

Actifio GO

Backup and Disaster Recovery-as-a-Service

for Google Cloud

Support Matrix

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Deployment Information

Supported Hypervisors for Sky Deployment

Installation of Actifio Sky (data mover) virtual appliance is supported only on Google Compute Engine.

Supported Network Protocols

Actifio VDP supports networking over:

- IP - Internet Protocol (IP) is supported only for VMware virtual machines backup and leverages VMware Network Block Device (NBD) transport mode
- iSCSI
- NFS - Actifio supports NFS V3 (only) for capturing and presenting data in following deployment configurations:
 - o Presenting any backups to VMware hosts via a NFS datastore
 - o Presenting a staging disk for connector-based data capture within a VMware VM

Supported Environments for Backups

Agent Based Backups

Actifio agent (a.k.a connector) can back up & recover supported databases and file systems of supported Microsoft Windows & Linux operating systems in the following environments.

Table 1:

Application Type	Running on Compute Instances	Running on GCVE VMs
Databases	Yes	Yes
File Systems	Yes	Yes

Agentless Backups

Actifio supports VM backups in the following environments without needing an agent inside the VM:

- GCE Instances (leverages Google PD snapshot APIs)
- GCVE VMs (leverages VMware VADP APIs)

Object Storage Compatibility for OnVault

Actifio OnVault supports the following Google cloud storage.

Table 2:

Storage Type	Min Required Actifio Version
Google Nearline	V10.0.1
Google Coldline	V10.0.1
Google Archive	V10.0.4

Application Data Virtualization with Actifio Connector

Actifio agent (commonly also known as connector) is a light weight executable that delivers the following advanced capabilities during the data capture and recovery processes.

- **Application Discovery:** Actifio connectors enable deep discovery of databases and file systems configured on a production host
- **API integration:** Where possible, Actifio connectors integrate with the application specific native APIs/commands for efficient capture of application data
- **Change Block Tracking:** In situations where the production applications do not have a built-in change block tracking, Actifio connector introduces change block tracking on select platforms
- **Application aware recovery/mount:** Actifio connectors have built in application awareness. The connector enables users of Actifio to leverage this awareness to instantiate usable instances of applications during recovery mount operations thereby eliminating the need for performing manual/scripted actions post mount.
- **Generic Application Data Capture framework:** Actifio Connectors provide a generic framework to capture data from any application running on VDP supported Linux operating systems. This framework provides hooks to call custom scripts to achieve application consistent data capture and application instantiation from backup data.

Microsoft Windows Server Support

The Actifio connector supports the following Microsoft Windows operating systems.

Table 3:

Operating System Version	Basic Connector Support	Change Block Tracking Support	Min Required Connector Version
Windows Server 2012 ¹	Yes	Yes	V10.0.1
Windows Server 2012 R2 ¹	Yes	Yes	V10.0.1
Windows Server 2016 ¹	Yes	Yes	V10.0.1
Windows Server 2019	Yes	Yes	V10.0.1

¹ CSV configurations only supported on these versions

Linux Operating System Support

Actifio connector supports the following Linux (x86) operating systems.

Basic connector support includes support for File Systems and Oracle databases.

Change Block Tracking (CBT) support includes incremental forever backup capability for other databases.

Table 4:

OS	Version	Basic Connector Support	Change Block Tracking Support	Min Required Connector Version
RHEL ¹	6.1 & up	Yes	Yes ²	V10.0.1
	7.0-7.8	Yes	Yes	V10.0.1
	7.9	Yes	Yes	V10.0.2
	8.0-8.1 ⁴	Yes	Yes	V10.0.1 ⁵
	8.2	Yes	Yes	V10.0.2 ⁵
	8.3	Yes	Yes	V10.0.4
	8.4	Yes	No	V10.0.4
RHEL for SAP ¹	7.7	Yes	Yes	V10.0.4
	8.1	Yes	Yes	V10.0.4
	8.2	Yes	Yes	V10.0.4
SLES ¹	11 SP1-4	Yes	Yes ³	V10.0.1
	12 SP0-4	Yes	Yes	V10.0.1
	12 SP5	Yes	Yes	V10.0.1 ⁵
	15 SP0-1	Yes	Yes	V10.0.1 ⁵
	15 SP2	Yes	Yes	V10.0.4
SLES for SAP ¹	12 SP4	Yes	Yes	V10.0.4
	12 SP5	Yes	Yes	V10.0.4
	15 SP1	Yes	Yes	V10.0.4
	15 SP2	Yes	Yes	V10.0.4

Table 4:

OS	Version	Basic Connector Support	Change Block Tracking Support	Min Required Connector Version
CentOS ¹	6.0-6.10	Yes	Yes ²	V10.0.1
	7.0-7.6	Yes	Yes	V10.0.1
	7.7	Yes	Yes	V10.0.1 ⁵
	7.8	Yes	Yes	V10.0.2 ⁵
	7.9	Yes	Yes	V10.0.4
	8.0-8.1 ⁴	Yes	Yes	V10.0.1 ⁵
	8.2	Yes	Yes	V10.0.2 ⁵
	8.3	Yes	Yes	V10.0.4
Ubuntu	16.04 LTS	Yes	No	V10.0.1
	18.04 LTS	Yes	No	V10.0.1
	20.04 LTS	Yes	No	V10.0.4
Oracle Enterprise Linux ^{1,5}	6.0-6.10	Yes	No	V10.0.1
	7.0-7.6	Yes	No	V10.0.1
	7.7	Yes	No	V10.0.1 ⁵
	7.8	Yes	No	V10.0.2 ⁵
	8.0-8.1	Yes	No	V10.0.1 ⁵
	8.2	Yes	No	V10.0.2 ⁵
	8.3	Yes	No	V10.0.4
	8.4	Yes	No	V10.0.4

¹ Symantec (Veritas) Dynamic Multi Pathing (DMP) is NOT supported

² Change block tracking (CBT) for RHEL 6.x is only supported from RHEL 6.8 onwards and requires kernel version 2.6.32-642.3.1 and above. CBT on CentOS 6.x is supported from CentOS 6.9 onwards.

³ Change block tracking (CBT) for SLES 11.x is only supported from SLES 11.3 (SP3) onwards.

⁴ In rare cases, LVM snapshot command on this OS version may cause the VDP backups to hang. This is a known Red Hat issue. Internal bug ID for this bug as maintained by Red Hat is 1758605. Actifio recommends that you upgrade the Linux kernel to the latest available one on RHEL/CentOS 8.1 release. For more information, visit <https://access.redhat.com/solutions/5049041>. Alternatively, customers can contact the Red Hat / CentOS support team for further assistance.

⁵ Supported only on GCVE VMs and not on Compute Engine instances/VMs

Microsoft SQL Server

Actifio connectors support database consistent data capture (snapshots) from Microsoft SQL Server.

Table 5:

Version	Supported Configurations	Min Required Connector Version
2019	Standalone	V10.0.1
	AAG	V10.0.1
	Failover Instance ¹	V10.0.1
2017	Standalone	V10.0.1
	AAG	V10.0.1
	Failover Instance ¹	V10.0.1
2016	Standalone	V10.0.1
	AAG	V10.0.1
	Failover Instance ¹	V10.0.1
2014	Standalone	V10.0.1
	AAG	V10.0.1
	Failover Instance ¹	V10.0.1
2012, 2012 R2	Standalone	V10.0.1
	AAG	V10.0.1
	Failover Instance ¹	V10.0.1

¹ No support for app-aware mounts into a SQL Server Instance running on a Microsoft Failover Cluster if any of its nodes have been discovered as a virtual machine

Oracle

Actifio connectors enable database consistent data capture of Oracle databases. Oracle must be run in ARCHIVELOG mode. Data capture supports capturing data to staging disks formatted as file systems or presented as ASM disk group targets.

Data can also be captured from Oracle Non Active Data Guard and Active Data Guard configurations.

Table 6:

Oracle Family	Versions	Config Types	Min Required Connector Version
Oracle 19c ⁴	All Versions	Standalone	V10.0.1
		RAC	V10.0.1
		Exadata ²	V10.0.1
		Non Active Data Guard ³	V10.0.1
		Active Data Guard ³	V10.0.1
Oracle 18c ⁴	All Versions	Standalone	V10.0.1
		RAC	V10.0.1
		Exadata ²	V10.0.1
		Non Active Data Guard ³	V10.0.1
		Active Data Guard ³	V10.0.1
Oracle 12c ^{1,4}	12c R1, R2	Standalone	V10.0.1
		RAC	V10.0.1
		Exadata ²	V10.0.1
		Non Active Data Guard ³	V10.0.1
		Active Data Guard ³	V10.0.1

1 App aware mounts require a minimum version of 12.1.0.2 with patch 19404068

2 Oracle Exadata system is supported with iSCSI and NFS

3 Oracle database CBT is enabled on ActiveDG only by Oracle

4 Data capture of Oracle 12c is at container level (that includes all PDBs). App-aware mount on a target is at Container level. Virtual PDBs to an existing container is supported using custom scripts

Oracle Exadata Support

Actifio supports the following configurations of Oracle Exadata starting from VDP 8.1.0 and above.

- Exadata Database Machine versions: X4 and higher
- Oracle versions: 11g, 12c, 18c and 19c

Note: Actifio support is limited to Exadata machines running Oracle Enterprise Linux version 6.0 and above.

Supported Data Capture And Data Presentation Methods

Actifio supports a variety of capture and presentation methods for Oracle databases under various configurations. This includes backup, recovery and App aware mount operations of Oracle database with TDE (Transparent Data Encryption). For Oracle databases with TDE, the wallet for TDE can be captured by setting the Oracle Configuration file location advanced setting for the Oracle app. App aware mounts for TDE enabled databases requires the wallet to be copied to the appropriate location on the mount host.

Note: Recovery of Oracle data captured from a Big endian machine onto a Little endian machine and vice versa are not supported.

Also note that dNFS with Oracle is supported on Linux operating systems.

Table 7:

Production DB Configuration	Capture Format ¹	Presentation Format ²
DB files on ASM/ RAC	Filesystem (Block Device)	Standalone Filesystem
	Filesystem (NFS)	Standalone Filesystem (NFS)
	Filesystem (NFS)	RAC Filesystem (NFS)
	ASM Disk Group ^{3,5}	Standalone ASM
	ASM Disk Group ^{3,6}	ASM RAC (one or more nodes)
DB files on filesystem	Filesystem (Block Device)	Standalone Filesystem
	Filesystem (NFS)	Standalone Filesystem (NFS)
	ASM Disk Group ^{3,4,5}	Standalone ASM
	ASM Disk Group ^{3,4,6}	ASM RAC (one or more nodes)

1 Capture Format is the resulting format of the copy managed by Actifio.

2 App aware mounts of Oracle 12c PDB backup images to Windows hosts is not supported.

3 Capture from ASM to ASM and presentation of backups in ASM format not supported on Windows operating systems

4 Oracle ASM instance required on the source system for this capture method

5 The combination of ASM Disk (capture format) and Standalone ASM (presentation format) is not supported when data is captured over NFS

6 The combination of ASM Disk (capture format) and ASM RAC (presentation format) is not supported when data is captured over NFS

Table 8: Supported Data Capture and Presentation Methods for Oracle Exadata

Supported Data Capture formats	Using File System Using ASM Disk Group
Backup support	HCC or Non HCC Data
Traditional Recovery using RMAN	HCC or non HCC
App-Aware Mount ¹	Exadata to Exadata Exadata to non Exadata

¹ Accessing data from virtual copies of HCC compressed data will require the data to be uncompressed before access

IBM Db2

With VDP 9.0.3 release, Actifio enhanced its out-of-the-box support for data management of IBM Db2 database applications and supports the following data capture methods:

- Db2 on Linux can be captured at the volume level in an incremental-forever fashion with instant access and virtual clone creation for Test Data Management (TDM). This leverages Linux LVM and Actifio's Changed Block Tracking capabilities and is the recommended alternative.
- For customers not using LVM or who cannot use volume level capture, Db2 on Linux can alternatively be captured using full + incremental backup. This uses the database's traditional dump-based backup and typically runs as a weekly full and daily incremental. Recovery involves reconstructing the incrementals on top of the latest full backup.

Table 9:

Database	Supported Versions	Min Required Connector Version
Db2	10.5, 11.1, 11.5	V10.0.1

SAP

Actifio supports SAP on all the databases covered/supported in this document.

SAP HANA

Actifio connector supports capturing SAP HANA in the following configurations.

Table 10:

Supported Configuration	Supported Capture Mode		Min Required Connector Version
	SAP HANA SavePoint API ²	SAP HANA (HDBSQL/Backint) ³	
Scale-out HANA 2.0, non shared storage	Yes (Preferred) ¹	Yes	V10.0.1

Table 10:

Supported Configuration	Supported Capture Mode		Min Required Connector Version
	SAP HANA SavePoint API ²	SAP HANA (HDBSQL/Backint) ³	
Scale-out HANA 2.0, shared storage ⁴	Not Supported	Yes	V10.0.1
SAP HANA 2.0 Standalone or HA (1+1)	Yes (Preferred) ¹	Yes	V10.0.1
Single Container System (HANA 1.0) ⁵	Yes (Preferred)	Yes	V10.0.1

1 Requires SAP HANA 2.0 SPS 04 or above

2 SAP HANA SavePoint API leverages Actifio CBT and supports incremental-forever and app-aware instant mount feature with log roll forward option. Actifio supports CBT with HANA on RHEL 7.2 and above & SLES 11 SP3 and above. For a full list of CBT qualified RHEL & SLES versions see [Linux Operating System Support](#).

3 SAP HANA Backint mode only supports weekly full with daily incrementals. Supports traditional recovery using HANA HDBSQL/Backint commands. Also App-aware instant mount capability is not supported with HANA File-based (HDBSQL/Backint) API

4 Supports only Actifio NFS disk mapping option. NFS disk is always mapped to all HANA nodes

5 Supports both Actifio block and NFS disk mapping options

Note: HANA log backup is integrated with database backup policies and is handled automatically in all above configurations.

SAP HANA – Supported Operating Systems & Architectures

Below table captures VDP support for SAP HANA supported operating systems on different architectures.

Table 11:

OS	Supported Backup Type	
	HANA Storage Snapshot API (Leverages Actifio CBT) ¹	HANA File-based (HDBSQL) API ²
RHEL	RHEL 7.2 or later ¹	RHEL 7.2 or later ²
SLES	SLES 11 SP3 or later ¹	SLES 11 SP3 or later ²

1 For the full list of CBT qualified RHEL & SLES versions and minimum required VDP versions, see [Linux Operating System Support](#).

2 For Non-CBT qualified RHEL & SLES versions, see [Linux Operating System Support](#).

SAP ASE (formerly Sybase ASE)

With VDP 9.0.3 release, Actifio enhanced its out-of-the-box support for data management of SAP ASE database applications and supports the following data capture methods:

- SAP ASE on Linux can be captured at the volume level in an incremental-forever fashion with instant access and virtual clone creation for TDM. This leverages Linux LVM and Actifio's Changed Block Tracking capabilities and is the recommended alternative.
- For customers not using LVM or who cannot use volume level capture, SAP ASE on Linux can alternatively be captured using full + incremental backup. This uses the database's traditional dump-based backup and typically runs as a weekly full and daily incremental. Recovery involves reconstructing the incrementals on top of the latest full backup.

Table 12:

Database	Supported Versions	Min Required Connector Version
SAP ASE	15.7, 16.0.x	VI0.0.1

MySQL

With VDP 9.0.4 release, Actifio enhanced its out-of-the-box support for data management of MySQL database applications and supports the following data capture methods:

- MySQL on Linux can be captured at the volume level in an incremental-forever fashion with instant access and virtual clone creation for TDM. This leverages Linux LVM and Actifio's Changed Block Tracking capabilities and is the recommended alternative.
- For customers not using LVM or who cannot use volume level capture, MySQL on Linux can alternatively be captured using full + incremental backup. This uses the database's traditional dump-based backup and typically runs as a weekly full and daily incremental. Recovery involves reconstructing the incrementals on top of the latest full backup.

Table 13:

Database	Supported Versions	Min Required Connector Version
MySQL	5.7, 8.0	VI0.0.1

MariaDB

VDP 10.0.0 release provides enhanced out-of-the-box support for data management of MariaDB database applications and supports the following data capture methods:

- MariaDB on Linux can be captured at the volume level in an incremental-forever fashion with instant access and virtual clone creation for TDM. This leverages Linux LVM and VDP Changed Block Tracking capabilities and is the recommended alternative.
- For customers not using LVM or who cannot use volume level capture, MariaDB on Linux can alternatively be captured using full + incremental backup. This uses the database's traditional dump-based backup and typically runs as a weekly full and daily incremental. Recovery involves reconstructing the incrementals on top of the latest full backup.

Table 14:

Database	Supported Versions	Min Required Connector Version
MariaDB	10.3.9	VI0.0.1

SAP IQ (formerly Sybase IQ)

VDP 10.0.0 release provided enhanced out-of-the-box support for data management of SAP IQ database applications using full + incremental capture method using the database's traditional dump-based backup, typically as a weekly full and daily incremental. Recovery involves reconstructing the incrementals on top of the latest full backup.

With 10.0.1 release, VDP supports capturing SAP IQ at the volume level in an incremental-forever fashion with instant access and virtual clone creation for TDM. This leverages Linux LVM and VDP Changed Block Tracking capabilities and is the recommended alternative.

Table 15:

Database	Supported Versions	Min Required Connector Version
SAP IQ (Full + Incremental)	16.x	V10.0.1
SAP IQ (LVM + CBT) 1	16.x	V10.0.1

SAP MaxDB

VDP 10.0.1 release provides enhanced out-of-the-box support for data management of SAP MaxDB database applications and supports the following data capture methods:

- SAP MaxDB on Linux can be captured at the volume level in an incremental-forever fashion with instant access and virtual clone creation for TDM. This leverages Linux LVM and VDP Changed Block Tracking capabilities and is the recommended alternative.
- For customers not using LVM or who cannot use volume level capture, MaxDB on Linux can alternatively be captured using full + incremental backup. This uses the database's traditional dump-based backup and typically runs as a weekly full and daily incremental. Recovery involves reconstructing the incrementals on top of the latest full backup.

Table 16:

Database	Supported Versions	Min Required Connector Version
MaxDB	7.9	V10.0.1

PostgreSQL

With VDP 10.0.2 release, Actifio enhanced its out-of-the-box support for data management of PostgreSQL database applications and supports the following data capture methods:

- PostgreSQL on Linux can be captured at the volume level in an incremental-forever fashion with instant access and virtual clone creation for TDM. This leverages Linux LVM and Actifio's Changed Block Tracking capabilities and is the recommended alternative.
- For customers not using LVM or who cannot use volume level capture, PostgreSQL on Linux can alternatively be captured using full + incremental backup. This uses the database's traditional dump-based backup and typically runs as a weekly full and daily incremental. Recovery involves reconstructing the incrementals on top of the latest full backup.

Table 17:

Database	Supported Versions	Min Required Connector Version
PostgreSQL	9.6.x, 10.x, 11.x & 12.x	V10.0.2

MongoDB

With VDP 10.0.0 release, Actifio supports the following versions of MongoDB.

Table 18:

Database	Supported Versions	Min Required Connector Version
MongoDB	3.4.x to 4.2.x	V10.0.0

Note: MongoDB support is limited to replica set based configurations only. MongoDB clusters in sharded configuration are not supported. Support for MongoDB is provided through a generic application framework and requires manual discovery of MongoDB database and configuration of pre/post scripts

File Systems

Actifio connectors discover each volume/network mount point as a protectable application. For each of these discovered applications, Actifio connector orchestrates the process of achieving consistency (through VSS/LVM snapshots), presents a staging disk which will be formatted with a file system of the same type as source or a compatible file system type as documented below.

Table 19:

Operating System	Source FS	Staging Disk FS	Min Required Connector Version
Windows	NTFS	NTFS	V10.0.1
	CIFS	NTFS	V10.0.1
	ReFS	ReFS	V10.0.1
Linux ¹	EXT2	EXT2 or NFS ⁴	V10.0.1
	EXT3	EXT3 or NFS ⁴	V10.0.1
	EXT4	EXT4 or NFS ⁴	V10.0.1
	XFS	XFS or NFS ⁴	V10.0.1
	ReiserFS	ReiserFS or NFS ⁴	V10.0.1
	NFS	EXT3 or NFS ⁴	V10.0.1
	BTRFS	EXT3 or NFS ⁴	V10.0.2

1 LVM snapshot is used as source, if present. LVM mount back to same server is supported

2 Built in versions only

3 Encryption not supported

4 Only V3 of NFS protocol is supported

Test Data Management with Containers

Actifio VDP 10.0.1 leverages Kubernetes NFS volumes to make application data captured with VDP available as NFS shares to containers. This allows for creating virtual clones of supported databases that's easily accessible from within the containerized environment.

Note: Only MySQL and PostgreSQL databases on supported Linux OS are eligible for Test Data Management with containers.

Data Virtualization for Virtual Environments

VMware

Actifio supports capturing data from VMware virtual machines by leveraging VMware APIs for data protection (VADP) calls to capture an entire virtual server. Specifically, the API calls can:

- Perform change block tracking: Makes an initial full snapshot of a database, then going forward only snapshots the changes to the database thereby enabling Actifio's incremental forever capture strategy.
- Quiesce applications: Ensures application consistency during capture.

Note: Protection of VMware View virtual machines not supported

Table 20:

vCenter	7.0 ⁹ , 7.0 U1 ⁹ , 7.0 U2 ⁹
Server	7.0, 7.0 U1
Virtual Hardware	7 to 13 ⁷ , 14 ⁷ , 15 ⁷ and 17 ⁷ , 18 ⁷ , 19 ⁷
Guest OS	All VMware supported OSs
Quiesce applications ⁵	Yes, based on VMware Tools
vSAN Support ^{3,8}	vSAN 6.0-6.6, vSAN 6.7, vSAN 6.7 U1, vSAN 6.7 U2 ¹⁰ & U3, vSAN 7.0 U1, vSAN 7.0 U2
Change Block Tracking ⁶	Leverages VMware VADP API

1 Minimum version of ESX required is 6.0 Update 1 with a build number 3247720

2 vSphere/ESX 6.0 u3 requires Actifio software version 7.0.3 or higher

3 vSAN 6.0-6.6 requires a minimum Actifio Sky version 7.0.2

4 Actifio connector not required for Out Of Band capture

5 Capability applicable to any application with a VSS Writer or pre/post scripts to achieve application consistent capture.

6 Not supported for disks presented to production VM's as pRDM

7 NVME Controller types (found on ESX 6.5 and above) are not supported. Virtual hardware version 14 and above are supported only with ESX 6.7 U2 (and above)

8 Since VMware vSAN does not support RDM device access features, mounting of a VM is not supported by Actifio when using RDMs. Restores and Clones of VMs are supported. However, mounting of a VM is supported on Actifio Sky when using NFS transport instead of RDM.

9 Leverages VMware VDDK version 6.7.3

Orchestrated Disaster Recovery

Actifio GO supports Disaster Recovery orchestration for these workloads.

Table 21:

Supported Application Type for DR	Source	Destination
GCE Virtual Machines ¹	GCE	GCE
Databases ²	GCP	GCE, GCVE

1 Orchestrated recoveries are supported through PowerShell script that initiates recoveries of VMs specified in a CSV file.

2 Leverages Actifio Resiliency Director. Databases are recovered using mount operations.