



Installing CPS vDRA

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Create Installer VM in vSphere

Create the installer VM in VMware vSphere.

Download the vDRA deployer VMDKs and base image VMDKs.

Upload the VDMK File

Upload the VDMK file as shown in the following example:

```
ssh root@my-esxi-1.cisco.com
cd /vmfs/volumes/<datastore>
mkdir cps-images
cd /vmfs/volumes/<datastore>/cps-images
wget http://<your_host>/cps-deployer-host_<version>.vmdk
```

Convert CPS Deployer VMDK to ESXi Format

Convert the CPS deployer host VMDK to ESXi format as shown in the following example:

```
ssh root@my-esxi-1.cisco.com
cd /vmfs/volumes/<datastore>/cps-images
vmkfstools --diskformat thin -i cps-deployer-host_<version>.vmdk
cps-deployer-host_<version>-esxi.vmdk
```

Create CPS Installer VM

Using the vSphere client, create the CPS Installer VM.

-
- Step 1** Login to the vSphere Web Client and select the blade where you want to create a new VM to install the cluster manager VM.

- Step 2** Right-click on the blade and select **New Virtual Machine**. **New Virtual Machine** window opens up.
- Step 3** Select **Create a new virtual machine** and click **Next** to open **Select a name and folder**.
- Step 4** Enter a name for the virtual machine (for example, CPS Cluster Manager) and select the location for the virtual machine. Click **Next**.
- Step 5** Select blade IP address from **Select a compute resource** window and click **Next** to open **Select storage** window.
- Step 6** From **Select storage** window, select *datastorename* and click **Next** to open **Select compatibility** window.
- Step 7** From **Compatible with:** drop-down list, select **ESXi 6.7 and later** and click **Next** to open **Select a guest OS** window.
- Note** Support for VMX11 is added only for fresh install. For upgrade flow (option 2/option 3), upgrade of VMX is not supported.
- Step 8** From **Guest OS Family:** drop-down list, select **Linux** and from **Guest OS Version:** drop-down list, select **Ubuntu Linux (64-bit)**.
- Step 9** Click **Next** to open **Customize hardware** window.
- Step 10** In **Virtual Hardware** tab:
- Select 4 CPUs.
 - Select **Memory** size as **32 GB**.
 - Delete **New Hard Disk** (VM will use the existing disk created earlier with `vmkfstools` command).
 - Expand **New SCSI controller** and from **Change Type** drop-down list, select **VMware Paravirtual**.
 - 2 NICs are required (one for eth1 as internal and second for eth2 as management). One NIC already exists as default under **New Network**.
Under **New Network**, check **Connect At Power On** is selected.
 - To add another NIC, click **ADD NEW DEVICE** and from the list select **Network Adapter**.
Under **New Network**, check **Connect At Power On** is selected.
 - Click **Next** to open **Ready to complete** window.
- Step 11** Review the settings displayed on **Ready to complete** window and click **Finish**.
- Step 12** Press **Ctrl + Alt +2** to go back to **Hosts and Clusters** and select the VM created above (*CPS Cluster Manager*).
- Right-click and select **Edit Settings...**. **Virtual Hardware** tab is displayed as default.
 - Click **ADD NEW DEVICE** and from the list select **Existing Hard Disk** to open **Select File** window.
 - Navigate to `cps-deployer-host_<version>-esxi.vmdk` file created earlier with the `vmkfstools` command and click **OK**.
- Step 13** Adjust hard disk size.
- Press **Ctrl + Alt +2** to go back to **Hosts and Clusters** and select the VM created above (*CPS Cluster Manager*).
 - Right-click and select **Edit Settings...**. **Virtual Hardware** tab is displayed as default.
 - In the **Hard disk 1** text box enter **100** and click **OK**.
- Step 14** Power ON the VM and open the console.
-

Configure Network

Step 1 Log into the VM Console as user: cps, password: cisco123.

Step 2 Create the `/etc/network/interfaces` file using `vi` or using the [here document](#) syntax as shown in the example:

```
cps@ubuntu:~$ sudo -i
root@ubuntu:~# cat > /etc/network/interfaces <<EOF
auto lo
iface lo inet loopback

auto ens160
iface ens160 inet static
address 10.10.10.5
netmask 255.255.255.0
gateway 10.10.10.1
dns-nameservers 192.168.1.2
dns-search cisco.com
EOF
root@ubuntu:~#
```

Step 3 Restart networking as shown in the following example:

```
root@ubuntu:~# systemctl restart networking
root@ubuntu:~# ifdown ens160
root@ubuntu:~# ifup ens160
root@ubuntu:~# exit
cps@ubuntu:~$
```

What to do next

You can log in remotely using the SSH login `cps/cisco123`.

Binding-VNF

The process for installing the binding-vnf is the same as the dra-vnf. Create the configuration artifacts for the binding-vnf using the same VMDK. But use the binding ISO instead of DRA ISO. Similar to the dra-vnf, add a 200 GB data disk to the master and control VMs.

Artifacts Structure

```
cps@installer:/data/deployer/envs/binding-vnf$ tree
.
|-- base.env
|-- base.esxi.env
|-- user_data.yml
|-- user_data.yml.pam
`-- vms
    |-- control-0
    |   |-- control-binding-0
    |   |   |-- interfaces.esxi
    |   |   |-- user_data.yml
    |   |   |-- user_data.yml.pam
    |   |   |-- vm.env
    |   |   `-- vm.esxi.env
```

```

| |-- role.env
| `-- role.esxi.env
|-- control-1
| |-- control-binding-1
| | |-- interfaces.esxi
| | |-- user_data.yml
| | |-- user_data.yml.pam
| | |-- vm.env
| | `-- vm.esxi.env
| |-- role.env
| |-- role.esxi.env
| `-- user_data.yml.disk
|-- master
| |-- master-binding-0
| | |-- interfaces.esxi
| | |-- user_data.yml
| | |-- user_data.yml.functions
| | |-- user_data.yml.pam
| | |-- vm.env
| | `-- vm.esxi.env
| |-- role.env
| `-- role.esxi.env
`-- persistence-db
    |-- persistence-db-1
    | |-- interfaces.esxi
    | |-- vm.env
    | `-- vm.esxi.env
    |-- persistence-db-2
    | |-- interfaces.esxi
    | |-- vm.env
    | `-- vm.esxi.env
    |-- persistence-db-3
    | |-- interfaces.esxi
    | |-- vm.env
    | `-- vm.esxi.env
    |-- role.env
    `-- role.esxi.env

```

```

11 directories, 38 files
cps@installer:/data/deployer/envs/binding-vnf$

```

cps Installer Commands

Command Usage

Use the `cps` command to deploy VMs. The command is a wrapper around the `docker` command that is required to run the deployer container.

Example:

```

function cps () {
    docker run \
        -v /data/deployer:/data/deployer \
        -v /data/vmware:/export/ \
        -it --rm dockerhub.cisco.com/cps-docker-v2/cps deployer/deployer:latest \
        /root/cps "$@"
}

```

To view the help for the command, run the following command: `cps -h`

```

cps@installer:~$ cps -h
usage: cps [-h] [--artifacts_abs_root_path ARTIFACTS_ABS_ROOT_PATH]
          [--export_dir EXPORT_DIR] [--deploy_type DEPLOY_TYPE]
          [--template_dir TEMPLATE_DIR]
          [--status_table_width STATUS_TABLE_WIDTH] [--skip_create_ova]
          [--skip_delete_ova]
          {install,delete,redeploy,list,poweroff,powerson,datadisk}
          vnf_artifacts_relative_path [vm_name [vm_name ...]]

positional arguments:
  {install,delete,redeploy,list,poweroff,powerson,datadisk}
                        Action to perform
  vnf_artifacts_relative_path
                        VNF artifacts directory relative to vnf artifacts root
                        path. Example: dra-vnf
  vm_name
                        name of virtual machine

optional arguments:
  -h, --help
                        show this help message and exit
  --artifacts_abs_root_path ARTIFACTS_ABS_ROOT_PATH
                        Absolute path to artifacts root path. Example:
                        /data/deployer/envs
  --export_dir EXPORT_DIR
                        Absolute path to store ova files and rendered
                        templates
  --deploy_type DEPLOY_TYPE
                        esxi
  --template_dir TEMPLATE_DIR
                        Absolute path to default templates
  --status_table_width STATUS_TABLE_WIDTH
                        Number of VMs displayed per row in vm status table
  --skip_create_ova
                        Skip the creation of ova files. If this option is
                        used, the ova files must be pre-created. This is for
                        testing and debugging
  --skip_delete_ova
                        Skip the deletion of ova files. If this option is
                        used, the ova files are not deleted. This is for
                        testing and debugging

```

List VMs in Artifacts

Use the following command to list VMs in artifacts:

```
cps list example-dra-vnf
```

where, *example-dra-vnf* is the VNF artifacts directory.

Deploy all VMs in Parallel

Use the following command to deploy all VMs in parallel:

```
cps install example-dra-vnf
```

Deploy one or more VMs

The following example command shows how to deploy dra-director-2 and dra-worker-1:

```
cps install example-dra-vnf dra-director-2 dra-worker-1
```

Deploy all VMs with or without a Hypervisor Flag

Use the following command to install all VMs that are tagged with a ESXIHOST value matching hypervisor name as esxi-host-1 in their *vm.esxi.env* file:

```
cps install dra-vnf --hypervisor esxi-host-1
```

The following `cps install` command allows you to perform activities on more than one artifact file, which are tagged with or without `--hypervisor` flag.

```
cps install --addartifact artifact-env-2  
--hypervisor hypervisor-name
```

Health Checks

Using the `--hypervisor` option that you can perform health check of docker engine and consul status of other VMs before making changes on the requested VM.

For example, if you run `cps install --hypervisor esxi-host-1`, then any VMs that are tagged with `esxi-host-1` are excluded and the remaining set of VMs from the artifact file is considered for health check.

VM Name	ESXiHOST
vm01	esxi-host-1
vm02	esxi-host-2
vm03	esxi-host-2

This is done to ensure that VM's on other blades are stable before performing the requested changes on their partner blade VMs. The health check fetches details of the master VM automatically from the artifact file and performs SSH to master, to check if the docker engine and consul status of vm02 and vm03 are in a proper state. If the state is proper, then `cps` command starts the requested operation such as install, power on, or redeploy and so on.

Delete one or more VMs

The following command is an example for deleting `dra-director-1` and `dra-worker-1` VMs:



Note VM deletion can disrupt services.

```
cps delete example-dra-vnf dra-director-1 dra-worker-1
```

Redeploy all VMs

Redeploying VMs involves deleting a VM and then redeploying them. If more than one VM is specified, VMs are processed serially. The following command is an example for redeploying all VMs:



Note VM deletion can disrupt services.

```
cps redeploy example-dra-vnf
```

Redeploy one or more VMs

Redeploying VMs involves deleting a VM and then redeploying them. If more than one VM is specified, VMs are processed serially. The following command is an example for redeploying two VMs:



Note VM deletion can disrupt services.

```
cps redeploy example-dra-vnf dra-director-1 control-1
```

Power down one or more VMs

The following command is an example for powering down two VMs:



Note Powering down the VM can disrupt services.

```
cps poweroff example-dra-vnf dra-director-1 dra-worker-1
```

Power up one or more VMs

The following command is an example for powering up two VMs:



Note Powering Up the VM can disrupt services.

```
cps poweron example-dra-vnf dra-director-1 dra-worker-1
```

Validate Deployment

Use the CLI on the master VM to validate the installation.

Connect to the CLI using the default user and password (admin/admin).

```
ssh -p 2024 admin@<master management ip address>
```

show system status

Use `show system status` command to display the system status.



Note System status percent-complete should be 100%.

```
admin@orchestrator[master-0]# show system status
system status running      true
system status upgrade      false
system status downgrade    false
system status external-services-enabled true
system status debug        false
system status percent-complete 100.0
admin@orchestrator[master-0]#
```

show system diagnostics

No diagnostic messages should appear using the following command:

```
admin@orchestrator[master-0]# show system diagnostics | tab | exclude pass
NODE          CHECK ID          IDX STATUS  MESSAGE
-----
admin@orchestrator[master-0]#
```

show docker engine

All DRA-VNF VMs should be listed and in the CONNECTED state.

```
admin@orchestrator[master-0]# show docker engine
MISSED
ID          STATUS      PINGS
-----
control-0   CONNECTED   0
control-1   CONNECTED   0
dra-director-1   CONNECTED   0
dra-director-2   CONNECTED   0
dra-distributor-1   CONNECTED   0
dra-distributor-2   CONNECTED   0
dra-worker-1     CONNECTED   0
dra-worker-2     CONNECTED   0
master-0        CONNECTED   0

admin@orchestrator[master-0]#
```

show docker service

No containers should be displayed when using the exclude HEAL filter.

```
admin@orchestrator[master-0]# show docker service | tab | exclude HEAL
PENALTY
MODULE  INSTANCE NAME  VERSION  ENGINE  CONTAINER ID  STATE  BOX  MESSAGE
-----
admin@orchestrator[master-0]#
```