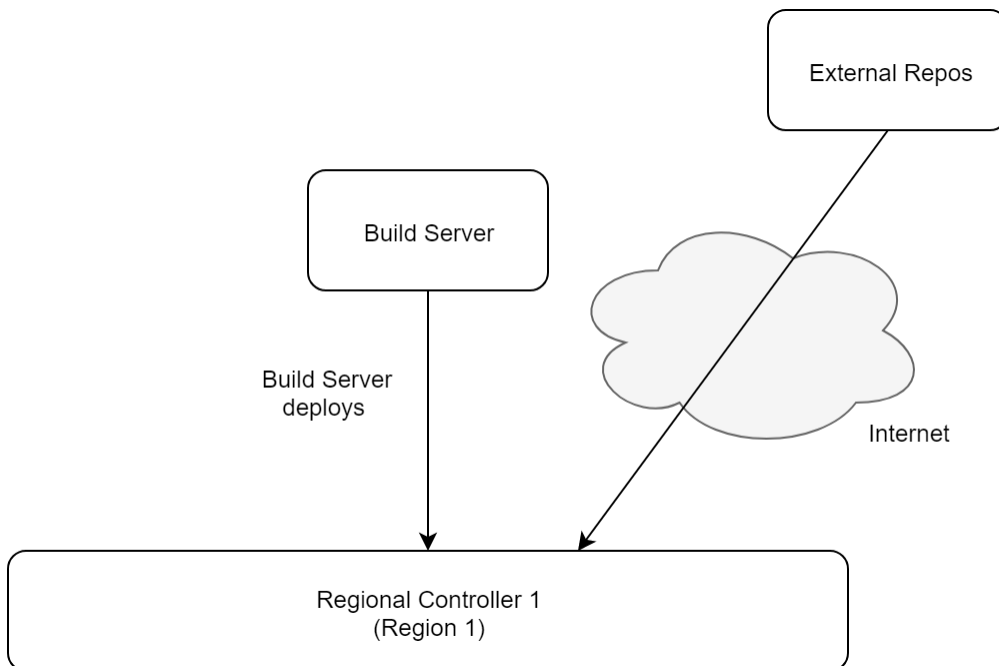


# Installing a RC on a Bare Metal Server

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## Introduction



This installation procedure creates a new Regional Controller on a bare metal server. **The bare metal server which will become the RC is termed the 'Target RC' or just 'Target Server' in this guide.**

The Build Server remotely installs the Linux operating system, Network Cloud specific and other software packages on the Target Server to create a new Regional Controller. Once the RC is build it is used to subsequently deploy either Rover or Unicycle pods. After the Build Server has completed the creation of the Regional Controller, the Build Server has no further role in any Network Cloud Rover or Unicycle Pod deployment.

The installation procedure is executed from the Build Server and automatically performs all the following on the Target Server:

- Modify the BIOS including DHCP and PXE boot configuration by issuing Redfish API commands to the Target Server's iDRAC or iLO BMC
- Install and update an Ubuntu 16.04 operating system
- Install Network Cloud Regional Controller specific software including
  - PostgreSQL DB
  - Camunda Workflow and Decision Engine
  - Akraino Web Portal
  - LDAP configuration
- Install a number of supporting supplementary software components including
  - OpenStack Tempest tests
  - YAML builds
  - ONAP scripts
  - Sample VNFs

# Preflight requirements

## Server iDRAC/iLO provisioning

The RC's iDRAC/iLO IP address and subnet must be manually provisioned into the server before installation begins.

## Networking

The Target RC has multiple physical and VLAN interfaces. The Build Server uses different interfaces during the different stages of its creation of a RC on the Target Server. A very detailed description of the entire networking setup can be found in the [Network Architecture](#) section of this release documentation. In addition the networking configuration with example values similar to that used during validation testing is contained in the Validation Labs section of this release documentation [Ericsson Unicycle OVS-DPDK Validation HW, Networking and IP plan](#).

The Build Server must have IP connectivity to the Target Server's dedicated BMC port using ports 80 (http) and 443 (https) in order to issue Redfish commands to configure the Target Server's BIOS settings. The Target Server's BMC IP address is denoted as <SRV\_OOB\_IP> in this guide. **The Target Server's BMC must be manually preconfigured with the <SRV\_OOB\_IP> address.**

After setting the Target Server's BIOS, the Build Server will then (usually) act as the DHCP server for the initial Target Server's boot process. The Target Server will be automatically configured by the Redfish API commands to send its initial DHCP Request from one of its main NICs via the VLAN tagged 'host' network. Thus the Target Server's 'host' interface and the Build Server's DHCP server interface must be in the same broadcast domain so that the DHCP Request broadcast frame can reach the Build Server. It is possible to remove the need for the Build Server and Target Server to be on the same L2 domain using DHCP relay/helper functionality in the TOR to relay the Target Server's DHCP requests across an IP routed network, however this has not been verified in the R1 release and this guide assumes the build and Target Servers to be on the same L2 broadcast domain as described in the detailed networking section.

During the layer stages of the installation the Target Server's 'host' interface must have connectivity to the internet to be able to download the necessary repos and packages.

## Software

When the RC is installed on a new bare metal server no software is required on the Target Server. All software will be installed from the Build Server and /or external repos via the internet.

## Preflight checks

To verify the necessary IP connectivity from the Build Server to the Target Server's BMC confirm from the Build Server that at least port 443 is open to the Target Server' iDRAC/iLO BMC IP address <SRV\_OOB\_IP> :

```
build_server# #nmap -sS <SRV_OOB_IP>

build_server# nmap -sS 10.51.35.146

Starting Nmap 7.01 ( https://nmap.org ) at 2018-07-10 13:55 UTC Nmap scan report for 10.51.35.146 Host is up
(0.00085s latency). Not shown: 996 closed ports PORT STATE SERVICE 22/tcp open  ssh 80/tcp open  http 443
/tcp open  https 5900/tcp open  vnc Nmap done: 1 IP address (1 host up) scanned in 1.77 seconds
```

Note: The enumerated IP shown (10.51.35.146) is an example iDRAC address for a RC deployed in a validation lab.

## Preflight RC Region Specific Input Data

The automated deployment process configures the new RC based on a set of user defined values specific to each RC. These values must be created and stored in a yaml configuration file before the RC deployment process can be started.

During the previous Build Server installation a generic template called *serverrc.template* was created on the Build Server in */opt/akraino/redfish/*. This template should be used to create the deployment specific input file for the new RC. The example below is for a file called *aknode29rc* to create a RC on a server called *aknode29*.

```

root@build-server# mkdir -p /opt/akraino/server-config

root@build-server# #cp /opt/akraino/redfish/serverrc.template /opt/akraino/server-config/<TARGET_SRV_NAME>rc

root@build-server# cp /opt/akraino/redfish/serverrc.template /opt/akraino/server-config/aknode29rc

root@build-server# #vi /opt/akraino/server-config/<TARGET_SRV_NAME>rc

root@build-server# vi /opt/akraino/server-config/aknode29rc

#Now edit the file and insert the site specific data for the new RC

```

An actual *serverrc* input file used in a validation lab to build an RC is shown at the end of this page.

## Deploying the RC

The RC is deployed in two stages, first the bare metal and Linux OS installation occurs then the Network Cloud specific software is installed on the Target RC server.

Elevate yourself to root:

```

user@build_server:/# sudo -i

```

## Operating System Installation

To begin the Regional Controller's BIOS provisioning and Linux installation do the following (*aknode29* is an example):

```

root@build-server# #/opt/akraino/redfish/install_server_os.sh --rc /opt/akraino/server-config
/<RC_INPUT_FILE_NAME> --skip-confirm

root@build-server# /opt/akraino/redfish/install_server_os.sh --rc /opt/akraino/server-config/aknode29rc --skip-
confirm

```

During the installation the progress can be monitored by viewing the following logfile on the Build Server in `/var/log/akraino/install_server_os_<DATE>`

The BIOS configuration and Linus installation results in numerous reboots of the Target Server which each take many minutes. In addition software packages are transferred and updated on the Target RC server resulting in a total installation time of [approximately 20 to 30 minutes](#). The actual time will vary depending on the time taken to retrieve packages from their external repos.

A successful installation of this stage of the RC deployment will result in the following message:

```

root@build-server# Completed bare metal install of regional server [aknode29] at Mon Jul 2 20:09:35 UTC 2018
SUCCESS: Try connecting with 'ssh root@10.51.34.230' as user root Elapsed time was 9 minutes and 22 seconds

```

## RC Specific Software Installation

Once the previous stage is complete the Network Cloud specific software must then be installed.

During the second stage of the RC deployment process the Build Server will use the Target RC server's '*host*' address. to complete the operating system installation The RC's planned '*host*' address must be manually configured in a file on the build called *akrainrc* in `/opt/akraino/region/`.

Locate and set the `TARGET_SERVER_IP` value in the *akrainrc* file to the planned Regional Controller's '*host*' address. All other values must be left as-is.

```

root@build-server# vim /opt/akraino/region/akrainorc

```

Note: The enumerated IP shown (10.51.34.230) is an example '*host*' address for a RC deployed

**Report Iss**

Once this has been set and the file saved export the value using

```
root@build-server# #export TARGET_SERVER_IP=<TARGET_SERVER_IP>

root@build-server# #export TARGET_SERVER_IP=10.51.34.230
```

Note: The enumerated IP shown (10.51.34.230) is an example *'host'* address for a RC deployed in a validation lab.

The final step installs the Regional Controller software:

```
root@build-server# /opt/akraino/region/install_akraino_portal.sh
```

This will also take 10 to 20 minutes.

A successful installation will end with the following message

```
...

Setting up tempest content/repositories
Setting up ONAP content/repositories
Setting up sample vnf content/repositories
Setting up airshipinabottle content/repositories
Setting up redfish tools content/repositories
SUCCESS: Portal can be accessed at http://10.51.34.230:8080/AECPortalMgmt/
SUCCESS: Portal install completed
```

Note: The enumerated IP shown (10.51.34.230) is an example *'host'* address for a RC deployed in a validation lab.

The Regional Controller Node installation is now complete.

Please note: It will be necessary to generate rsa keys on the newly commissioned RC which must then be copied and inserted into the 'genesis\_ssh\_public\_key' attribute in site input yaml file used when subsequently deploying each Unicycle pod at any edge site controlled by the newly built RC. This will be covered in the Unicycle installation instructions.

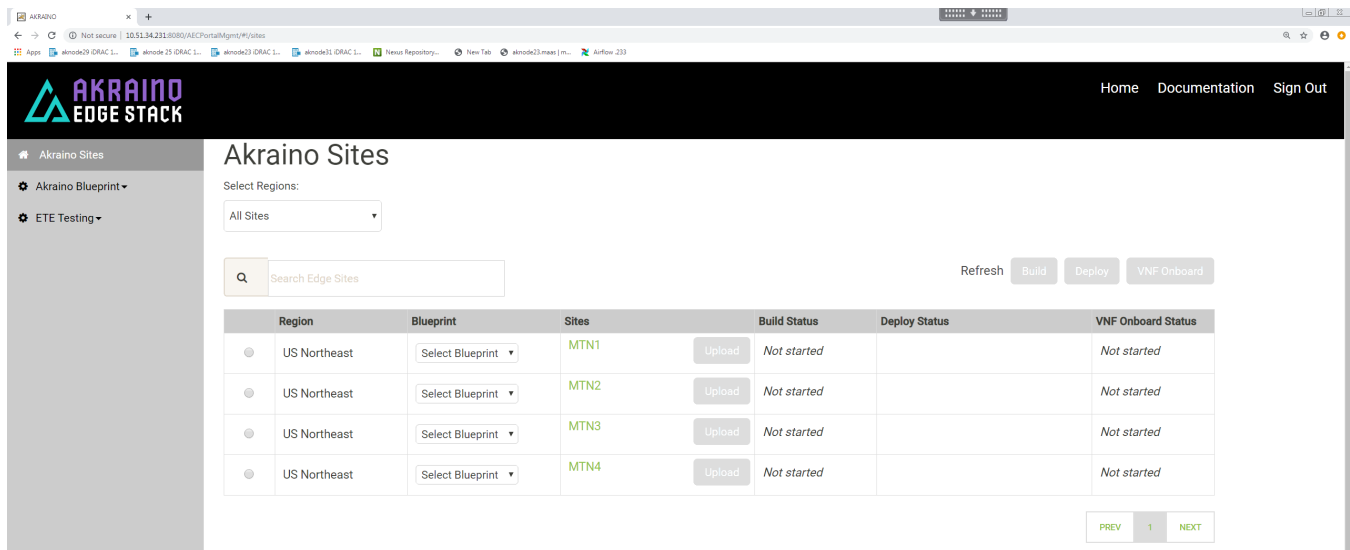
## Accessing the new Regional Controller's Portal UI

During the final stage of the installation a UI will have been installed on the newly deployed RC. This UI will be used to subsequently deploy all Rover and Unicycle pods to edge locations. The RC's portal can be opened in **Chrome** via the portal URL `http://TARGET_SERVER_IP:8080/AECPortalMgmt/` where `TARGET_SERVER_IP` is the RC's *'host'* IP address. Note: IE or Edge browsers may not currently work with this UI.

Use the following credentials:

- Username: *akadmin*
- Password: *akraino*

Upon successful login, the Akraino Portal home page will appear.



## Parameter Naming

RC's iDRAC BMC address: OOB\_SRV\_IP

RC's 'host' network address : TARGET\_SERVER\_IP

RC's host name: NEW\_RC\_SRV\_NAME

## Regional Controller Region Specific Input File

This section includes an example input file similar to that used during Ericsson Validation testing to build a Regional Controller for the R1 release. Being region specific the enumerated values will differ for RCs in different regions. Full details of the relevant validation lab setup that should be referenced when looking at these files is contained in the [Ericsson Validation Labs](#) section of this documentation.

- [Example Configuration Input File - Regional Control on Dell 740XD Server](#)