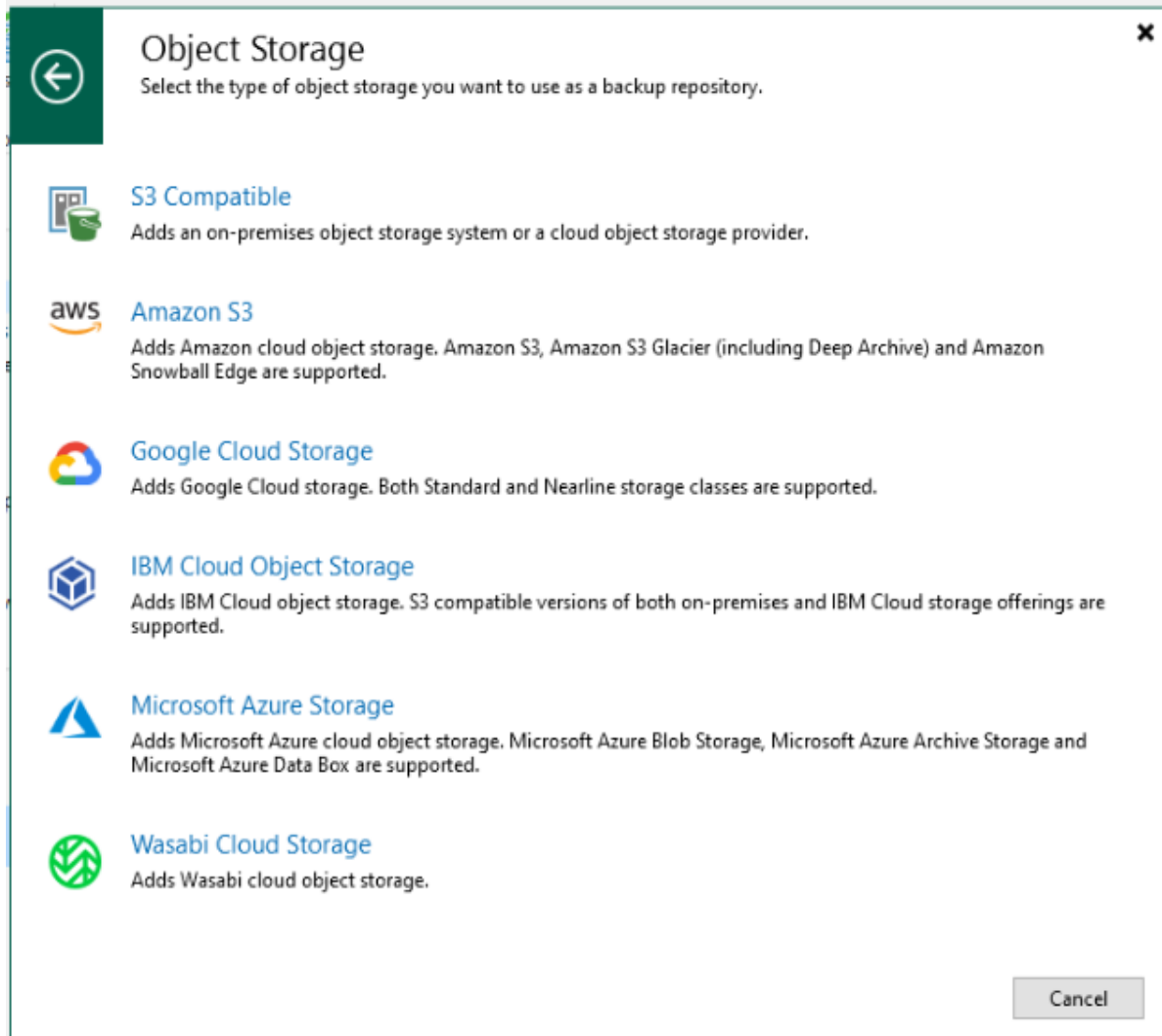


SMB share

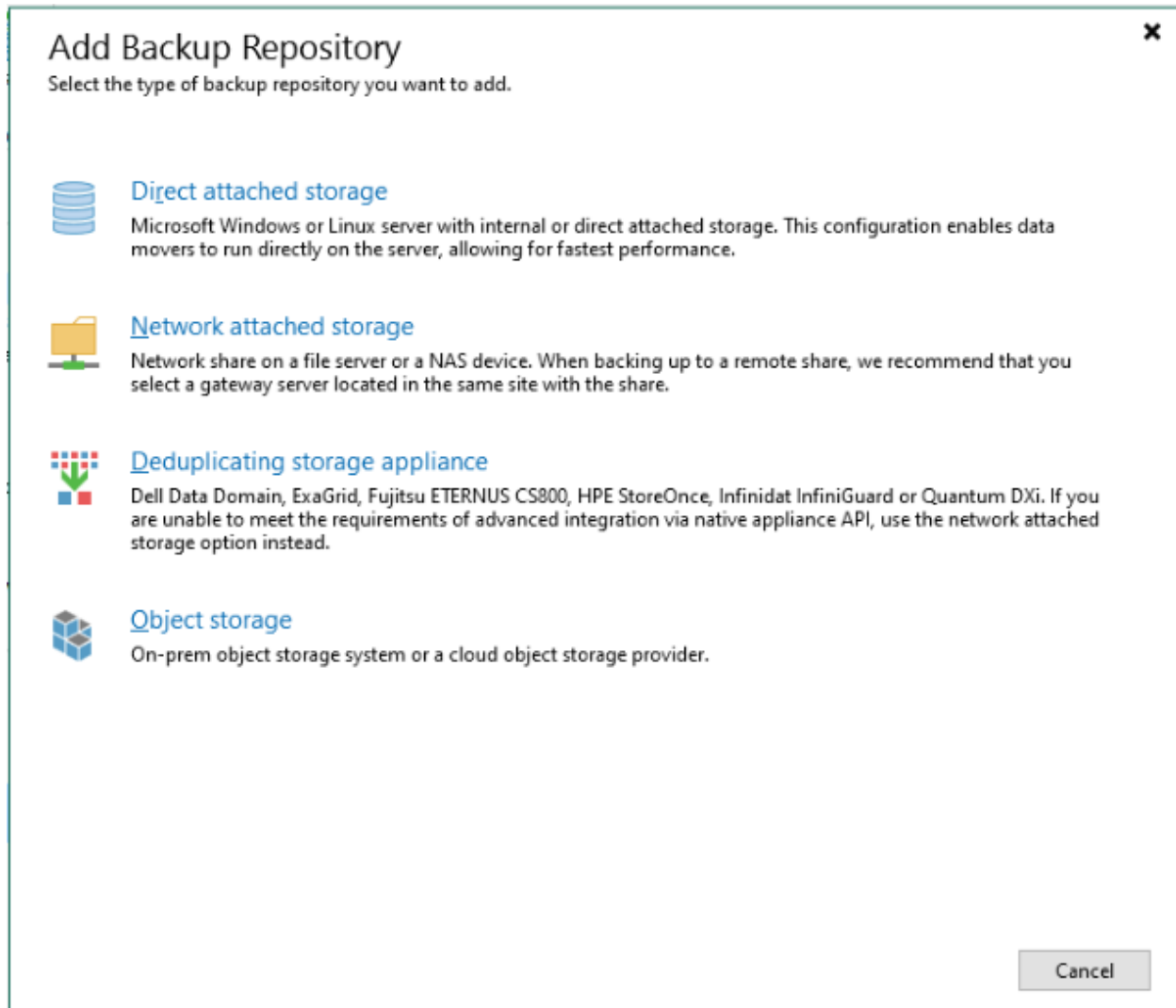
Adds an SMB (CIFS) share. For reliability reasons, this configuration is recommended for continuously available (CA) network shares only.

Object storage

The solution can integrate with any on premise object storage (S3) environment and public cloud storage from leading providers.

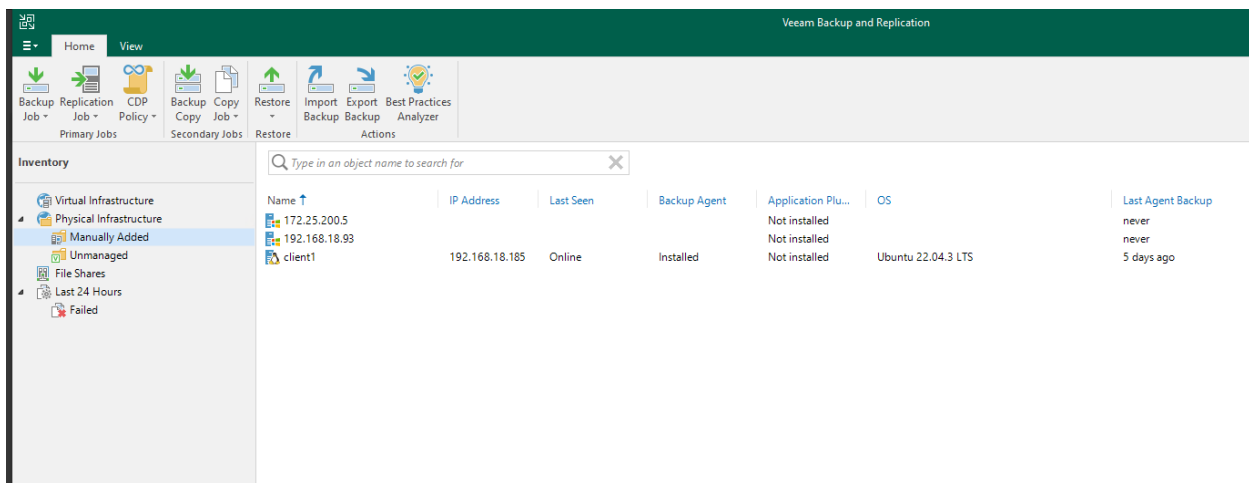
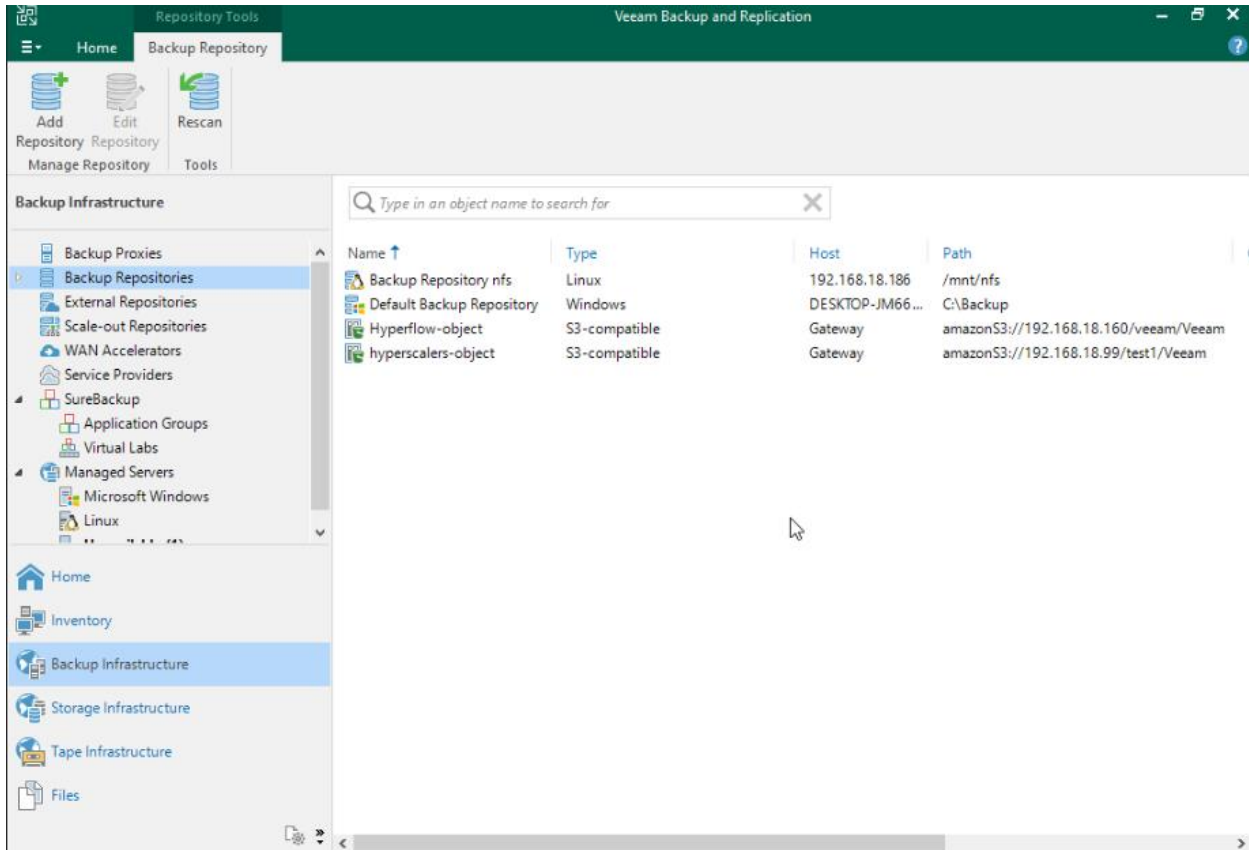


The following image shows the object storage (on prem cloud), network file system (backed by xfs) storage attached to Veeam backup and replication, which can be utilised by the clients (Bare metal/ VMs)



The following is an example showing various storages attached to Veeam which can be utilised to schedule to use for back up.

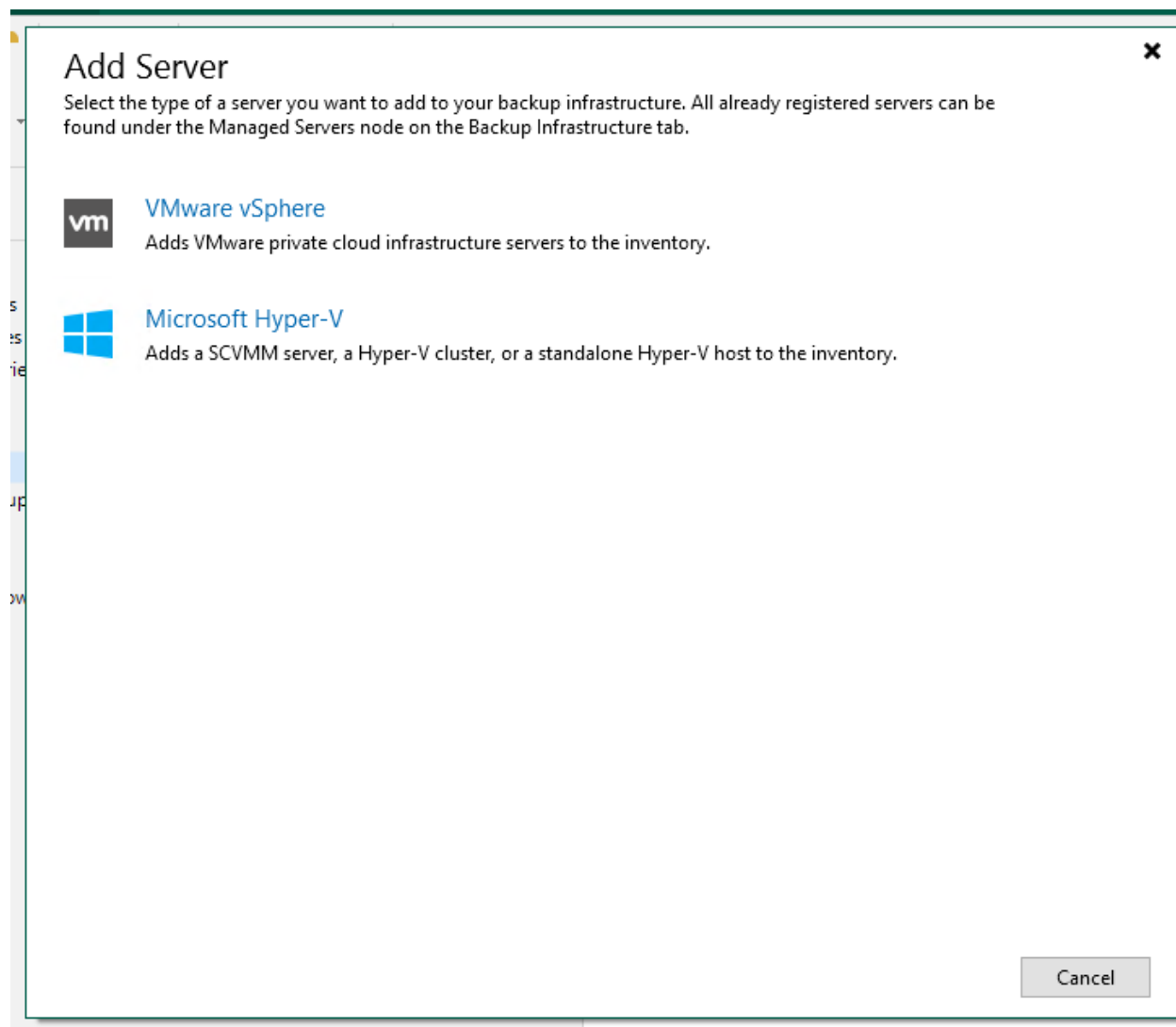
In the following, Backup Repository nfs is backed by XFS NVMe storage in RAID 6. Hyperflow-object (NVMe/ 2 way replicated) and hyperscalers-obeject (SAS / 3 way replicated) are on premise cloud environments backed with HyperFlow. Infrastructure under protection includes one bare metal machine and two virtual machines within our network.



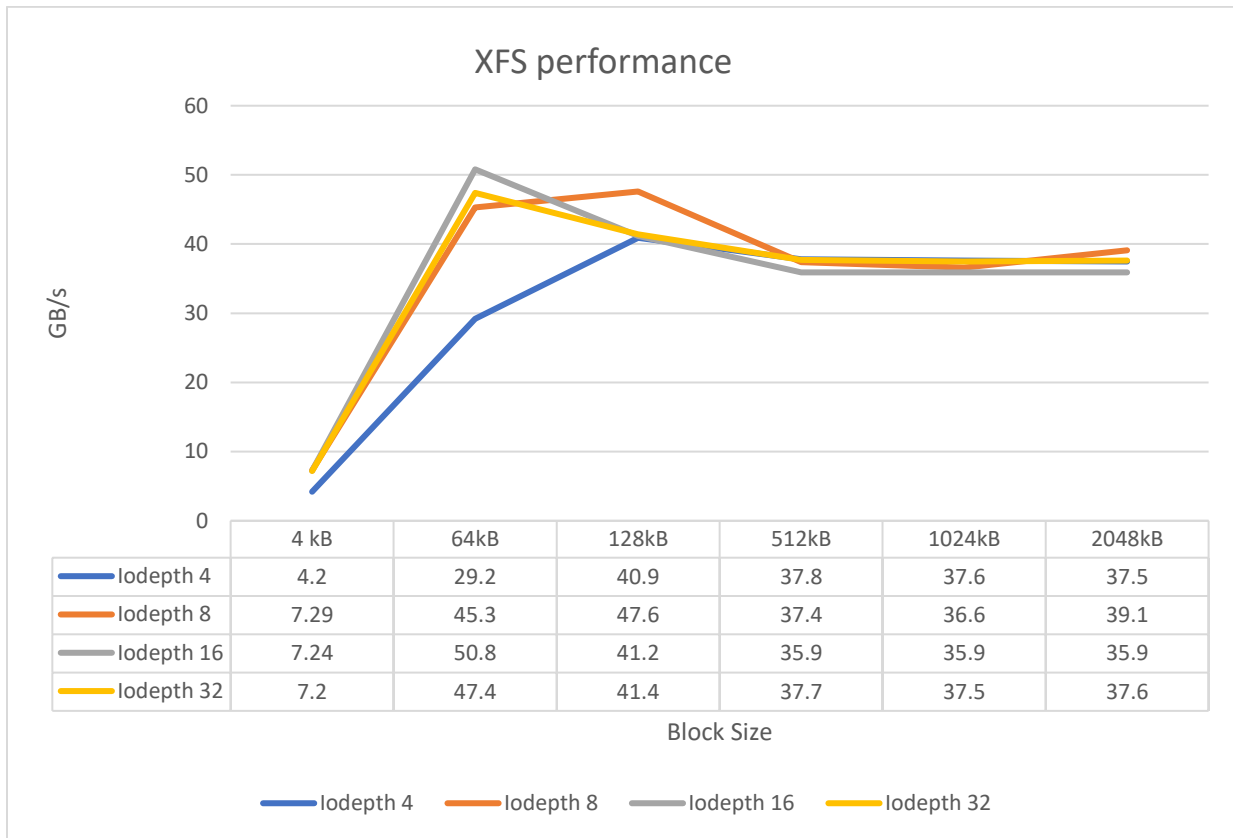
Veeam Back up and Data replication solution offers native connectivity to the following hypervisors.

1. VMWare vSphere
2. Microsoft Hyper-V

One can back up virtual machines from other hypervisors (Eg: Proxmox, HStack) by utilising individual machine backup.



The following are the results of XFS in RAID 6 with Gen5 server/ drives attached to Veeam as Direct attached storage with varying IO depth and block sizes performed with FIO in the storage node [6].



3 REFERENCES

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