

Preparation of Kickstart Server

Cloud Execution Environment

INSTALLATION INSTRUCTIONS

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1 Introduction

This document is part of the installation flow for the Cloud Execution Environment (CEE). For the complete installation flow, refer to section Installation Flow in *CEE Installation*.

This document describes the preparation of the kickstart server that is used for the CEE SW installation process.

Note: It is also possible to configure an installation laptop and use it as kickstart server for the installation of CEE. In this case, transfer IP and VLAN settings from this document to your environment, and make sure to configure the server interfaces and the switch appropriately.

The supported operating system for the installation is Ubuntu Linux.

The preparations can be performed in an office environment, while the connections to the Data Center (DC) described in Section 4 on page 14 have to be performed on site.

In case the installation has to be restarted, refer to Section 5 on page 16.

2 Prerequisites

This section describes the prerequisites that must be fulfilled before vFuel can be installed.

2.1 Hardware and Software Required

The following SW is required:

— CEE SW release tarball:

- `cee-CXC1737883_4-<release>.tar`
- `cee-CXC1737883_4-<release>.tar.md5`
- `cee-CXC1737883_4-<release>.tar.sha1`

The archive files above are referred to as `CEE_<release>.tar`, `CEE_<release>.tar.md5`, and `CEE_<release>.tar.sha1` in this document.

— SW packages for mandatory Fuel plugins:



- Cloud SDN Switch (CSS) Fuel plugin package, see Section 3.6.1 on page 10
- SW packages for optional Fuel plugins:
 - ScaleIO Fuel plugin package, see Section 3.7.1 on page 11
 - SDN Fuel plugin package, see Section 3.7.2 on page 12
 - HDS agent Fuel plugin package, see Section 3.7.3 on page 13

Note: To enable the features provided by the Fuel plugins, installation of the packages is mandatory.

The following files are needed to install vFuel on the kickstart server and are part of the CEE SW release tar archive:

Table 1 Files Required for Kickstart Server

File Required	Information
cee-CXC1737883_4-<release>.iso	Bootable install media
install_vfuel.sh	Shell script file
config.yaml	Configuration file templates needed for vFuel installation

2.2 Tools

This section describes the tools required for the procedure.

- For kickstart server: a computer with Ubuntu operating system installed. Ubuntu 14.04 was used in verification of this document. Additional software package requirements needed for Linux installation are described in Table 2.
- Hardware requirements:
 - Use the Kickstart Server section in the Multi-Server System Dimensioning Guide, CEE 6 for resource allocation of vFuel on the kickstart server.
 - The respective values for CPU, RAM, and disk space for vFuel must be checked in the config.yaml, refer to the Configuration File Guide for more information.
- Virtualization feature (VT-x) must be supported and enabled.
- For CEE regions that use Dell HW:
 - One 1 Gbps Ethernet NIC
 - One RJ45-RJ45 cat6 Ethernet cable
- For CEE regions that use BSP HW:



- Two 1 Gbps Ethernet NICs
 - Two TSR 491 603 (DensiShield-RJ45) cables
 - If the preparations are done away from the BSP, two RJ45-RJ45 cat6 Ethernet cables
- Internet connectivity
 - Switch

2.3 Installation Data

The following data is needed:

- Account for the kickstart server: username and password of a user with sudo privileges.
- Initial vFuel root user password (used for installation only).
- `config.yaml`: a template `config.yaml` file from the tarball updated with deployment-specific data. For more information, refer to [Configuration File Guide](#).

Note: If the document is used as part of disaster recovery procedure, the `config.yaml` file extracted from the backup must be used. For more information, refer to [Disaster Recovery](#).
- All other deployment-specific YAML files configured according to [Configuration File Guide](#).
- Optional Fuel plugin list for the installation. For more information, refer to [Configuration File Guide](#).
- IP and VLAN plan, updated with customer and site-specific values. This plan among others, specifies:
 - IP address for the kickstart server in network `fuel_ctrl_sp`
 - IP addresses for vFuel in networks `fuel_ctrl_sp` and in case of Dell `subrack_ctrl_sp`.

Note: All examples in this document use the default values from the document IP and VLAN plan. The actual customer-defined addresses must be used when performing the steps in this document.

Temporary IP addresses are needed in the customer network during the installation. These addresses must not interfere with the customer network.



2.4 Time Required

The expected execution time for the complete the kickstart server procedure is about 1.5 hours.

3 Prepare Kickstart Server

This section describes how to prepare and test the kickstart server.

If a kickstart server for CEE SW installation is already available, continue with the instructions of the documents [SW Installation in Multi-Server Deployment](#) or [SW Installation in Single Server Deployment](#).

3.1 System Setup

Prepare the kickstart server by executing the below steps.

1. Enable virtualization technology (VT-x) in BIOS settings of the kickstart server. Refer to the documentation of BIOS/laptop manufacturer for details.
2. Log on to the kickstart server and change root shell:

```
sudo su
```

3. Verify that the correct local time and date has been set by using the command:

```
date
```

If the time and date is not correct, set time and date by using the command:

```
date -s "mmm dd hh:mm:ss yyyy"
```

mmm is month: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, or Dec.

dd is day of month: 01 - 31

hh:mm:ss is hours: 00 - 23, minutes: 00 - 59 and seconds: 00 - 59

yyyy is the year with four digits, such as 2016

4. Check the required packages listed in Table 2 using the command:

```
dpkg -l | grep <package_name>
```

In case a package is not installed, use the command (internet connectivity is required):

```
apt-get install <package_name>
```




In case a version is lower than required, use the command (internet connectivity is required):

```
apt-get upgrade <package_name>
```

Table 2 Required Packages for Ubuntu 14.04 LTS

Package Required	Version this Document Was Tested with
python-yaml	3.10-4ubuntu0.1
python-netaddr	0.7.10-1ubuntu1.1
ruby	1:1.9.3.4
libvirt-bin	1.2.2-0ubuntu13.1.16
genext2fs	1.4.1-4build1
virtinst	0.600.4-3ubuntu2
qemu-utils	2.0.0+dfsg-2ubuntu1.22
qemu-system-x86	2.0.0+dfsg-2ubuntu1.22
qemu-kvm	2.0.0+dfsg-2ubuntu1.22
sshpas	1.05-1
vlan	1.9-3ubuntu10

- Based on the hardware, continue the preparation steps in Section 3.2 on page 5 or Section 3.3 on page 6.

3.2 Network Preparation in case of non-BSP Hardware

- Connect the kickstart server to any Ethernet switch.

For non-BSP HW, the kickstart server must have one eth interface, referred to as eth0 in this document. Replace the example eth0 interface with the customer and site specific one.

- Configure the Ethernet network interface. The default IP address of the kickstart server is 192.168.0.19 in the fuel_ctl_sp network, based on the default IP and VLAN plan. Replace the default IP address with your site specific value.

For more information on the default and site-specific IP and VLAN plan, see Section 2.3 on page 3.

- Configure the network interface by setting the contents of /etc/network/interfaces:

```
iface eth0 inet static
    address 192.168.0.19
    netmask 255.255.255.0
```



Ensure that `eth0` configuration is explicitly written in `/etc/network/interfaces`.

Note: Refer to your site-specific IP and VLAN Plan, and ensure that this IP address is not in conflict with other IP addresses in the DHCP pool of `fuel_ctrl_sp` network.

Sourced contents, for example, source `/etc/network/interfaces.d/*.cfg` cannot be handled by `libvirt`. Add content to file as it is described.

- b. Apply changes:

```
ifdown eth0
```

```
ifup eth0
```

- c. Check if the interface can be detected by `libvirt`:

```
virsh iface-list --all
```

The response must contain `eth0` with active state.

- d. Check the interface with the command:

```
ip a
```

The IP address of `eth0` must be `192.168.0.19`.

3. Continue the installation process in Section 3.4 on page 8.

3.3 Network Preparation in case of BSP Hardware

1. Set the Ethernet network interfaces and `br-fw-admin` bridge.

For BSP HW, the kickstart server must have two `eth` interfaces, referred to as `eth0` and `eth1` in this document. Replace the example interfaces `eth0` and `eth1` with the customer and site specific ones. This process was tested with Dell laptop internal motherboard Ethernet port (`eth0`) and one additional USB 3.0 to Gigabit LAN adapter (`eth1`).

2. Connect two Ethernet interfaces to any Ethernet switch.
3. Find `shelf_mgmt` and `fuel_ctrl_sp` related sections from `config.yaml`.

The following `config.yaml` contents serve as input for the next steps:

```
...
shelf_mgmt:
  ip: 192.168.2.2
  name: cee_ctrl_sp
  lct_ip: 10.0.10.2
```



```

        passwd: ett,30
        username: advanced
...
    name: fuel_ctrl_sp
    mos_name: fuelweb_admin
    tag: 4028
    cidr: 192.168.0.11/24
    dhcp_pool_start: 192.168.0.20
    dhcp_pool_end: 192.168.0.253

```

4. Copy the below interface definition to `/etc/network/interfaces`.

```

auto eth0
iface eth0 inet manual

auto eth1
iface eth1 inet manual

auto br-fw-admin
iface br-fw-admin inet static
address 192.168.0.19
netmask 255.255.255.0
bridge_ports eth0.4028 eth1
bridge_stp on
bridge_fd 5

auto br-fw-admin:0
iface br-fw-admin:0 inet static
address 10.0.10.19
netmask 255.255.255.0

```

Modify **bold** emphasized values.

Ensure that the following conditions are met when selecting values:

- The first bridge address (192.168.0.19 in example above) must be the IP address of the kickstart server in `fuel_ctrl_sp` network. Refer to your site-specific IP and VLAN Plan, and ensure that this IP address is not in conflict with other IP addresses in the DHCP pool of `fuel_ctrl_sp` network. VLAN tag must be equal to the `fuel_ctrl_sp` tag (4028 in example above).
- The second bridge address (10.0.10.19) should be in the same network as `lct_ip`.

Note: For values, refer to your site-specific IP and VLAN Plan, and ensure that IP addresses are not in conflict with other IP addresses.

5. Reboot the kickstart server to apply changes.
6. Check if the interface can be detected by `libvirt` by executing the following command:



```
virsh iface-list --all
```

br-fw-admin must be in active state.

3.4 Install vFuel in Libvirt Managed VM

In the kickstart server, do the following:

3.4.1 Unpack Release tar

1. Copy the CEE_<release>.tar, CEE_<release>.tar.md5, and CEE_<release>.tar.sha1 files to a directory.
2. Validate the integrity of the tarball by using the following commands:

a. `md5sum CEE_<release>.tar`

The output of the command must match with the checksum value present in CEE_<release>.tar.md5.

b. `sha1sum CEE_<release>.tar`

The output of the command must match with the checksum value present in CEE_<release>.tar.sha1.

If the respective outputs do not match, contact next level of maintenance support.

3. Unpack the tar file using the command:

```
tar -xvf CEE_<release>.tar
```

3.4.2 Install vFuel

The steps below must be executed with a user with sudo privileges.

1. Check the privileges of the current user:

```
groups
```

Response must contain sudo libvirtd.

Note: Current user must not be a root user.

2. Check if the .ssh directory exists:

```
ls -ld ~/.ssh
```

In case the .ssh directory is missing, create one and set permissions:

```
mkdir ~/.ssh
```



```
chmod 700 ~/.ssh
```

3. Create a new `config.yaml` in the `CEE_RELEASE/` directory using vi Editor and paste the content of the site-specific `config.yaml`.
4. Change working directory:

```
cd CEE_RELEASE/scripts
```

5. Perform the following command:

Note: The `install_vfuel.sh` script cannot be executed as root. Do not change to root shell with `sudo su` before starting it.

```
./install_vfuel.sh [--iface <interface>]
                  [--mem <memory_in_MiB>]
                  [--vcpus <number_of_vcpus>]
                  [--bond <network_bond>]
```

Optional arguments

Parameter	Description
<code>--iface</code>	Specifying an interface is only needed if more than one interface has IP addresses in the <code>fuel_ctrl_sp</code> network configured.
<code>--mem</code> ⁽¹⁾	Memory in MiB allocated for vFuel on the kickstart server.
<code>--vcpus</code> ⁽¹⁾	Number of vCPUs allocated to vFuel on the kickstart server.
<code>--bond</code> ⁽²⁾	Specifies the bond on the data network to access public / <code>cee_om_sp</code> network.

(1) Memory and CPU allocation is only applied to vFuel on the kickstart server. Once vFuel is migrated to CEE, the values defined in `config.yaml` will be used.

(2) Only applicable for CEE deployments using HDS 8000 hardware when the bond name is not specified as `bond0`.

For vFuel CPU core and RAM allocation values on the kickstart server, refer to the [Multi-Server System Dimensioning Guide, CEE 6](#).

6. Log in to Fuel using initial vFuel server root user password.

```
ssh root@192.168.0.11
```

7. Check vFuel logs by executing the following command:

```
tail -n1 /var/log/puppet/bootstrap_admin_node.log
```

The response must be as follows:



Fuel node deployment complete!

If an error message is shown, contact next level of support.

3.5 Change vFuel Password

1. Change the Fuel default root password to customer-specific value.

- a. Execute the following command in Fuel master as root:

```
passwd
```

- b. Provide customer-specific password.

3.6 Add Mandatory Fuel Plugins

This section lists mandatory Fuel plugins that require additional packages during CEE software installation.

3.6.1 Cloud SDN Switch Fuel Plugin

Note: The CSS Fuel package is delivered by the SDN organization.

Once Fuel is installed on the kickstart server, follow the steps described in this section to add the CSS Fuel plugin package to Fuel.

Note: The CSS Fuel package is not an optional component. CEE installation fails if the package is not added.

The following SW is required for CSS:

— CSS Fuel Plugin:

- CSS-PLUGIN-CXP9035036_2-<release>~<build_number>.tar.gz

3.6.1.1 Unpack CSS Fuel Plugin tar File

1. Copy the CSS-PLUGIN-CXP9035036_2-<release>~<build_number>.tar.gz to any directory.

2. Unpack the file using the following command:

```
tar -xvf CSS-PLUGIN-CXP9035036_2-<release>~<build_number>.tar.gz
```

3. Ensure that all files are extracted:

```
ericsson_css-<plugin_version>.noarch.rpm
```

4. Validate the integrity of the .rpm file by comparing the outputs of the following commands with the contents of the respective .sha1 file.



If the checksums do not match, contact next level of maintenance support.

3.6.1.2 Upload CSS Fuel Plugin Package to Fuel

1. Upload the CSS Fuel plugin package to the install directory on Fuel:

```
scp ericsson_css-<plugin_version>.noarch.rpm
root@<fuel_address>:
/var/www/nailgun/ericsson/fuel-plugins/
```

3.7 Add Optional Fuel Plugins

This section lists Fuel plugins that require additional packages during CEE software installation.

3.7.1 ScaleIO Fuel Plugin

When ScaleIO is selected as a storage back end, the ScaleIO Fuel plugin package is required.

Once Fuel is installed on the kickstart server, follow the steps in this section to add the ScaleIO Fuel plugin package to Fuel.

The following SW is required for ScaleIO:

- ScaleIO Fuel Plugin:
 - CXC1740177_4_<release>.tar
- ScaleIO GUI (optional):

The GUI package contains installers for Windows and Linux based workstations.

- CXC1740363_4_<release>.tar

Installing the GUI is optional.

3.7.1.1 Unpack ScaleIO Fuel Plugin tar File

1. Copy the CXC1740177_4_<release>.tar file to any directory.
2. Unpack the tar file using the following command:

```
tar -xvf CXC1740177_4_<release>.tar
```

3. Validate the integrity of the .rpm file by comparing the outputs of the following commands with the contents of the respective .md5 or .sha1 file:

```
md5sum scaleio-<plugin_version>.rpm
```

```
sha1sum scaleio-<plugin_version>.rpm
```



If the checksums do not match, contact next level of maintenance support.

3.7.1.2 Upload ScaleIO Fuel Plugin Package to Fuel

1. Upload the ScaleIO Fuel plugin package to the install directory on Fuel:

```
scp scaleio-<plugin_version>.rpm root@<fuel_address>:
/var/www/nailgun/ericsson/fuel-plugins/
```

3.7.2 SDN Fuel Plugins

Note: SDN Fuel plugin packages are delivered by the SDN organization.

When SDN is selected as a networking solution, the SDN related Fuel plugin packages are required.

Once Fuel is installed on the kickstart server, follow the steps in this section to add the SDN Fuel plugin package to Fuel.

The following SW is required for SDN:

— SDN Fuel plugins:

- FUEL_PLUGIN_ERIC_SDNC-CXP9034736_<suffix>-<release>.tar.gz
- FUEL_PLUGIN_BGPVPN-CXP9034737_<suffix>-<release>.tar.gz
- FUEL_PLUGIN_L2GW-CXP9034738_<suffix>-<release>.tar.gz
- FUEL_PLUGIN_CSCTOOLS-CXP9035957_<suffix>-<release>.tar.gz

The CSC Tools Package is required for the upgrade and rollback of the Cloud SDN Controller (CSC). For more information, refer to Cloud SDN document, Cloud SDN Upgrade and Rollback, Reference [1].

3.7.2.1 Unpack SDN Fuel Plugin tar File

1. Copy the FUEL_PLUGIN_ERIC_SDNC-CXP9034736_<suffix>-<release>.tar.gz, FUEL_PLUGIN_BGPVPN-CXP9034737_<suffix>-<release>.tar.gz, and FUEL_PLUGIN_L2GW-CXP9034738_<suffix>-<release>.tar.gz files to any directory.

2. Unpack the tar files using the following commands:

```
tar -xvf FUEL_PLUGIN_ERIC_SDNC-CXP9034736_<suffix>-<release>.tar.gz
```

```
tar -xvf FUEL_PLUGIN_BGPVPN-CXP9034737_<suffix>-<release>.tar.gz
```

```
tar -xvf FUEL_PLUGIN_L2GW-CXP9034738_<suffix>-<release>.tar.gz
```




Ensure that all three tarballs are extracted:

- bgpvpn-<plugin_version>.noarch.rpm
- ericsson_sdnc-<plugin_version>.noarch.rpm
- l2gw-<plugin_version>.noarch.rpm

3. Validate the integrity of the .rpm files by comparing the outputs of the following commands with the content of respective .sha1 file.

If the checksums do not match, contact next level of maintenance support.

3.7.2.2 Upload SDN Fuel Plugin Packages to Fuel

1. Upload the BGP VPN Fuel plugin package to the install directory on Fuel:

```
scp bgpvpn-<plugin_version>.noarch.rpm root@<fuel_address>:
/var/www/nailgun/ericsson/fuel-plugins/
```

2. Upload the Ericsson SDNC Fuel plugin package to the install directory on Fuel:

```
scp ericsson_sdnc-<plugin_version>.noarch.rpm
root@<fuel_address>:
/var/www/nailgun/ericsson/fuel-plugins/
```

3. Upload the L2GW Fuel plugin package to the install directory on Fuel:

```
scp l2gw-<plugin_version>.noarch.rpm root@<fuel_address>:
/var/www/nailgun/ericsson/fuel-plugins/
```

3.7.3 HDS Agent Fuel Plugin

If using HDS hardware platform, the HDS agent Fuel plugin package is required.

Once Fuel is installed on the kickstart server, follow the steps in this section to add the HDS Agent Fuel plugin package to Fuel.

The following SW is required for the HDS agent:

- HDS agent Fuel plugin:
 - CXC1740740_4_<release>.tar

3.7.3.1 Unpack HDS Agent Fuel Plugin tar File

1. Copy the 1_CXC1740740_4_<release>.tar file to any directory.
2. Unpack the tar file using the following commands:

```
tar -xvf 1_CXC1740740_4_<release>.tar
```

Ensure that all files are extracted:



- `ericsson_hds_agent-<plugin_version>.noarch.rpm`
- `ericsson_hds_agent-<plugin_version>.noarch.rpm.md5`
- `ericsson_hds_agent-<plugin_version>.noarch.rpm.sha1`

3. Validate the integrity of the `.rpm` file by comparing the outputs of the following commands with the content of respective `.md5` or `.sha1` file:

```
md5sum ericsson_hds_agent-<plugin_version>.noarch.rpm
```

```
sha1sum ericsson_hds_agent-<plugin_version>.noarch.rpm
```

If the checksums do not match, contact next level of maintenance support.

3.7.3.2 Upload HDS Agent Fuel Plugin Package to Fuel

1. Upload the HDS agent Fuel plugin package to the install directory on Fuel:

```
scp ericsson_hds_agent-<plugin_version>.noarch.rpm  
root@<fuel_address>:  
/var/www/nailgun/ericsson/fuel-plugins/
```

3.7.4 Continue CEE Software Installation

After uploading the Fuel plugins to the Fuel install directory, CEE software installation can continue. The uploaded components are automatically deployed.

3.8 Fuel Synchronization

Fuel is a non-redundant component, therefore creating a Fuel backup and keeping a copy of it outside of CEE is highly recommended to make disaster recovery possible. Perform a synchronization as described in [Fuel Synchronization](#).

Note: Fuel synchronization is not available on single server deployments, as the Fuel VM is not migrated to the CEE region.

4 Connect to DC

The connections in this section have to be done on site.

- In case of non-BSP multi-server hardware, connect the kickstart server to the allocated and configured port of Extreme control switch A with the LAN cable.



- In case of single server deployment, make the connections according to Table 3. For the connector orientation, see Figure 1. For an overview of the networks in the control switching domain, see Figure 2.
- In case of BSP hardware, make the connections according to Table 4. The `fuel_ctrl_sp` VLAN must be configured along the path between the GE1 port of SCX blade and the kickstart server.

Table 3 Connections to Single Server

Server	Server Port	Untagged VLAN	Tagged VLAN	Switch Port ⁽¹⁾
Dell Single Server	iDRAC		subrack_ctrl_sp	a
	ETH-0	fuel_ctrl_sp	cee_ctrl_sp	b
	NIC3(traffic)		cee_om_sp, tenant_3582, tenant_3583, tenant_n	c
Fuel	iDRAC		subrack_ctrl_sp	d
	ETH-0	fuel_ctrl_sp	cee_ctrl_sp, subrack_ctrl_sp	e

(1) Switch port names are arbitrary. Use a separate switch port for each connection.

Table 4 Connections to BSP HW

Kickstart server interface	Port on SCXB-L in Subrack 0	VLAN
eth0	GE-1	tagged
eth1	E-DBG	untagged

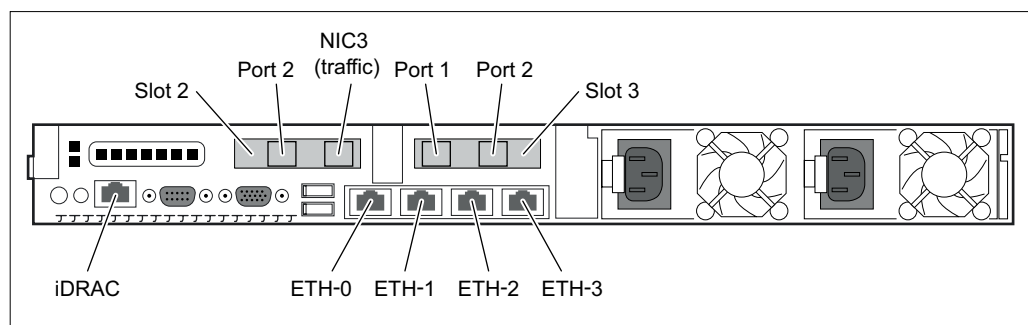


Figure 1 Connector Orientation, Dell PowerEdge, Back

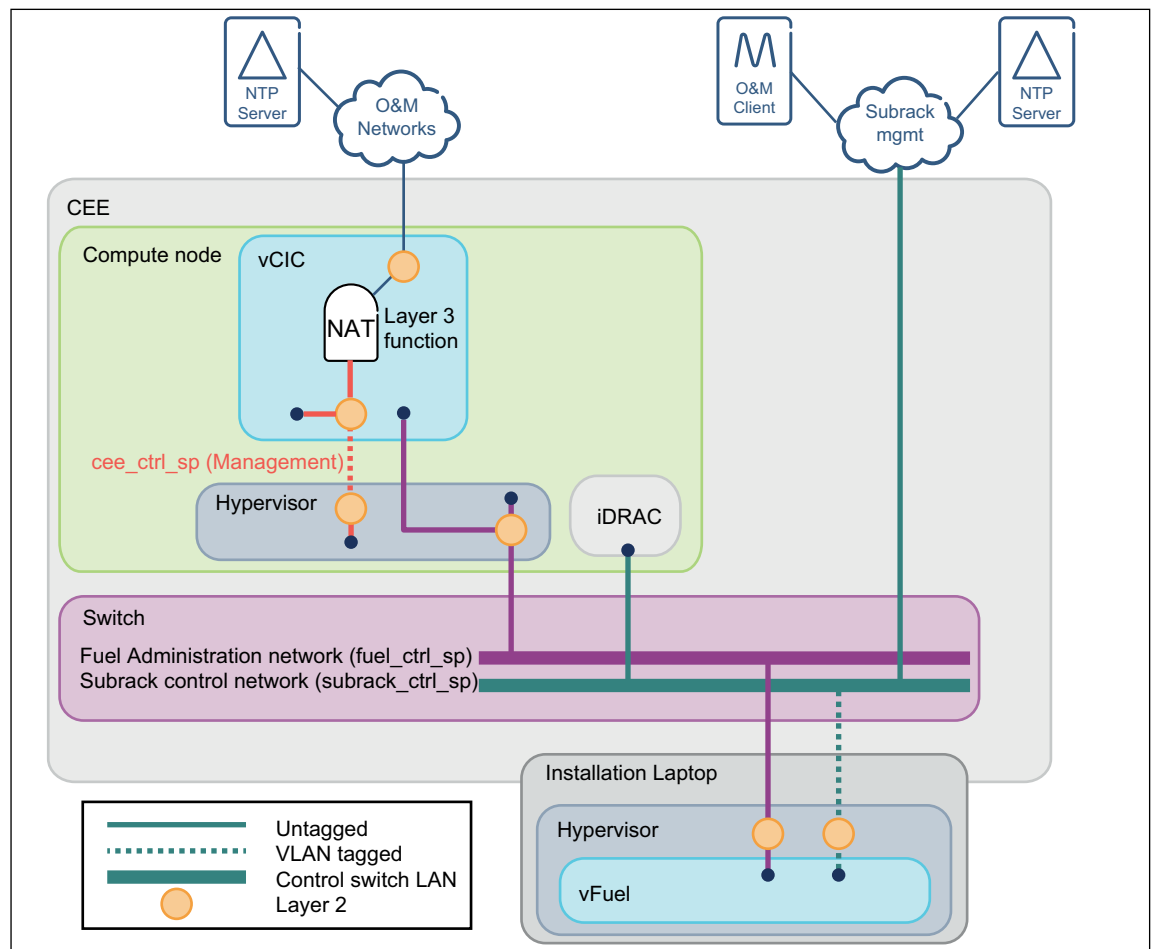


Figure 2 Networks in the Single Server Control Switching Domain

5 Troubleshooting

In case the installation has to be restarted on the kickstart server, follow these steps:

1. Delete the known_hosts file:

```
rm ~/.ssh/known_hosts
```

2. Make sure that the Ethernet interface (in case of BSP both Ethernet interfaces) is connected to a switch so the bridge br-fw-admin is up.
3. Run the script with the following option:



```
./install_vfuel.sh --iface br-fw-admin
```

Note: The first execution of the script generates bridge `br-fw-admin`. Therefore `--iface br-fw-admin` option is to be used for both BSP and non-BSP hardware. The `--iface eth0` option is not suitable.



Reference List

- [1] Cloud SDN Upgrade and Rollback, 1/1543-HSD 101 048/2-3