OEDACLI Clone Guest for BaseDB

Introduction to Cloning Guests for Base Database Service

The Base Database Service requires a method to create a guest that replicates an existing guest and rehydrates it with a new identity. This feature is essential for the Exascale-based Base Database Service.

Characteristics of the Exadata Base Database Guest

A Base Database guest has the following characteristics:

- One or more client networks
- Zero or more private RDMA networks
- 2 or more Exascale volumes
- Optional Grid Infrastructure/Clusterware
- Zero or more database homes
- Zero or more databases
- Defined VCPU and memory allocations
- Zero or more additional networks

Cloning a Guest: Sequence of Operations

To clone a guest, the following sequence of operations is required:

1. **Create a Consistent Snapshot**: Create a consistent snapshot of all volumes used by the guest to ensure the cloned guest boots without corruption or data loss. Include the source GCV volume in the set of snapshotted volumes
2. **Recreate the Guest with a New Identity**: Use OEDACLI and vm_maker to recreate the guest with its new identity.

Configuring the New Guest with OEDA and OEDACLI

To configure the new guest, an OEDA configuration file is required, which contains information about the target KVM host. The cloud software ensures that the volumes for the new target guest are attached to the target KVM host.

Using the OEDA configuration file, the cloud software runs the following commands to configure the new guest:

Prerequisites

- The guest's volumes have been snapshotted and attached to the target KVM host (parent in the cli below)
- The OEDA configuration file is available and contains the necessary information about the target KVM host.

Commands for Configuring the New Guest (New attribute type=basedb)

```
load file name=esxmlWithExascale.xml
create guest name=scaqan01dv0303m type=basedb
# The parent KVM host is the target KVM host on which the guest needs to be created.
# It must exist in the above file and the KVM host must have networks that resolve to this name
set PARENT name=sea201512exscs11.sea200qfa01512.adminsea2.oraclevcn.com
set ADMINNET name=scaqan01dv0303m.usdvm.oraclecorp.com IP=10.32.125.6 netmask=255.255.255.128 gateway=10.
32.125.1 vlanid=203
set CLIENTNET name=scaqan01dv0303 gateway=10.32.72.1 VLANID=124 IP=10.32.25.35 NATHOSTNAME=mynathostname
NATIP=12.34.3.12 NATGATEWAY=12.34.3.1
NATVLAN=123
# Krish: Add interface names eth9/10 (Locate cloud defaults) TODO
set VMEM size=256G
set VCPU count=8
save action
merge actions
alter machine storagetype=celldisk volumeprotocol=edv where hostname=scaqan01dv0303m
save action
merge actions
ADD EDVVOLUME DEVICE =/dev/exc/dbvolume-data SERIAL=someserial1 WHERE HOSTNAME = "scaqan01dv0303m"
save action
merge actions
ADD EDVVOLUME DEVICE =/dev/exc/dbvolume-reco SERIAL=someserial2 WHERE HOSTNAME = "scaqan01dv0303m"
save action
merge actions
ADD EDVVOLUME DEVICE =/dev/exc/dbvolume-bits SERIAL=someserial3 WHERE HOSTNAME = "scaqan01dv0303m"
save action
merge actions
ADD EDVVOLUME DEVICE =/dev/exc/dbvolume-extra SERIAL=someserial4 WHERE HOSTNAME = "scaqan01dv0303m"
# Delete and alter any additional EDV volumes as needed
save action
merge actions
# This deploy actions will create the guest and reconfigure
deploy actions
```

Post Guest creation Requirements

- Config file must be saved and contain new guest definition
- Cloned guest will be migrated

Known Issues/Outstanding work with Cloning Guests

The following issues have been identified when cloning guests:

- **User Accounts Not Transferred in OEDA**: When creating a brand new guest, the user accounts present in the source guest are not automatically transferred to the new guest in the OEDA configuration file. However, as long as the user accounts are not modified, the OS disk will retain the `/etc/passwd` file from the source guest.
- **Incompatibility with 19c ASM on EDV Clustered Guests**: This method of creating a new guest is not compatible with 19c ASM on EDV clustered guests. It is only suitable for BaseDB guests.
- **OEDA Error with EDV Volumes**: There is a known issue with OEDA when creating the guest configuration file with EDV volumes for an application guest. Will be resolved in a future transaction
- **vm_maker Flag Requirement**:
  - OEDA will write guest configuration file with element reconfigure with value true:

    ```
    <excVolProtocol>edv</excVolProtocol>
    <guestConfVol>/dev/exc/scaqan21dv0102_cfg_bd4f7ca3f9274f2d9cb6c6ba24432461</guestConfVol>
    <reconfigure>true</reconfigure>
    ```

- OEDA needs to call `vm_maker` with a flag to ensure that the guest configuration volume is attached to the guest and that the guest performs its first boot actions and does not overwrite the volume.

Testing

Manual testing

- Test with an existing guest and recreate with new identity manually

Unit testing

- Test the methods in OEDA, vm_maker and ipconf in SAGE_IMAGING_REGRESS and SAGE_OEDA_REGRESS

Functional testing

- Functional testing requires the following
- Setup an Exascale environment with Exascale virtual cluster
- Setup a BaseDB guest with EDV volumes
- Locate the volumes that make up the BaseDB guest
- Create a new guest with new identity - names, ips
- Align the volume names, with the new guest config
- Call OEDA to create the guest
- Validate that the guest has the new name and ips
- Validate that users, database homes, and file systems match the source guest

Important Caveat: Post-Guest Creation Actions

Please note that the sequence of operations described above using OEDA does not support post-guest creation actions, such as:

- User modifications
- Adding database homes
- Database creation with a new ID
- Database configuration and setup
- Other customizations that require OEDA's post-guest creation workflows

These actions will need to be performed manually or through alternative means, as OEDA's current capabilities do not extend to these tasks in the context of cloning guests.

Future Updates

This page will be updated with further information as they become available.

Delete Application VMs

Sample for delete one VM:

```
delete guest where name=scaqan01dv0303m
save action
merge actions
# If you only need to remove an Application VM from the configuration (XML) without making any changes to the
underlying infrastructure, you can use the following command:
# merge actions force and skip the deploy actions
deploy actions
```