DELL Technologies

Solution Report

Dell Technologies Data Protection for SAP Workloads in Google Cloud

This technological overview explains the Data Protection offering from Dell Technologies for SAP workloads in Google Cloud. It provides the basic guidelines and elements needed for seamless backup and recovery. Dell Technologies Data Protection engineering partners with Google Cloud to bring our customers' SAP S/4HANA enterprise workloads to their cloud infrastructure using Dell EMC NetWorker and PowerProtect DD Virtual Edition products. This partnership creates a solution through a specific framework in which both parties accept it as a viable, transparent and easily deployable by our mutual customers.

Why this unique partnership is important to your business?

As more IT organizations continue to move applications and data to the cloud, the value of data protection is more important than ever. Solid and reliable data protection workflows guarantee data is always available and ready for recovery when needed and ensure little or no downtime for our customers' business operations. Now, deployment of a Dell EMC Data Protection Suite with NetWorker, PowerProtect DD Virtual Edition and certified native integration with SAP S/4HANA, makes it easy to protect your most critical workloads in Google Cloud.

Dell EMC products and Google Cloud together provide a customer-centric cloud experience, combining security, automation and functionality in public and hybrid-cloud environments for customers of all sizes, from SMBs to the Enterprise. Customers who have high service-level (SLA) requirements on premises can also rely on a robust and validated cloud backup solution for their SAP workloads.

Benefits

- In-cloud Enterprise-Class data protection
- Native tool integration with SAP S/4HANA & BR*Tools
- Industry-Leading deduplication
- Instant Access & Restore
- Backup to object store for long-term retention lowering on-prem tape costs
- Centralized single management interface
- High Performance & Scale up to 96TB per instance
- Native cloud support

Why *Dell Technologies Cloud Data Protection*?

Dell Technologies Data Protection cloud solutions bring proven data protection for distributed hybrid and multi-cloud platforms across edge, core and cloud to Google Cloud. As customer data grows exponentially, only innovative trusted solutions can protect data at a global scale. As organizations continue their IT transformation and migrate and modernize workloads to cloud, hybrid cloud and multi-cloud environments, Dell EMC's proven data protection products will maximize cloud-based infrastructure investments. Dell EMC offers the fastest and easiest path to the cloud with a proven architecture. The following ESG Analyst paper does a really nice job of explaining more on why a Dell EMC cloud-based infrastructure is desirable to our SAP S/4HANA users; Understanding the Economics of In-Cloud Data Protection - White Paper (2019)

Features:

- Dell EMC PowerProtect DD Virtual Edition (DDVE) gives customers the benefits of the world's most trusted protection storage and the simplicity, flexibility and efficiency of a software-defined solution. PowerProtect DDVE is simple to configure and deploy and

can be up and running within minutes. Customers could start small and grow as needed while using a single management interface for multiple instances.

  - PowerProtect DDVE scales up to 96TB per instance – on-premises and in the cloud for larger workloads.
  - PowerProtect DDVE in cloud: supports backups to object store for long term retention vs. physical tape, benefiting users with increased efficiency and a lower TCO.
  - In addition, as a storage at scale solution; Dell EMC provides Electronic Licensing Management System to enable flexible deployment and the ability for customers to purchase in 1TB increments.
  - Included in the product is DD Boost for increasing backup speeds up to 50%, DD Encryption for enhance data security, and DD Replicator which enables network-efficient replication for fast time-to-DR readiness.
  - Centralized management available for DDVE on-prem and in the cloud via PowerProtect DD Management Center (DDMC)
  - Supported on:
    - Google Compute Engine
    - VMware ESXi 5.5, 6.0, 6.5, 9.0 and after
    - Hyper-V (Windows Server 2012 R2, Windows 2016)
    - KVM Linux distributions from Ubuntu, RedHat, SUSE, and CentOS
    - Secure Multi-tenancy
  - Multiple replication technologies: virtual to physical, physical to virtual, virtual to virtual, and virtual to cloud
  - VMware vSphere High Availability and fault tolerance support
  - DD System Manager and PowerProtect DD Management Center (DDMC) support for manageability
  - Current in cloud application support: NetWorker Virtual Edition, Avamar Virtual Edition and DD Boost

- Expands capacity in 1TB increments

- Dell EMC's Data Protection Suite with NetWorker offers a full-feature solution to support SAP workloads being protected across multiple environments from core to edge to cloud. Customers gain visibility into their data protection environment across multiple systems, multiple sites and protect multiple workloads running in a variety of configurations; transfer backup data securely and efficiently into the cloud. Dell Technologies is #1 in Data Replication and Protection Software[1]. When you pair Data Protection Suite with PowerProtect DDVE, they improve their SLOs with up to 38% faster backups and up to 36% faster restores in addition to enabling efficient data movement with deduplication[2]. The most trusted protection storage on the market PowerProtect Data Domain boasts up to 65x deduplication rates[3] and an invulnerability architecture that verifies data in-line to keep it protected.

- Dell Technologies wants to let SAP admins protect their data using their native tools, but also provide them with the simplicity and efficiency of backing up directly to PowerProtect DDVE. This seamless experience eliminates the complexity of traditional backup software and puts control in the hands of SAP data owners, letting them have the control they need to do backups when they want. Data management via Data Protection Suite with NetWorker offers SAP S/4S/4HANA & BR*Tools integration for backup and recovery.

- Certified with SAPs Backint API, data protection solutions integrate directly into S/4HANA Studio, giving SAP basis and database administrators direct control over backup and recovery, enabling self-service without any loss of visibility.

[1] IDC 2Q19 Storage Software and Cloud Services Overview

[2] Based on Dell EMC internal testing with DD Boost protocol on DD9900 with DDOS 7.0 vs. DD9800 with Data Domain OS 6.2, Sep 201

[3] Based on Dell EMC internal testing with DDOS 7.0, Aug 2019. Actual results may vary.

- DD Boost for SAP provides application centric data protection for SAP applications running on Oracle databases and SAP S/4HANA giving the SAP and/or SAP S/4HANA administrator the ability to perform backups and restores through the familiar SAP BR*TOOLS GUI, CLI and SAP S/4HANA Studio directly to a PowerProtect DD system; without the need for an external backup application.

- DD Boost advances ***PowerProtect DDVE performance and simplicity differentiators over all competitors***. DD Boost provides advanced integration between PowerProtect DDVE and leading backup and enterprise applications. Using DD Boost, the application server only sends unique data to a PowerProtect DDVE. This enables more backups with existing resources, 20 to 40 percent less overall impact to the server. Meet stringent protection SLOs for your high-value workloads by backing up directly from the application server to PowerProtect DDVE. As a result, DD Boost agents send over unique data blocks, reducing storage utilization and network bandwidth by up to 98%. Recovery is simple - copies are stored as full backups, and only changed data is pulled back. In addition, data base administrators can instantly access their backups stored on Dell EMC's backup storage for simplified granular recovery.
  .

Deployment:

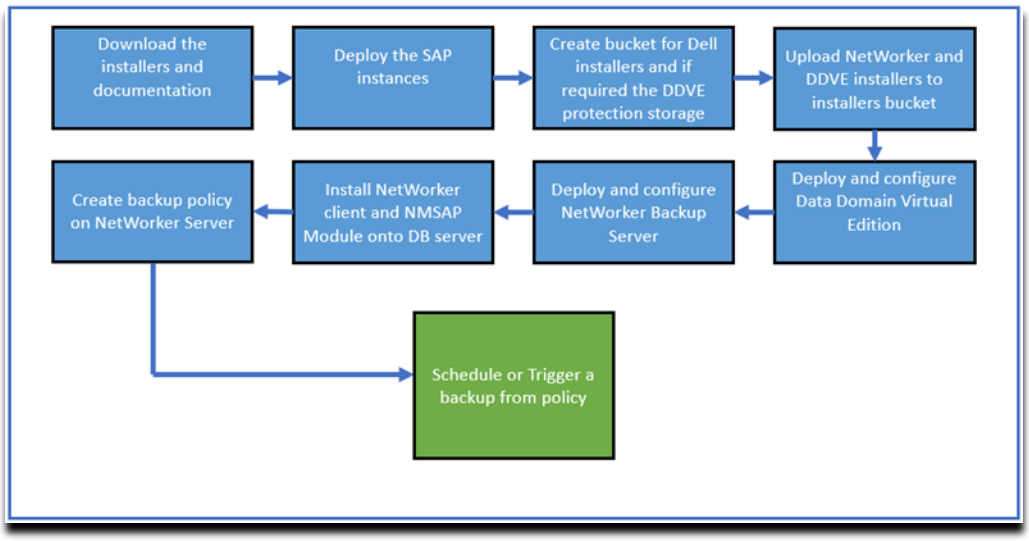
The Deployment Flowchart diagram below captures the steps to be followed to protect SAP S/4HANA servers in Google Cloud with Dell EMC Data Protection. Our components today are available to be installed manually and will be available in marketplace shortly. Our Professional Services team also has different service plans to enable customers to do the same.

Components:

- SAP S/4HANA Database Server
- Google Cloud for SAP Cloud Appliance Library - suite of public cloud computing services offered by Google
- PowerProtect DDVE v4.0 with 7.0.0.7 - software-defined version of PowerProtect DD Series Appliances / Data Domain
- NetWorker 19.2 for Linux for x64- Software-based product that centralizes, automates, accelerates backup and recovery
- NetWorker 19.2 Module for SAP Linux x64 (64-bit) - add-on module for the NetWorker server and client that provides native integration with SAP S/4HANA for this solution
- NetWorker Runtime Environment (NRE) file for Linux
- NetWorker Runtime Environment (NRE) file for Windows

	DDVE* at 96TB
Max Throughput	Up to 4TB/hr
Max Throughput (DD Boost)	Up to 11.2TB/hr
Logical Capacity	Up to 4.8PB
Logical Capacity with Cloud Tier	Up to 14.8PB
Usable Capacity	Up to 96TB
Usable Capacity with Cloud Tier	Up to 288TB

Deployment Flowchart:

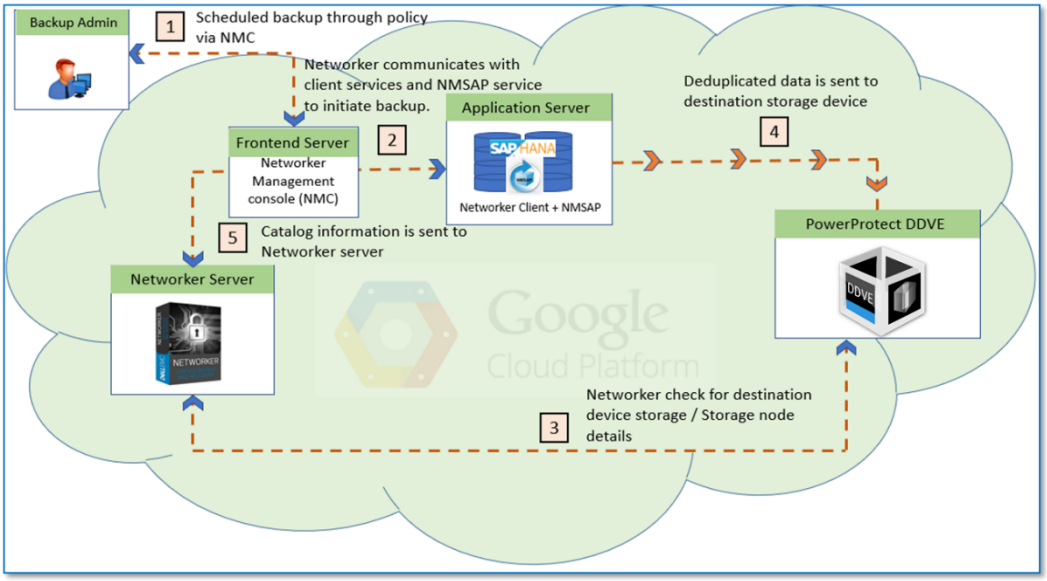


Self-Assessment Architecture and Test Flow

Backup and restore of SAP S/4HANA database using NetWorker Module (NMSAP) were executed with the below following methods:

A. Performing scheduled backups of SAP S/4HANA data

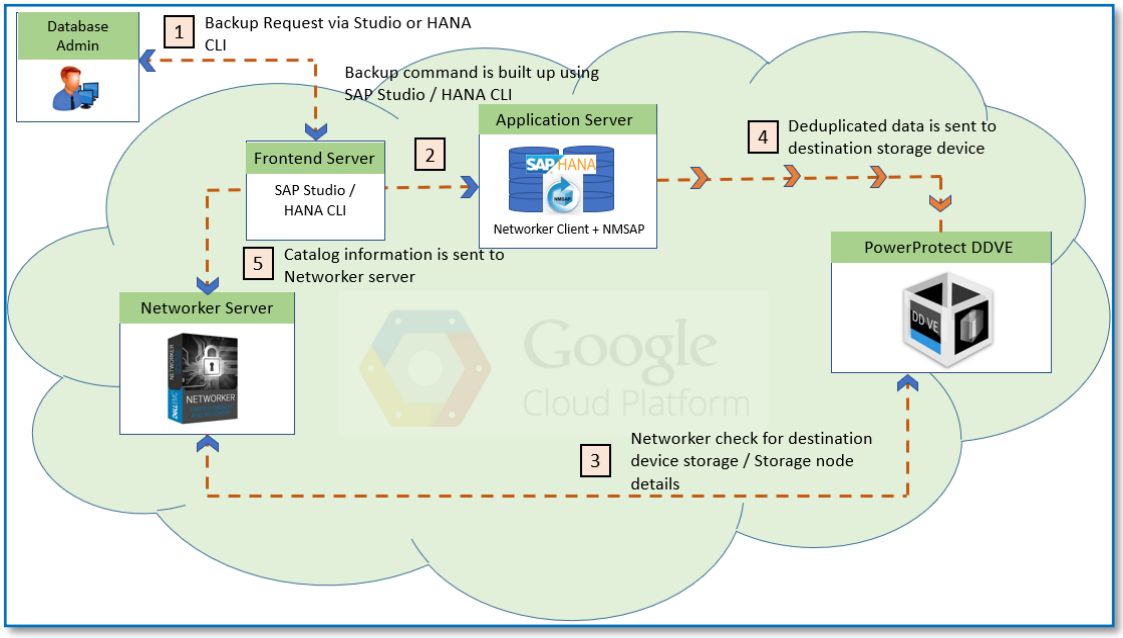
1. Perform scheduled backups
2. Monitor scheduled backups
3. Cancel scheduled backups



Architectural flow of NetWorker Server Backup Initiation

B. Performing manual backups and recovery with SAP S/4HANA Studio

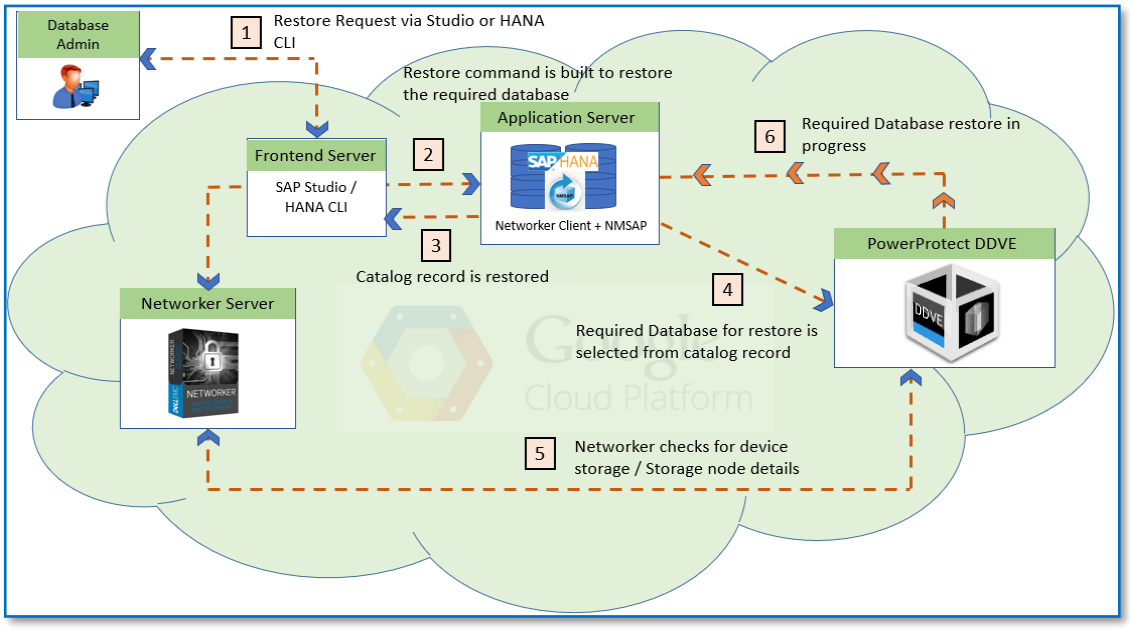
1. Perform manual backups with SAP S/4HANA Studio
2. Delete backups with SAP S/4HANA Studio
3. Perform restore with SAP S/4HANA Studio



Client initiated (SAP S/4HANA Studio) backup flow

C. Performing manual backups and recovery with the SAP S/4HANA CLI

1. Perform manual backups with the SAP S/4HANA CLI
2. Cancel manual backups
3. Check NMSAP backups with the SAP S/4HANA CLI
4. Perform recovery with the SAP S/4HANA CLI



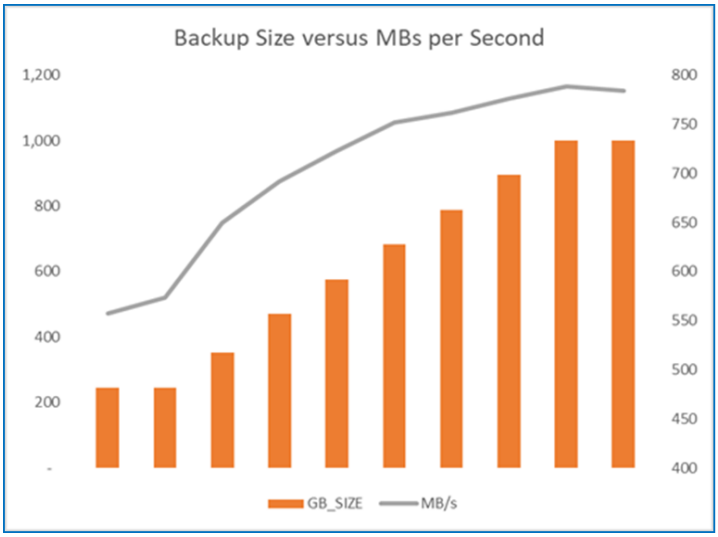
Restore architectural flow

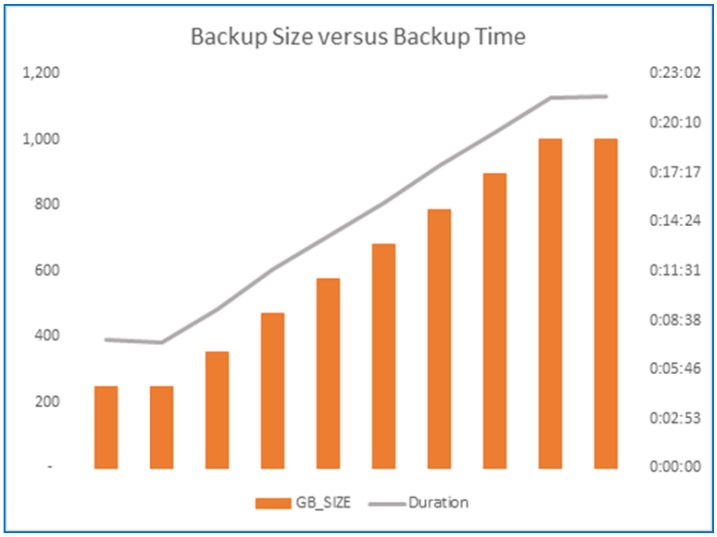
Performance & Test Results

The environment was staged to perform a large database workload being backed up to the cloud instance in the Dell EMC supported incremental 1TB per instance. Start to finish, the workloads were incrementally backed up from 246GiB to 1,001GB; as they increase in size and with DD Boost enabled for deduplication; storage efficiency and throughput improved as expected.

Time to back-up steadily maintained sustainable throughput as the size of the workload increased. The initial backup of 246GB took 7 minutes and 31 seconds and the second one with no change rate took 7 minutes and 19 seconds.

The final 1TB backup took 21 minutes and 46 seconds. As the database grew, throughput goes from 557MB/s to 784MB/s because SAP S/4HANA can do more parallel reads; however, as a practical matter, workloads above 500GB backup time are effectively linear with the backup size.





Support:

The Dell Technologies global support network provides 24x7 coverage—with redundancy and failover—through global customer support centers in North America, Europe, and Asia.

For customer convenience, Dell Technologies offers a single support number for all Dell Technologies customers regardless of which products you have implemented. Sophisticated call handling systems enable efficient dispatching and coordinated delivery via the DELL EMC worldwide logistics organization for around-the-clock parts delivery to rapidly mitigate hardware issues.

Dell Technologies global support centers and field offices are networked by a global CRM system to maximize your total customer experience and ensure rapid resolution of every service request, small or large.

Cost:

Bring Your Own License (BYOL) solutions let you run software on Google Cloud Compute Engine while using licenses purchased directly from the Dell Technologies, giving you the flexibility to purchase and manage your own licenses. Licenses are sold in 1TB increments. For additional cost considerations reach out to the Dell Technologies contact below.

For Google Cloud, continue to work with Google Sales Representatives for cloud costs.

Lowering the Cost for In Cloud Data Protection with Dell EMC

Understanding the Economics of In-Cloud Data Protection - White Paper (2019)

Other Capabilities:

In addition to leveraging these very powerful Dell Technologies data protection architectures for SAP/HANA workloads, our data protection solutions protect a wide variety of customer applications common in SAP landscapes. Some but not limited to include: Oracle, MS-SQL, MySQL, IB DB2, MS-Exchange, MongoDB, Informix IDS, PostgreSQL, Linux & Windows file system workloads and much more.

References:

Johnsonville and Dell EMC Data Protection: Better Together | Dell EMC US

Johnsonville Sausage Case Study

Fieldcore Relies on Dell EMC DDVE

Documentation and Links:

Dell Technologies Data Protection for SAP in GOOGLE CLOUD Technical Brief

Dell EMC Solutions Designed for SAP Landscape Consolidation

Dell Technologies, SAP and SAP S/4HANA

PowerProtect DD Virtual Edition

Next Steps / Contacts:

Please reach out to:

Dierdre Spina
GAM – Global Alliances / Google
Dell Technologies | Data Protection Solutions
mobile + 1 480.271.8421