

Backup & Recovery in CloudStack

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About me

Apache CloudStack Contributor.

Cloud Architect @ ShapeBlue.

Ex – Support Manager, Support Engineer at Accelerite, Citrix for CloudPlatform.



Jithin Raju



Overview

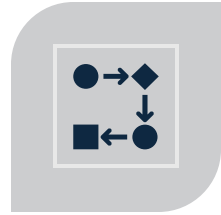
- Instance Snapshots
- Volume Snapshots
- Backup & Recovery Framework
- Backup & Recovery Providers
- B&R Provider – Veeam
- B&R Provider – Dell NetWorker
- B&R Provider – BackROLL
- B&R Provider – NAS
- My Wishlist of Improvements
- Q&A
- References



Instance Snapshots



STATE OF AN INSTANCE
AT A SPECIFIC POINT IN
TIME.



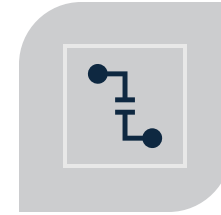
QUICK – CREATION AND
RECOVERY.



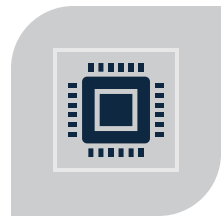
SAME LOCATION AS THE
SOURCE INSTANCE.



DEPENDENT ON THE
SOURCE INSTANCE.



SUPPORTED WITH KVM,
XENSERVER/XCP-NG,
AND VMWARE.



GOOD FOR DEV, TEST,
UPDATES, ERRORS, ETC.

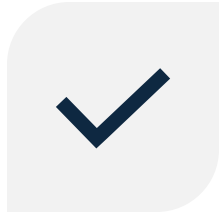


HIGH STORAGE
CONSUMPTION ON
PRIMARY STORAGE.



NOT A REPLACEMENT
FOR BACKUP.

Volume Snapshots



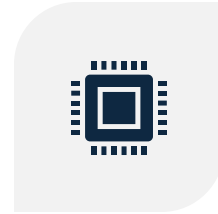
RELIABLE FEATURE IN
ACS.



NOT STORED AT THE
SOURCE—COPIED TO
SECONDARY STORAGE.



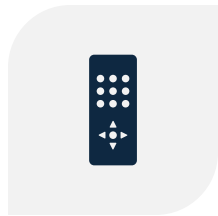
NOT DEPENDENT ON THE
SOURCE INSTANCE.



FULL (KVM*, VMWARE)
AND INCREMENTAL
(XENSERVER/XCP-NG).



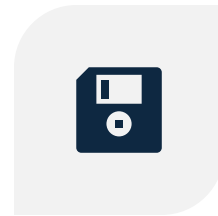
LONGER RETENTION.



REMOTE ZONE COPIES.



SLOW RECOVERY.



VOLUME BACKUPS AT
DIFFERENT TIMES WITHIN
EACH INSTANCE.

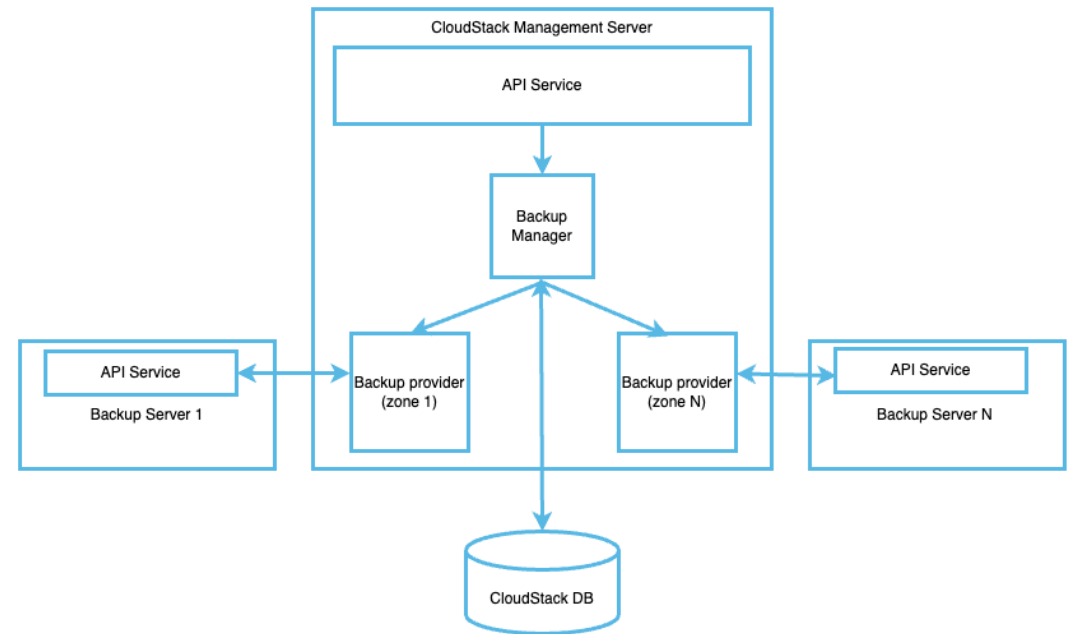
Backup & Recovery Framework

Apache CloudStack release 4.14 onwards

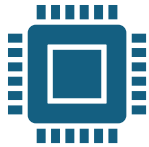
Flexible Framework: Enables backing up Guest Instances for recovery.

API Abstraction: Simplifies common backup/recovery operations.

Plugin Model: Integrates various backup solutions seamlessly.



Backup & Recovery Framework



Supported Providers:

VMware: Veeam Backup and Replication

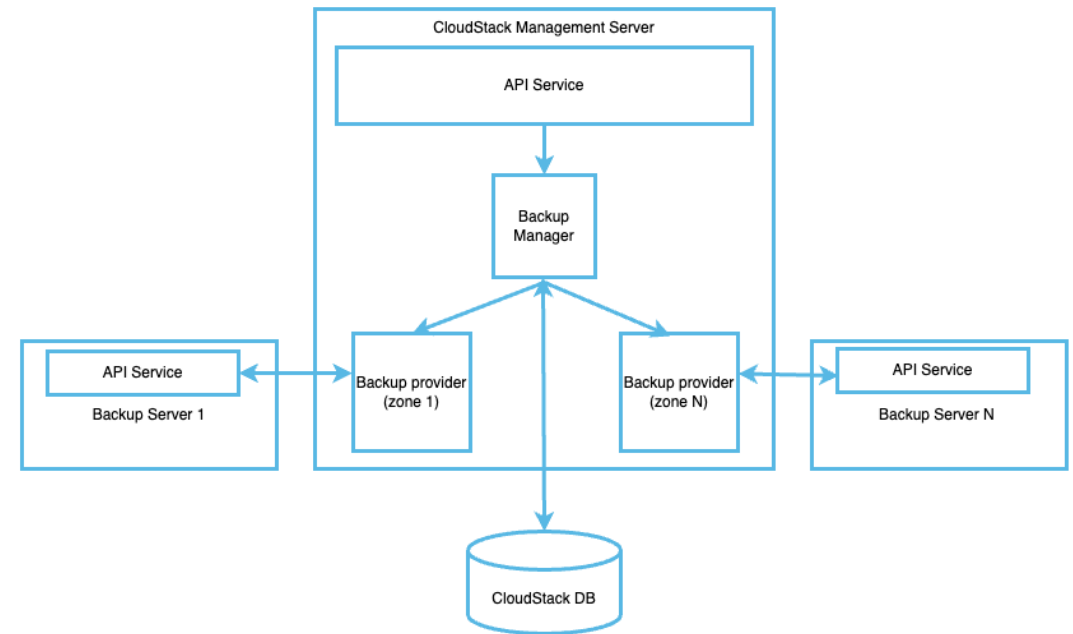
KVM:

- DELL NetWorker.
- BackROLL*
- NAS B&R Plugin (from 4.20).



Key Benefits:

- Enhanced data protection.
- Flexible integration with third-party solutions.
- Streamlined recovery processes.



Backup & Recovery Framework



Assign Instance to backup offering

Create Adhoc Backup

Backup Schedules

SLA based Backups

Restore Instance

Restore a volume and attach it to another instance

Delete Backups

Usage

myappserver1 **Import backup offering** ? ×

FULL

Status
● BackedUp

* Name ⓘ
MyFilerBackups

* Description ⓘ
MyFilerBackups on NFS storage

* Zone ⓘ
London-city

* External Id ⓘ
MyBackupRepo

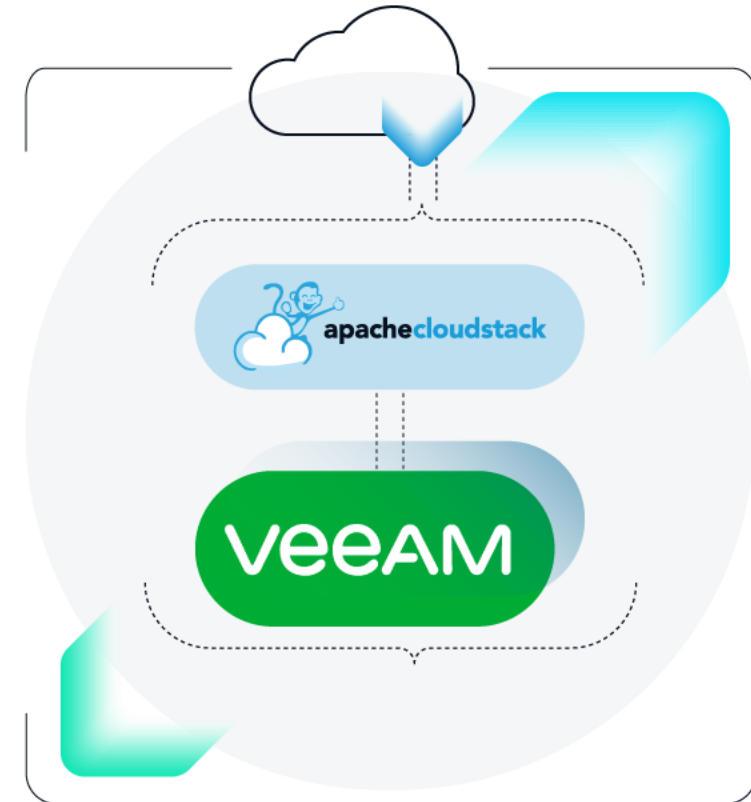
Allow User driven backups ⓘ

Cancel OK



B&R Provider – Veeam Backup & Replication

Veeam Backup & Replication 11,12.	VMware vSphere only	Requires the Veeam Backup enterprise manager for API access.
Full and Incremental	Running or Stopped Instances.	Template jobs -> Backup Offering
Veeam Enterprise Manager + Veeam API + PowerShell	Many storage options	Can't delete individual backups*



B&R Provider – Dell NetWorker

Dell NetWorker 19.4.0.6*

KVM only.

Full backups only.

Policies*** -> Backup Offering

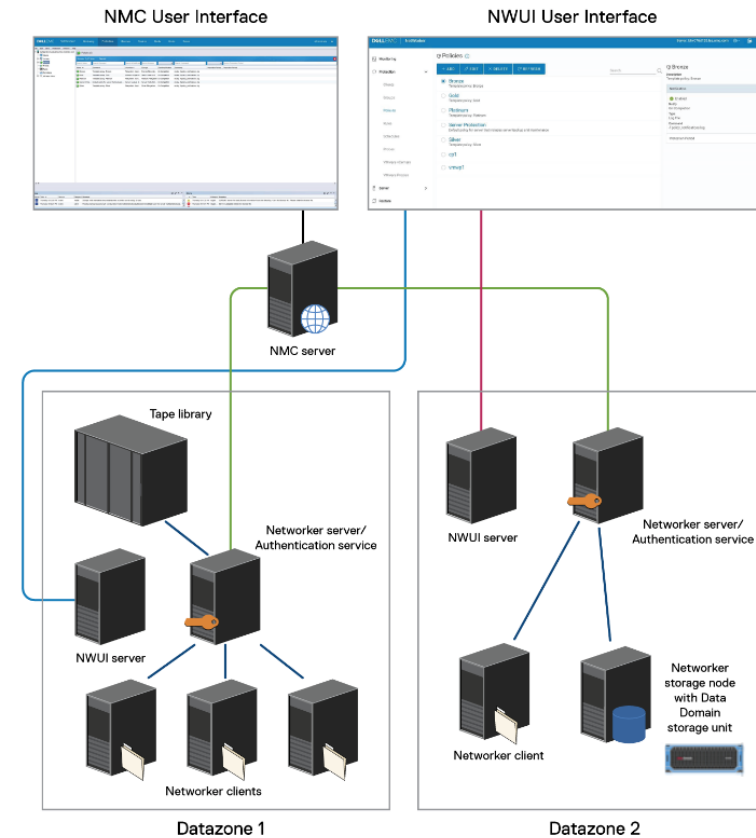
Multiple storage options.

Client on KVM hosts, Cluster as well.

Requires QEMU guest agent

No trial, free versions are available.

No support for stopped instances.



B&R Provider – BackROLL

BackROLL v0.4.0-alpha-1*

Open-source. Apache v2.

KVM only.

Full and Incremental Backups.

Running or Stopped instances.

Policies -> Backup Offering.

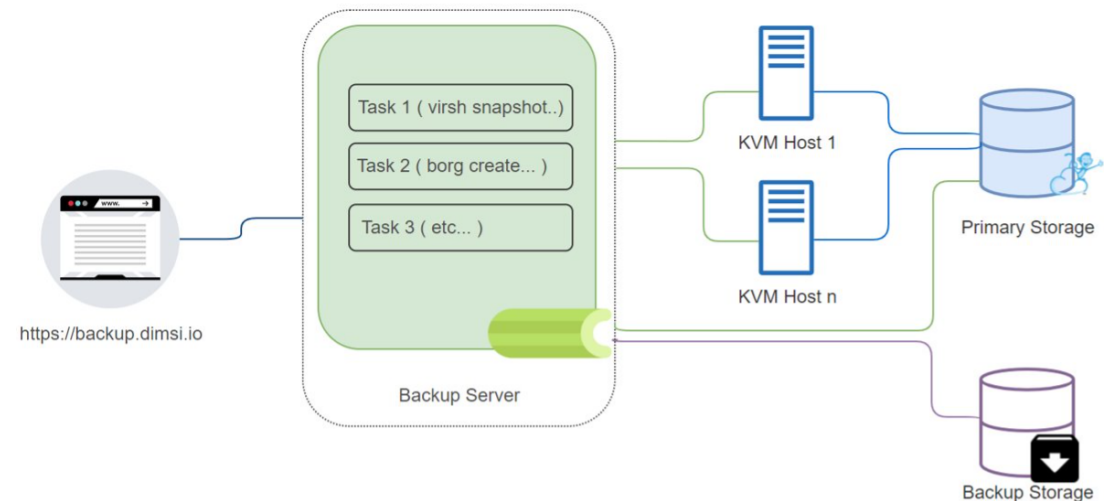
Multiple storage options**.

No agent on guests or KVM hosts. QEMU guest agent expected

Fully containerized.

Quick deployment. Docker-compose.

Plugin PR #8251 merge in progress



B&R Provider – NAS

Introduced in Apache Cloudstack 4.20

Native CloudStack B&R provider.

KVM only. Running/Stopped Instances.

EL8, Ubuntu 22.04 and above.

Full Backups, for now. Incremental can be supported.

Backup volumes and domain XML.

Backup Repository -> Backup Offering.

```
# Start push backup
virsh -c qemu:///system
backup-begin --domain $VM
--backupxml $dest/backup.xml > /dev
/null 2>/dev/null
```

```
qemu-img convert -O qcow2 $disk
$dest/$name.$volUuid.qcow2
```



B&R Provider – NAS

- Backup Repository: NFS, CIFS (PR #9666).
- Relies on the KVM agent.
- Backup from any supported Primary Storage.
- Restore is limited to NFS and local Primary storage.
- Quick deployment.
- Limited performance and functionalities.



🏠 / Backup Repository / MyBackupRepo ⓘ 🔄 Refresh



MyBackupRepo

nfs

ID

 [775e371b-2d9a-46a0-8578-f78f6da9c760](#)

Zone

 [London](#)

Created

 17 Oct 2024 09:55:25

Name

MyBackupRepo

Type

nfs

Address

mystorage/mycloudbackup

Zone

London

My Wishlist of improvements

B&R Framework:

- Support for Resource Limits.
- Restoration of Expunged Instances.
- Restoration of Unmanaged Instances.
- Support for more B&R solutions.
- Backup and Restoration to Remote Zones.
- Multiple B&R providers per Zone.
- Support for XenServer/XCP-ng.
- Backup to Object Storage.
- Default backup policy enforced at Domain or Project.
- Restoration of files and directories in a guest Instance.



My Wishlist of improvements

NAS:

- Support for Cephfs as a Backup Repository.
- Incremental Backups.
- Restore support for more Primary storage types.
- Restoration of files and directories in a guest Instance.
- Mount Backup Volumes to any instance as read-only.



Q&A



References

https://docs.cloudstack.apache.org/en/latest/adminguide/backup_and_recovery.html
<https://www.veeam.com/products/veeam-data-platform.html?ad=menu-products-portfolio>
https://docs.cloudstack.apache.org/en/latest/adminguide/networker_plugin.html#dell-emc-networker-backup-and-recovery-plugin
<https://github.com/apache/cloudstack/pull/6550>
<https://nsrd.info/blog/category/networker/>
<https://github.com/apache/cloudstack/pull/8251>
<https://github.com/DIMSI-IS/BackROLL/blob/v.0.3.0/README.md>
<https://backroll.readthedocs.io/en/latest/introduction/architecture.html>
https://docs.cloudstack.apache.org/en/latest/adminguide/nas_plugin.html#nas-backup-and-recovery-plugin
<https://github.com/apache/cloudstack/pull/9451>
<https://github.com/apache/cloudstack/pull/9666>



Thank you!

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@CloudStack

