



Automating VM Backup on the Oracle Private Cloud Appliance X9-2

Oracle Private Cloud Appliance

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PURPOSE STATEMENT

The document summarizes how customers can utilize a series of bash scripts to enable VM Backup on the Oracle Private Cloud Appliance. VM Backup capabilities are available upon upgrading to Oracle Private Cloud Appliance Software Release 3.0.2.

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INTRODUCTION

Oracle Private Cloud Appliance (PCA) is uniquely compatible with OCI providing fast and efficient infrastructure for modern software and business applications. Oracle Private Cloud Appliance has the same infrastructure constructs (including APIs and SDKs) as OCI. This enables customers to adopt a “develop once and deploy anywhere—on-premises or on OCI” approach to rapidly design and develop high-performance applications and middleware.

SCOPE AND CONTENT

This document provides customers with multiple ways in which customer can use bash scripts to enable VM Backup on Oracle Private Cloud Appliance, transfer the backup to another object store and restore from the backup on an Oracle Private Cloud Appliance.

ADVANTAGES OF ORACLE PRIVATE CLOUD APPLIANCE

Oracle Private Cloud Appliance (PCA) is an Oracle Engineered System designed for implementing the application and middleware tiers. PCA is an integrated hardware and software system that reduces infrastructure complexity and deployment time for virtualized workloads in private clouds. It is a complete platform that provides optimal performance for a wide range of application types and workloads, with built-in management, compute, storage, and networking resources.

Oracle Private Cloud Appliance is the latest member of the Oracle Private Cloud Appliance product family. PCA provides cloud and administrative services for modernized cloud native applications. It makes use of a modern microservices architecture, Kubernetes, and related technologies, for a future-proofed software stack.

Oracle Private Cloud Appliance delivers private cloud infrastructure and architecture consistent with Oracle Cloud Infrastructure (OCI). PCA brings APIs and SDKs compatible with Oracle Cloud Infrastructure (OCI) to an on-premises implementation at rack scale, making workloads, user experience, tool sets, and skills portable between private and public clouds. PCA can be directly connected to Oracle Exadata to create an ideal infrastructure for scalable, multitier applications. Customers preferring or requiring an on-premises solution can realize the operational benefits of public cloud deployments using Oracle Private Cloud Appliance.

VM BACKUP ON THE ORACLE PRIVATE CLOUD APPLIANCE

Oracle Private Cloud Appliance offers customers the capability to backup and restore VM instances. The instance backup is created in an Oracle Private Cloud Appliance Object Storage Bucket where a customer can choose to either copy the backup to another server or object store in the customer datacenter. When required, a customer can import the backup into any Oracle Private Cloud Appliance Object Storage Bucket and restore the VM.

AUTOMATING OFF SYSTEM BACKUP METHODS

A customer can utilize the sample bash scripts as below to automate the full workflow of Off System Backup:

Note:

- The bash script in this post is structured for Linux. If you are trying to follow this post on Windows, you will need to modify escape sequences and possibly some commands
- Fill bash script with your values and as per your environment as below added are sample scripts for how off system backup feature can be automated
 - Users can also put in required profile/value in a separate script instead of individual script as below are just sample scripts
 - Object Store bucket has to be pre-created for the off-system backup scripts

Single Instance Backup

```
#!/bin/bash
##### Fill these in with your values #####
#OCID of the tenancy calls are being made in to
tenancy_ocid="ocid1.tenancy.XXXX.XXXX.gidclawftnq3vo572t4cb46tmqxmlg4aivv7ttoa1a7y0mibcak00090146"

# OCID of the user making the rest call
user_ocid="ocid1.user.XXXX.XXXX.zknu1e9y13efvmmpu6doo8arto2eogrds6abbx0zdsygaz9qglksdqqxql0m"

# path to the private PEM format key for this user
privateKeyPath="/home/sampleuser/.oci/oci_api_key.pem"

# fingerprint of the private key for this user
fingerprint="99:aa:....."

# The REST api you want to call, with any required parameters.
rest_api="/20160918/instances"

# The PCA you want to make the call against example iaas.<pcaname>.domainname>
host="iaas.pca.oraclecloud..."

# The Instance ID for backup
instance_id="/ocid1.instance.XXXX.XXXX.7kh649y8kd9kgxcmidbmdhnj1eh0ukb3gnd5ejvxm85f7ybm1o2qtrk0p91g"
```

```

# Export action for backup
rest_action="/actions/export"

#Object Store data for export
objectstore_payload="{\"bucketName\": \"Image\", \"destinationType\": \"objectStorageTuple\",
\"namespaceName\": \"backup_tenant\", \"compartmentId\": \"${tenancy_ocid}\"}"

#data load for token gathering
data_login="{\"username\": \"admin\", \"password\": \"XXXXXX\", \"tenancy\":
\"backup_tenant\"}"

# Get login tokens
TOKEN=$(curl --noproxy "*" -k -X POST --header "Content-Type: application/json" -d
"$data_login" -sS https://$host/20160918/login | grep token | awk '{print $2}' | sed -E
's/(^.)|(..$)//g')

# Export the Instance
echo
"=====
set -x
curl --noproxy "*" -k -H "AUTHORIZATION: Bearer $TOKEN" -X POST --data "$objectstore_payload"
-sS https://$host$rest_api$instance_id$rest_action

```

Multiple Instance Backup

```
#!/bin/bash
##### Fill these in with your values #####
#OCID of the tenancy calls are being made in to
tenancy_ocid="ocid1.tenancy.XXXX.XXXX.gidclawftnq3vo572t4cb46tmqmalg4aivv7ttoa1a7y0mibcak0009
0146"

# OCID of the user making the rest call
user_ocid="ocid1.user.XXXX.XXXX.zknu1e9y13efvmmpu6doo8arto2eogrds6abbx0zdsygz9qglksdqxxql0m"

# path to the private PEM format key for this user
privateKeyPath="/home/sampleuser/.oci/oci_api_key.pem"

# fingerprint of the private key for this user
fingerprint="99:aa:....."

# The REST api you want to call, with any required parameters.
rest_api="/20160918/instances"

# The PCA you want to make the call against example iaas.<pcaname>.<domainname>
host="iaas.pca.oraclecloud..."

# Multiple Instance ID for backup with space between the instance id
instance_id_list="/ocid1.instance.XXXX.XXXX.7kh649y8kd9kgxcmidbmdhnj1eh0ukb3gnd5ejvxn85f7ybm1o
2qtrk0p91g
/ocid1.instance.XXXX.XXXX.bjzzv4oks8iiu2zreked515ff529bzug9nq9w6cvdv14ygbr7kx4v778nx78"

# Export action for backup
rest_action="/actions/export"

#Object Store data for export
objectstore_payload="{\"bucketName\": \"Image\", \"destinationType\": \"objectStorageTuple\",
\"namespaceName\": \"backup_tenant\", \"compartmentId\": \"${tenancy_ocid}\"}"

#data load for token gathering
data_login="{\"username\": \"admin\", \"password\": \"XXXXXX\", \"tenancy\":
\"backup_tenant\"}"
```

```

# Get login tokens
TOKEN=$(curl --noproxy "*" -k -X POST --header "Content-Type: application/json" -d
"$data_login" -sS https://$host/20160918/login | grep token | awk '{print $2}' | sed -E
's/^(^.)|(..$)//g')

# Export Multiple Instances
echo
"=====
set -x
for instance_id in $instance_id_list
do
    echo "Exporting $instance"
    set -x
    curl --noproxy "*" -k -H "AUTHORIZATION: Bearer $TOKEN" -X POST --data
"$objectstore_payload" -sS https://$host$rest_api$instance_id$rest_action
done

```

List All Backups

```

#!/bin/bash
##### Fill these in with your values #####
#OCID of the tenancy calls are being made in to
tenancy_ocid="ocid1.tenancy.XXXX.XXXX.gidclawftnq3vo572t4cb46tmqxmlg4aivv7ttoa1a7y0mibcak0009
0146"

# OCID of the user making the rest call
user_ocid="ocid1.user.XXXX.XXXX.zknu1e9y13efvmpu6doo8arto2eogrds6abbx0zdsygaz9qglksdqxxql0m"

# path to the private PEM format key for this user
privateKeyPath="/home/sampleuser/.oci/oci_api_key.pem"

# fingerprint of the private key for this user
fingerprint="99:aa:....."

# The REST api you want to call, with any required parameters.
rest_api="/20160918/instanceBackups"

# The PCA you want to make the call against example iaas.<pca name>.<domain name>
host="iaas.pca.oraclecloud..."

```



```

#data load for token gathering
data_login="{\"username\": \"admin\", \"password\": \"XXXXX\", \"tenancy\":
\"backup_tenant\"}"

# Get login tokens
TOKEN=$(curl --noproxy "*" -k -X POST --header "Content-Type: application/json" -d
"$data_login" -sS https://$host/20160918/login | grep token | awk '{print $2}' | sed -E
's/(^.)|(..$)//g')

# List All the Instance backup
echo
"=====
set -x
curl --noproxy "*" -k -H "AUTHORIZATION: Bearer $TOKEN" -X GET -sS
https://$host$rest_api?compartmentId=$tenancy_ocid

```

Get backups

```

#!/bin/bash
##### Fill these in with your values #####
#OCID of the tenancy calls are being made in to
tenancy_ocid="ocid1.tenancy.XXXX.XXXX.gidclawftnq3vo572t4cb46tmqxmlg4aivv7ttoa1a7y0mibcak0009
0146"

# OCID of the user making the rest call
user_ocid="ocid1.user.XXXX.XXX.zknu1e9y13efvmmpu6doo8arto2eogrds6abbx0zdsygaz9qglksdqxxql0m"

# path to the private PEM format key for this user
privateKeyPath="/home/sampleuser/.oci/oci_api_key.pem"

# fingerprint of the private key for this user
fingerprint="99:aa:....."

# The REST api you want to call, with any required parameters.
rest_api="/20160918/instanceBackups"

# The PCA you want to make the call against example iaas.<pca name>.<domain name>
host="iaas.pca.oraclecloud..."

#exported instance id

```

```

export_instance_id="/ocid1.exportinstance.XXXX.XXXX.loikk3scba58td7dkljmna1moztqo7ucikr45n9bx
6s6kgzp2do5b559614
/ocid1.exportinstance.XXXX.XXXX.loikk3scba58td7dkljmna1moztqo7ucikr45n9bx6s6kgzp2do5b559614"

#data load for token gathering
dataloadlogin="{\"username\": \"admin\", \"password\": \"XXXX\", \"tenancy\":
\"backup_tenant\"}"

# Get login tokens
TOKEN=$(curl --noproxy "*" -k -X POST --header "Content-Type: application/json" -d
"$dataloadlogin" -sS https://$host/20160918/login | grep token | awk '{print $2}' | sed -E
's/(^.)|(..$)//g')

# Get the Instance backup
echo
"=====
for export_id in $export_instance_id
do
    echo "Get $export_id details"
    set -x
    curl --noproxy "*" -k -H "AUTHORIZATION: Bearer $TOKEN" -X GET -sS
https://$host$rest_api$export_id

```

Single Instance Restore

```

#!/bin/bash
##### Fill these in with your values #####
#OCID of the tenancy calls are being made in to
tenancy_ocid="ocid1.tenancy.XXXX.XXXX.gidclawftnq3vo572t4cb46tmqxmalg4aivv7tto1a7y0mibcak0009
0146"

# OCID of the user making the rest call
user_ocid="ocid1.user.XXXX.XXXX.zknu1e9y13efvmmpu6doo8arto2eogrds6abbx0zdsygaz9qglksdqxxql0m"

# path to the private PEM format key for this user
privateKeyPath="/home/sampleuser/.oci/oci_api_key.pem"

# fingerprint of the private key for this user
fingerprint="99:aa:....."

# The REST api you want to call, with any required parameters.

```

```

rest_api="/20160918/instanceBackups"

# The PCA you want to make the call against example iaas.<pcaname>.<domainname>
host="iaas.pca.oraclecloud..."

# Export action for backup
rest_action="/actions/import"

#exported instance id
exported_instance_id="/ocid1.exportinstance.XXXX.XXXX.uowdqdmy1bw0xsr4tfmmz9srthp9r4ed36esfdz4
ffd5hz9qm2z6hy0431wdv"

#Object Store data for import
objectstore_payload="{\"bucketName\": \"Image\", \"sourceType\": \"objectStorageTuple\",
\"namespaceName\": \"backup_tenant\", \"compartmentId\": \"${tenancy_ocid}\"}"

#data load for token gathering
data_login="{\"username\": \"admin\", \"password\": \"XXXX\", \"tenancy\": \"backup_tenant\"}"

# Get login tokens
TOKEN=$(curl --noproxy "*" -k -X POST --header "Content-Type: application/json" -d
"$data_login" -sS https://$host/20160918/login | grep token | awk '{print $2}' | sed -E
's/(^.)|(.$)//g')

# Importing the Instance
echo
"=====
set -x
curl --noproxy "*" -k -H "AUTHORIZATION: Bearer $TOKEN" -X POST --data "$objectstore_payload"
-sS https://$host$rest_api$exported_instance_id$rest_action

```

Multiple Instance Restore

```
#!/bin/bash
##### Fill these in with your values #####
#OCID of the tenancy calls are being made in to
tenancy_ocid="ocid1.tenancy.XXXX.XXXX.gidclawftnq3vo572t4cb46tmqxmalg4aivv7ttoa1a7y0mibcak0009
0146"
# OCID of the user making the rest call
user_ocid="ocid1.user.XXXX.XXXX.zknu1e9y13efvmmpu6doo8arto2eogrds6abbx0zdsygz9qglksdqxxql0m"
# path to the private PEM format key for this user
privateKeyPath="/home/sampleuser/.oci/oci_api_key.pem"

# fingerprint of the private key for this user
fingerprint="99:aa:....."

# The REST api you want to call, with any required parameters.
rest_api="/20160918/instanceBackups"

# The PCA you want to make the call against example iaas.<pcaname>.<domainname>
host="iaas.pca.oraclecloud..."

# Export action for backup
rest_action="/actions/import"

#exported backup id for backup with space between the backup id
backup_list_id="/ocid1.exportinstance.XXXX.XXXX.rtzmmjmsee2d5wn6sem4v34zp3zzisyonrrd1sz1224rua
rcd9eof7n9qre7
/ocid1.exportinstance.XXXX.XXXX.5.nmz962biefic3msq7bz5x7agp5g86eeanoe2pbbsdspk1ecotzy0a5ozuk3m
"

#Object Store data for import
objectstore_payload="{\"bucketName\": \"Image\", \"sourceType\": \"objectStorageTuple\",
\"namespaceName\": \"backup_tenant\", \"compartmentId\": \"${tenancy_ocid}\"}"

#data load for token gathering
data_login="{\"username\": \"admin\", \"password\": \"XXXX\", \"tenancy\": \"backup_tenant\"}"
# Get login tokens
TOKEN=$(curl --noproxy "*" -k -X POST --header "Content-Type: application/json" -d
"$data_login" -sS https://$host/20160918/login | grep token | awk '{print $2}' | sed -E
's/(^.)|(..$)//g')
# Importing the Instance
```

```

echo
"=====
set -x
for backup_id in $backup_list_id
do
    echo "Importing $instance"
    set -x
    curl --no-proxy "*" -k -H "AUTHORIZATION: Bearer $TOKEN" -X POST --data
"$objectstore_payload" -sS https://$host$rest_api$backup_id$rest_action
done

```

Deleting the Backups

```

#!/bin/bash
##### Fill these in with your values #####
#OCID of the tenancy calls are being made in to
tenancy_ocid="ocid1.tenancy.XXXX.XXXX.gidclawftnq3vo572t4cb46tmqmalg4aivv7ttoa1a7y0mibcak0009
0146"

# OCID of the user making the rest call
user_ocid="ocid1.user.XXXX.XXXX.zknu1e9y13efvmmmpu6doo8arto2eogrds6abbx0zdsygz9qglksdqxxql0m"

# path to the private PEM format key for this user
privateKeyPath="/home/sampleuser/.oci/oci_api_key.pem"

# fingerprint of the private key for this user
fingerprint="99:aa:....."

# The REST api you want to call, with any required parameters.
rest_api="/20160918/instanceBackups"

# The PCA you want to make the call against example iaas.<pcaname>.<domainname>
host="iaas.pca.oraclecloud..."

#exported instance id
exported_instance_id="/ocid1.exportinstance.XXXX.XXXX.rtzmmjmsee2d5wn6sem4v34zp3zzisyonrrd1sz1
224ruarcd9eof7n9qre7
/ocid1.exportinstance.XXXX.XXXX.rnmz962biefic3msq7bz5x7agp5g86eeanoe2pbbsdspk1ecotzy0a5ozuk3m"

```

```

#data load for token gathering
data_login="{\"username\": \"admin\", \"password\": \"XXXX\", \"tenancy\": \"backup_tenant\"}"

# Get login tokens
TOKEN=$(curl --noproxy "*" -k -X POST --header "Content-Type: application/json" -d
"$data_login" -sS https://$host/20160918/login | grep token | awk '{print $2}' | sed -E
's/(^.)|(..$)//g')

# Delete Multiple Exports
echo
"=====
set -x
for export_id in $exported_instance_id
do
    echo "Deleting $export_id"
    set -x
    curl --noproxy "*" -k -H "AUTHORIZATION: Bearer $TOKEN" -X DELETE -sS
https://$host$rest_api$export_id
done

```

Launching Instance from Restore

For creating as multiple instances from the instance backup, follow these steps:

- Create an instance in the usual fashion. While doing so, perform these actions:
 - For the image source, specify the backup boot volume.
 - If the instance requires access using SSH, ensure that you include an SSH public key.
- (Optional) Attach any block volumes that were included in the instance backup.

```

export cidr_block=<substitute-value-of-cidr_block>
export compartment_id=<substitute-value-of-compartment_id>
export availability_domain=<substitute-value-of-availability_domain>
export image_id=<substitute-value-of-image_id>
export sourcebootvolumeid =<substitute-value-of-sourcebootvolumeid-for-restored-boot-volume>
vcn_id=$(oci network vcn create --cidr-block $cidr_block --compartment-id $compartment_id --
query data.id --raw-output)
subnet_id=$(oci network subnet create --cidr-block $cidr_block --compartment-id
$compartment_id --vcn-id $vcn_id --query data.id --raw-output)
oci compute instance launch --availability-domain $availability_domain --compartment-id
$compartment_id --source-boot-volume-id $sourcebootvolumeid --shape VM.PCAStandard1.Flex --
subnet-id $subnet_id --shape-config '{"ocpus": 1, "memoryInGBs": 16}' --ssh-authorized-keys-
file <SSH Public Key> --wait-for-state RUNNING

```

DOWNLOAD FROM OBJECT STORE

Transferring an Instance Backup

The procedures in this section describe how to transfer an instance backup to another system and how to transfer an instance backup back to any Private Cloud Appliance 3.x.

Transferring an Instance Backup to Another System

You can use this procedure to transfer the instance backup to another system in your data center for safekeeping.

Instance backups are large files. Ensure that you have enough space on your system to store the backup. You can use the `oci os object list` command to display the size of the instance backup. See [Viewing Objects in a Bucket](#).

Using the OCI CLI

- Gather the information that you need to run the command:
 - Bucket name:
 - `oci os bucket list --namespace-name <object_storage_namespace>`
 - Object name:
 - `oci os object list --namespace-name <object_storage_namespace> --bucket-name <backup_object_name>`
- Run this command:

```
oci os object get
--namespace-name <object_storage_namespace>
--bucket-name <bucket_name>
--name <backup_object_name>
--file <instance_backup_pathname_with_filename>
```

Example:

```
oci os object get --namespace-name testnamespace --bucket-name backup --name
ocid1.exportinstance.XXXX.XXXX.1lzndoh06luhko5x5pyb81bba5mt5ncqs5z6uus5oailsa6wji2zkz71cu7
b --file backupFile
```

```
Downloading object [#####] 100%
```

Transferring an Instance Backup from Another System to Private Cloud Appliance

Use this procedure to transfer an instance backup from another system in your data center to an Object Storage bucket in Private Cloud Appliance.

Using the OCI CLI

- Gather the information that you need to run the command:
 - Bucket name:
 - `oci os bucket list --namespace-name <object_storage_namespace>`
 - Object name:
 - `oci os object list --namespace-name <object_storage_namespace> --bucket-name <backup_object_name>`
- Upload the instance backup to an Object Storage bucket in the target appliance.

Use the `oci os object put` command.

Syntax (entered on a single line):

```
oci os object put \
--namespace-name <namespace_name> \
--bucket-name <bucket_name> \
--file <instance_backup_pathname_with_filename>
```

Example:

```
oci os object put --file backupFile --bucket-name targetbucket --namespace-name
testnamespace
```

Upload ID: 5bde0dcd-14d4-442e-af4c-43ffd65b24a9

Split file into 62 parts for upload.

```
Uploading object [#####] 100%
```

```
{
  "etag": "b22a7b46db3203247a9428941ce354d1",
  "last-modified": "2022-10-15T21:33:42",
  "opc-multipart-md5": "WqmyIsJmye0m+LIEbZC+ow== -62"
}
```

RESOURCES

See these reference documents for additional information:

- [Oracle Private Cloud Appliance Release Notes](#)
- [Oracle Systems Blog](#)
- [Object Storage](#)

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