

# Install Guide - Akraino Edge Stack Network Cloud Blueprint - Rover

PLEASE REFER TO R1 NETWORK CLOUD RELEASE DOCUMENTATION

[NC Family Documentation - Release 1](#)

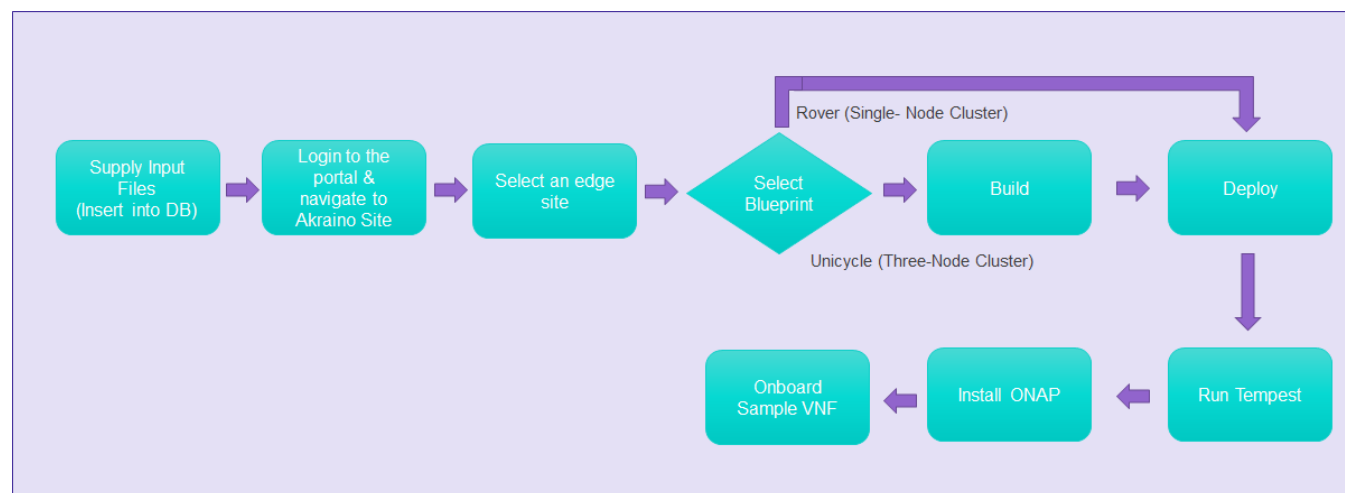
THIS DOCUMENTATION WILL BE ARCHIVED

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## Introduction

This document describes the steps to create a single and multi-node edge sites.



 Unicycle (Three-Node Cluster) - Supported in the future release

## Akraino Portal Operations

### Login

Visit the portal URL [http://REGIONAL\\_NODE\\_IP:8080/AECPortalMgmt/](http://REGIONAL_NODE_IP:8080/AECPortalMgmt/) where REGIONAL\_NODE\_IP is the Portal IP.

Use the following credentials:

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

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

## Deploy an Edge Site Based on a Rover Blueprint

From the Portal home page:

1. Select an Edge Site MTN1 or MTN2 (these are the two default lab sites hosted in middle town NJ) by clicking on radio button provided in the first column of the table.
2. For the selected Edge Site, select a Rover Blueprint from the drop-down menu.
3. Click on Upload button (in the Sites column), this will open a pop-up dialog
4. Provide the edge site-specific details such as:
  - a. Host IP address
  - b. Host username
  - c. Host password.
5. Click on Browse button, select the input file for Blueprint - Rover (Single-Node Cluster).  
The input file is a property file that stores information in `key-value` format. Sample input file used for 'Rover' deploy:

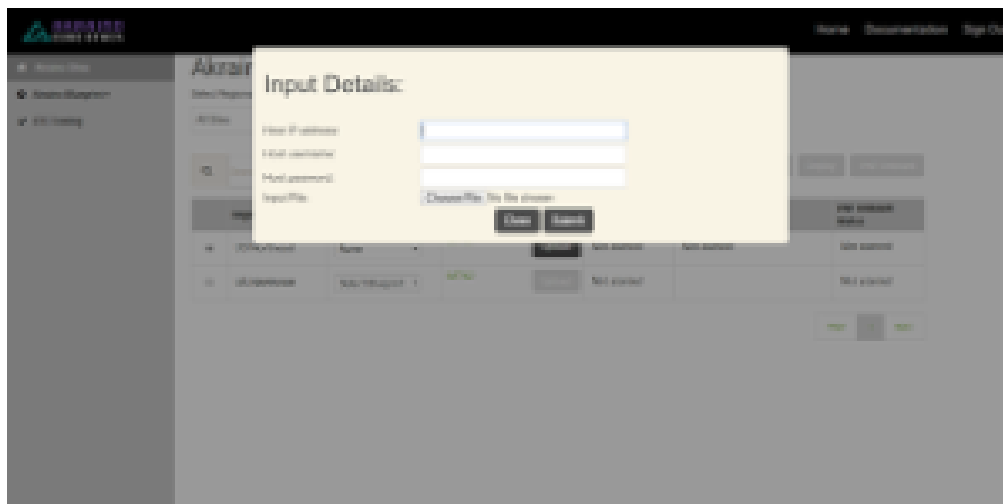
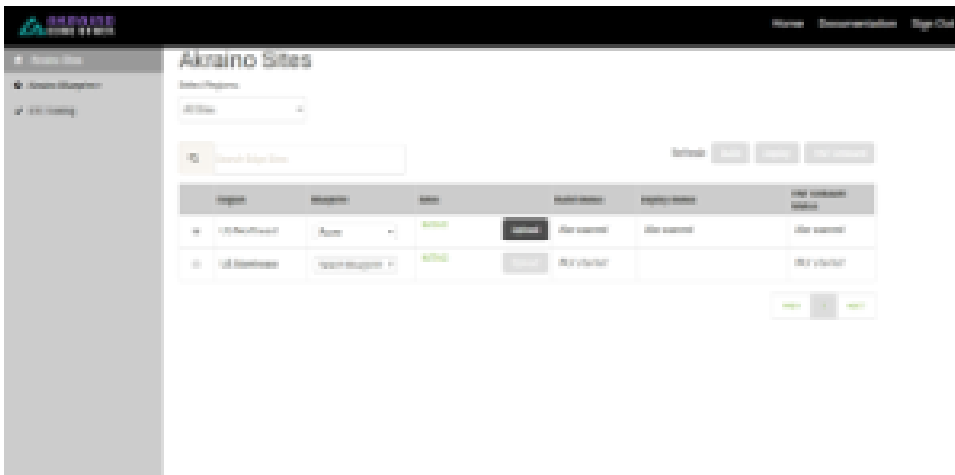


Copy and paste the below contents in to a file, and save it as rover.txt. Use this file for uploading as mentioned in step 4.d above.

Verify the configuration details as applicable to your environment. For more details refer to Appendix - Edge Site Configuration

## rover.txt

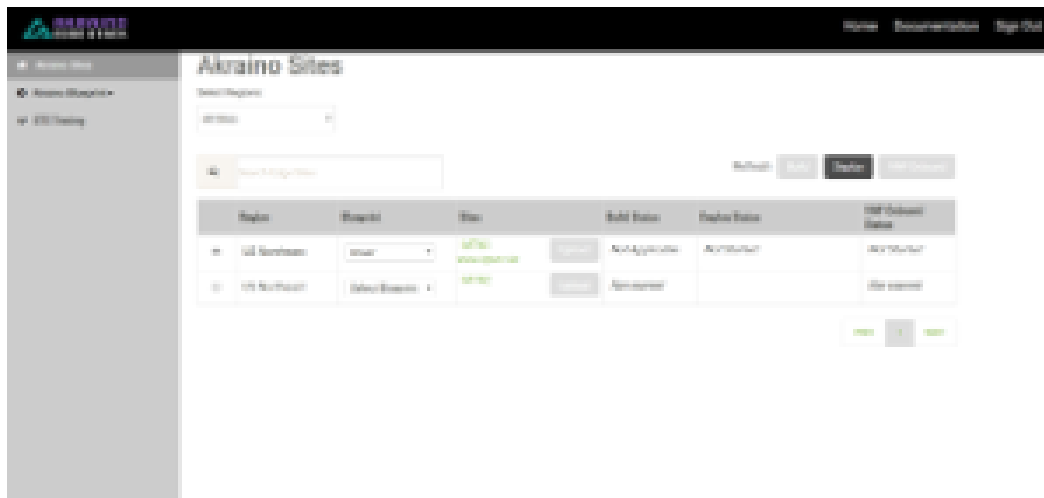
```
# Copyright 2018 AT&T Intellectual Property. All other rights reserved.
#
# Licensed under the Apache License, Version 2.0 (the "License");
# you may not use this file except in compliance with the License.
# You may obtain a copy of the License at
#
#     http://www.apache.org/licenses/LICENSE-2.0
#
# Unless required by applicable law or agreed to in writing, software
# distributed under the License is distributed on an "AS IS" BASIS,
# WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
# See the License for the specific language governing permissions and
# limitations under the License.
# Add proxy settings if required for your environment
# export http_proxy=http://your.proxy.com:8080/
# export https_proxy=http://your.proxy.com:8080/
#
# host name for server
SRV_NAME=aknode45
# server oem - Dell or HPE (case sensitive)
SRV_OEM=Dell
# out of band interface information for server (idrac/ilo/etc)
SRV_OOB_IP=192.168.41.45
SRV_OOB_USR=root
SRV_OOB_PWD=calvin
# mac address of server to be used during the build - not required for Dell servers
# SRV_MAC=3c:fd:fe:b8:10:60
# name of network interface used during build when ipxe.efi is booted and when os is booted
# ipxe numbers ports from 0-n in pci bus order.
# the netx value will depend on how many nics are in the server
# and which pci device number is assigned to the slot
SRV_IPXE_INF=net8
# the build interface is the nic used by the Ubuntu installed to load the OS
SRV_BLD_INF=enp135s0f0
# the boot device is the device name on which the OS will be loaded
SRV_BOOT_DEVICE=sdg
# ipxe script to use - based on the os version and kernel to install
# valid options are script-hwe-16.04.5-amd64.ipxe or script-16.04.5-amd64.ipxe
SRV_BLD_SCRIPT=script-hwe-16.04.5-amd64.ipxe
# template xml file to set bios and raid configuration settings
SRV_BIOS_TEMPLATE=dell_r740_g14_uefi_base.xml.template
SRV_BOOT_TEMPLATE=dell_r740_g14_uefi_httpboot.xml.template
SRV_HTTP_BOOT_DEV=NIC.Slot.7-1-1
# template to run to configure OS after first boot
# current options are: firstboot.sh.template, firstboot-genesis.sh.template or firstboot-airship-iab.sh.
template
SRV_FIRSTBOOT_TEMPLATE=firstboot.sh.template
# VLAN to use during build and for final network configuration
SRV_VLAN=41
# basic network information for dhcp config and final server network settings
SRV_MTU=9000
SRV_IP=192.168.2.45
SRV_SUBNET=192.168.2.0
SRV_NETMASK=255.255.255.0
SRV_GATEWAY=192.168.2.200
SRV_DNS=192.168.2.85
SRV_DOMAIN=lab.akraino.org
SRV_DNSSEARCH=lab.akraino.org
SRV_NTP=ntp.ubuntu.org
# root password for server being built
SRV_PWD=akraino,d
# network bond information
SRV_BOND=bond0
SRV_SLAVE1=enp135s0f0
SRV_SLAVE2=enp135s0f1
```



5. Click on Submit. This will upload the input file and the site details into the portal.

6. User will see the file uploaded successfully message in the sites column then Deploy button is enabled.

- Click on Deploy to begin the deploy process.
- This process takes about an hour.
- User can click on Refresh (link) to update the status of the deploy on the portal.
- The deploy status changes from 'Not started' to 'In progress' to 'Complete'



7. User can additionally check the log files to track the progress of edge site installation, by logging into the `regional_node_ip` via ssh, and running this command: `tail -f /var/log/akraino/scriptexecutor.log`

## Tempest Tests

### Prerequisites

*Specifics around OpenStack are beyond the scope of this guide.*

- Validate all OpenStack settings as needed.
- Ensure all necessary OpenStack services are up and running for a particular site.
- Use appropriate values for the OpenStack username, password, region, and desired timeout.

### Running Tempest

- Navigate to ETE testing page using the left navigation menu in the portal.
- Select a deployed edge site in the Run Tests page, by clicking the radio button in the GUI table displayed. This will enable the "Run Tempest" button.
- Click on "Run Tempest" to trigger the tempest test on the deployed edge site.
- Test status shows "In Progress" upon successful invocation.
- Test status gets updated to 'Complete', once the job gets completed.

## Installing ONAP

### Prerequisites

*Specifics around ONAP are beyond the scope of this guide.*

- Verify that a VLAN is created and can be used for OpenStack tenant VM
  - The VLAN ID
  - An IP (or a range of IP) that can be accessed from this VLAN
  - Gateway, DNS, for the IP
- A public private key pair for accessing ONAP VM
- If the Edge Node is behind proxy, the proxy URL
- Obtain the OpenStack keystone admin password

### Installation

1. Navigate to the Akraino Blueprint > Add-Ons page via the left navigation menu.
2. Select a deployed edge site on the *Install ONAP* page.
3. Click on Upload button (in the sites column), this will open a pop-up dialog
4. Click on Browse button, select the input file for ONAP (parameters.env file).  
The input file is a property file that stores information in `key=value` format. Sample input file used for ONAP:



Copy and paste the below contents in to a file, and save it as `parameters.env`. Use this file for uploading as mentioned in step 4 above.

Verify the configuration details as applicable to your environment. For more details refer to Appendix - ONAP Configuration

#### parameters.env

```
# Parameters that will be populated by camunda engine
parameters:

  public_net_name: public

  public_physical_net_provider_name: bond0

  provider_segmentation_id: 50

  public_physical_net_type: vlan

  public_subnet_name: public

  public_subnet_cidr: 172.24.8.0/24

  public_subnet_allocation_start: 172.24.8.221

  public_subnet_allocation_end: 172.24.8.225

  public_subnet_dns_nameserver: 8.8.8.8

  public_subnet_gateway_ip: 172.24.8.1

  flavor_name: m1.onap

  onap_vm_public_key: ssh-rsa
AAAAB3NzaClyc2EAAAADAQABAAQACwcbAk6SJxvYf4CM75JGWSQ38149Fhu4dUXUmmASFwuvPJ6sCpoGyMPQdEMEt3wITCFGfS4gw6
eQO39NUaS4JqWYjNN6sejernldwyqGwz42H
/rn7CL0xhbCq19upWF+2bm5X46UgSwZBYcLxW0BrOh+0lxkON+2qOGZFbtEcOUeOVmRSJdBuxczyGD5i6zusITJ00scqfNTCyRLm8JiH1
W9SY43iyj3Lq0cDxYQ97fKX2F+0D/JfnWPu/2v+HaJWDpfpNG/Mo
/SVzNAwE997DMY1ZD9jJsoYPr8UWypQQJUMldn3P+ERaswNTXnGbmCnwRGlj7IANnmGCc7koi6t root@cssoaiclab01-85

  http_proxy:

  https_proxy:

  no_proxy:

  keystone_admin_password: password

  onap_tenant_password: amsterdam

  onap_artifacts_http_repo:
```

5. User will see the "file uploaded successfully" message in the sites column. Then, "Install ONAP" button gets enabled.
6. Click "Install ONAP" to begin the installation.
7. The ONAP status changes from 'Not started' to 'In progress' to 'Complete'.
8. ONAP VM will be created successfully after the job completes. It may take several hours for ONAP to become operational.

## Onboarding a Sample VNF

1. Navigate to the *Akraino Sites* page via the left navigation menu.
2. Select a deployed edge site in the GUI table displayed. The **VNF Onboard** button becomes enabled.
3. Click **VNF Onboard**. This will open a Pop up dialog. Choose **VNF** as **vCDN** (Sample VNF) from the drop-down
4. Verify all the default entries as applicable to your environment.
5. Click **Onboard** to begin the sample VNF installation. This process may take few minutes to complete.
6. The VNF Onboard status changes from 'Not started' to 'In progress' to 'Complete'.

The Sample VNF creates an [Apache Traffic Server](#) cache instance and a [Locust](#) load generator client instance in the OpenStack environment for the selected site. By default, the Sample VNF will create a heat stack name ats-demo. The heat stack will contain two instances named ats-demo-client and ats-demo-server. The default configuration of the server instance is to cache the Big Buck Bunny videos from the [internet server](#) and then serve the video to the client from its ramdisk. The heat stack will output the client and server URLs. The client URL will display the Locust load generator dashboard. The server URL will allow you to play the video in a browser.

OpenStack stack output show ats-demo --all

Field	Value
client_url	{ "output_value": "http://192.168.48.223:8089/", "output_key": "client_url", "description": "URL for client" }
client_ip	{ "output_value": "192.168.48.223", "output_key": "client_ip", "description": "IP of the client" }
server_url	{ "output_value": "http://192.168.48.226:8080 /bbb_sunflower_1080p_30fps_normal.mp4", "output_key": "server_url", "description": "URL for server" }
server_ip	{ "output_value": "192.168.48.226", "output_key": "server_ip", "description": "IP of the server" }

 VNF can also be on-boarded using ONAP. Refer the [documentation](#).

## Appendix

### Edge Site Configuration - Rover (Single-Node Cluster)

This configuration file is written as a series of shell key/value assignments.

Sample input file template with all required parameters are provided in the 'Build or Deploy an Edge Node' section.

Key Name(s)	Notes	Example
SRV_NAME	Server hostname	SRV_NAME=aknode45
SRV_OOB_IP SRV_OOB_USR SRV_OOB_PWD	Out-of-band interface information for the server (iDRAC, ilo, etc.)	SRV_OOB_IP=192.168.41.45 SRV_OOB_USR=root SRV_OOB_PWD=XXXXXXXX
SRV_MAC	MAC address of the server used during the build	SRV_MAC=3c:fd:fe:b8:02:90
SRV_OEM	Server OEM: Dell or HPE (case sensitive)	SRV_OEM=Dell
SRV_IPXE_INF SRV_BLD_INF SRV_BOOT_DEVICE	Network interface used during the build when ipxe.efi and the OS are booted	SRV_IPXE_INF=net8 SRV_BLD_INF=enp135s0f0 SRV_BOOT_DEVICE=sdg
SRV_BLD_SCRIPT	ipxe script based on the OS version and target kernel. Valid values are script-hwe-16.04.4-amd64.ipxe or script-16.04.4-amd64.ipxe	SRV_BLD_SCRIPT=script-hwe-16.04.5-amd64.ipxe

SRV_BIOS_TEMPLATE SRV_BOOT_TEMPLATE SRV_HTTP_BOOT_DEV	XML template used to set BIOS and RAID configuration.	SRV_BIOS_TEMPLATE=dell_r740_g14_uefi_base.xml.template SRV_BOOT_TEMPLATE=dell_r740_g14_uefi_httpboot.xml.template SRV_HTTP_BOOT_DEV=NIC.Slot.7-1-1
SRV_FIRSTBOOT_TEMPLATE	Template for script to run on first boot to setup the server. Current options are:  firstboot.sh.template firstboot-genesis.sh.template firstboot-airship-iab.sh.template	SRV_FIRSTBOOT_TEMPLATE=firstboot.sh.template
SRV_VLAN	VLAN to use during the build and final network configuration	SRV_VLAN=41
SRV_MTU SRV_IP SRV_SUBNET SRV_NETMASK SRV_GATEWAY SRV_DNS SRV_DOMAIN SRV_DNSS EARCH SRV_NTP	Basic network information for DHCP configuration and final server network settings	SRV_MTU=9000 SRV_IP=192.168.2.45 SRV_SUBNET=192.168.2.0 SRV_NETMASK=255.255.0 SRV_GATEWAY=192.168.2.200 SRV_DNS=192.168.2.85 SRV_DOMAIN=lab.akraino.org SRV_DNSSEARCH=lab.akraino.org SRV_NTP=ntp.ubuntu.org
SRV_PWD	Root password for the server being built	SRV_PWD=XXXXXXXX
SRV_BOND  SRV_SLAVE1  SRV_SLAVE2	Network bond information	SRV_BOND=bond0 SRV_SLAVE1=enp135s0f0 SRV_SLAVE2=enp135s0f1

## Create New Edge Site locations



The Akraino seed code comes with default two sites: MTN1, MTN2 representing two lab sites in Middletown, NJ. This step of connecting to the database and creating edge\_site records are only required if the user wishes to deploy on other sites.

To deploy a Rover (Single-Node Cluster) Edge Node, perform the following steps:

- Check if the Akraino (Docker Containers) packages are stood up.
- Connect to PostgreSQL database providing the host IP (name).

```
jdbc:postgresql://<IP-address-of-DB-host>:6432/postgres
user name = admin
password = abc123
```



use 'pgAdmin |||' Postgres client tool or connect to Postgres DB using SQL interface

- Execute the following SQL insert, bearing in mind these value substitutions:
  - edge\_site\_id: Any unique increment value. This is usually 1 but does not have to be.
  - edge\_site\_name: Human-readable Edge Node name.
  - region\_id: Edge Node region number. Use `select * from akraino.Region;` to determine the appropriate value. Observe the region number associations returned from the query: Use 1 for *US East*, 2 for *US West*, and so on.



```
> insert into akraino.edge_site(edge_site_id, edge_site_name, crt_login_id, crt_dt, upd_login_id, upd_dt,
region_id)
values( 1, 'Atlanta', user, now(), user, now(),1);
```

## ONAP Configuration

This configuration file is written as a YAML dictionary named `parameters`.

This dictionary will be selectively inserted into the ONAP VM environment file, depending on overall configuration.

Key Name	Notes	Example
public_net_name	The name assigned to the OpenStack network that will be created and used by the ONAP VM. An existing network may be used by referencing its name here.	public_net_name: public
public_physical_net_provider_name	The physical provider network name for the public network. <b>CAUTION:</b> If the physical provider network cannot be found, the automated deployment process will terminate with an error.	# Assume vlan50 is the VLAN created # for the OpenStack Project (tenant)  public_physical_net _provider_name: vlan50
provider_segmentation_id	The VLAN tag of the physical provider network	# Assume vlan50  provider_segmentati on_id: 50
public_physical_net_type	The physical network type. Specify VLAN or flat. <b>NOTE:</b> When flat is in use, provider_segmentation_id will be ignored.	public_physical_net _type: vlan
public_subnet_name	The subnet name. An existing subnet may be used by referencing its name here.	public_subnet_name: public-subnet
public_subnet_cidr	The subnet's CIDR. The ONAP VM will be assigned an IP within this subnet.	public_subnet_cidr: 192.168.102.0/24
public_subnet_allocation_start	The allocation start of the IP pool. Together with public_subnet_allocation_end it defines the range of IPs assigned to VMs.	public_subnet_all ocation_start: 192.168.102.100
public_subnet_allocation_end	The allocation end of the IP pool. Together with public_subnet_allocation_start it defines the range of IPs assigned to VMs.	public_subnet_alloc ation_end: 192.168.102.200
public_subnet_dns_name_server	The subnet's DNS server	public_subnet_dns_n ameserver: 8.8.8.8
public_subnet_gateway_ip	The subnet's Gateway IP	public_subnet_gatew ay_ip: 192.168.102.1
flavor_name	VM flavor for the ONAP VM. The installation creates m1.onap, x1.onap, xx1.onap flavors, all of which are recommended for use.	flavor_name: x1. onap

onap_vm_public_key	The public key used to access the ONAP VM. A URL pointing to the key may be used here.	onap_vm_public_key: PUBLIC_KEY
http_proxy	Optional http proxy URL including port. If the network is accessible without a proxy, please leave empty.	http_proxy: http://proxy. yourdomain.com:8888
https_proxy	Optional https proxy URL including the port. If the network is accessible without a proxy, please leave empty.	https_proxy: https://proxy. yourdomain.com:8888
no_proxy	Optional list of domains, IPs, and CIDRs that do not require a proxy, separated by commas. Do not use spaces. If the network is accessible without a proxy, please leave empty.	no_proxy: 127.0.0.1
keystone_admin_password	The keystone admin password.	keystone_admin_password: XXXXXXXX
onap_tenant_password	The keystone password for the ONAP project (formerly known as a <i>tenant</i> in OpenStack parlance).	onap_tenant_password: XXXXXXXX
onap_artifacts_http_repo	Optional HTTP repository URL for ONAP artifacts. When deploying a self-contained Edge Node without Internet access, all ONAP artifacts must be downloaded from ONAP Nexus to a HTTP server, using this URL. If HTTP is not being used to download artifacts, please leave empty.	onap_artifacts_http_repo: http://192.168.102.220/onap