

Network Cloud Family Akraino Release 1

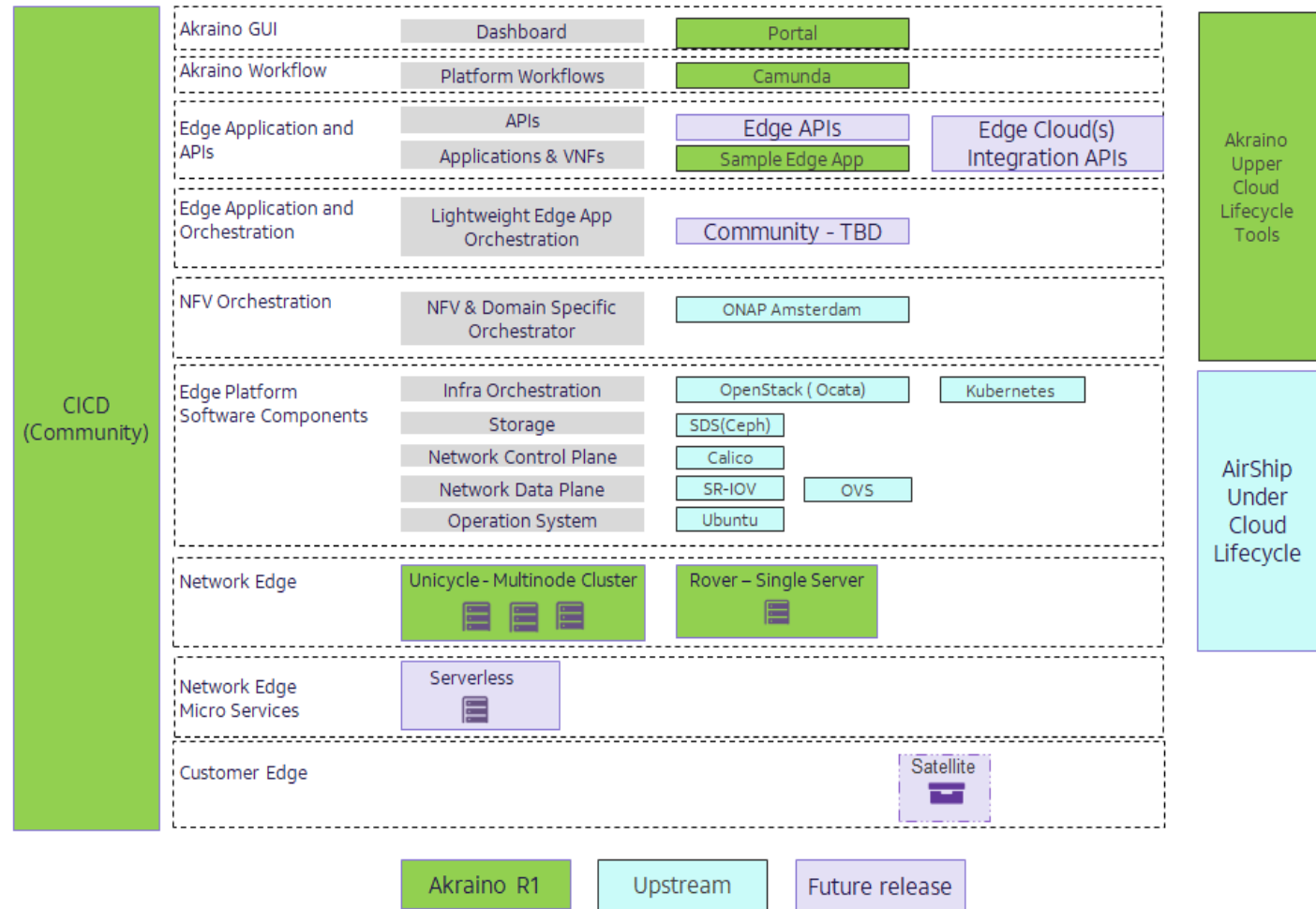
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PTL for Rover and Unicycle with SR-IOV Blueprints



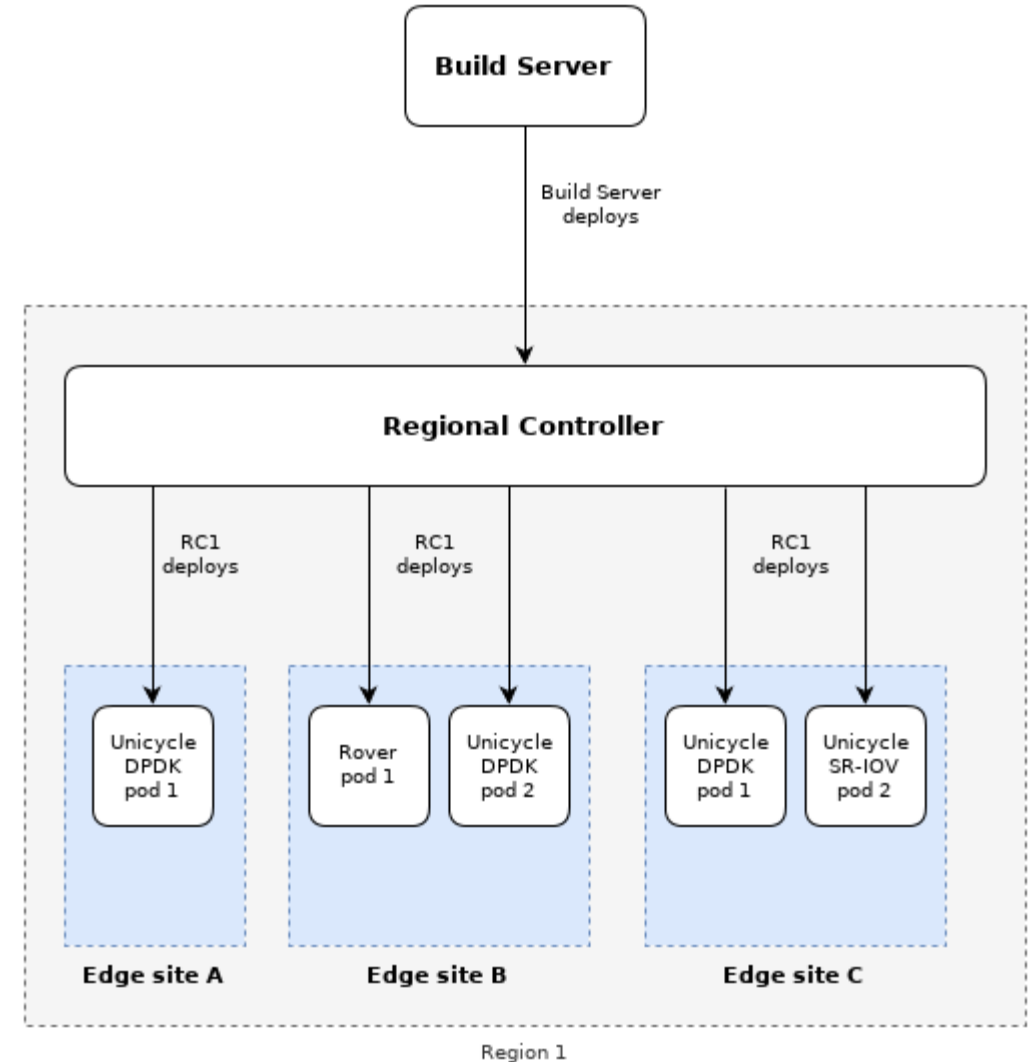
Network Cloud Family Overview

- › Automates deployment of Openstack
 - › Rover – single server
 - › Unicycle – three to seven servers
- › Akraino Release 1 automation will:
 - › Apply BIOS and RAID settings to servers
 - › Deploy operating system
 - › Deploy OpenStack using Airship with designated data plane (SR-IOV or OVS-DPDK)
- › Allows users to deploy complex virtual network functions using their preferred orchestration:
 - › ONAP
 - › OpenStack Heat templates
 - › Other OpenStack APIs



Deployment Overview

- › Build physical network
- › Cable servers and configure OOB (iDrac/iLO)
- › Deploy Regional Controller
 - › Can run on virtual machine or bare metal
 - › Build server only used to deploy on bare metal
- › Create edge site configuration file
 - › Defines hardware settings, network details, and other configuration options
 - › Single file for each edge site
- › Deploy edge site using Regional Controller



Regional Controller

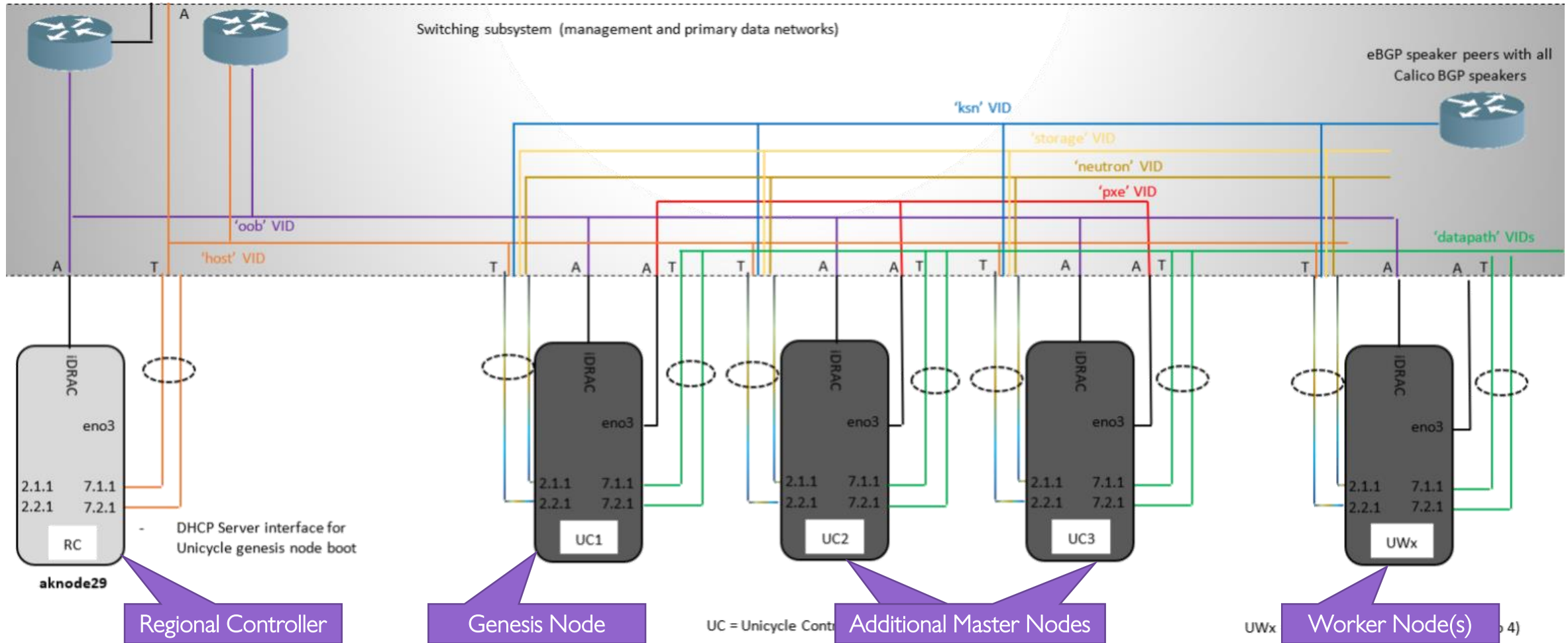
- › Web portal to perform tasks
- › Workflow engine to orchestrate tasks
- › Support services
 - › Software repository
 - › DHCP
 - › LDAP
 - › Postgress DB

The screenshot displays the Akraino Edge Stack web portal. The page title is 'Akraino Sites'. Below the title, there is a 'Select Regions:' dropdown menu set to 'All Sites'. A search bar labeled 'Search Edge Sites' is present, along with 'Refresh', 'Build', 'Deploy', and 'VNF Onboard' buttons. The main content is a table with the following columns: Region, Blueprint, Sites, Build Status, Deploy Status, and VNF Onboard Status. The table contains four rows of data for 'US Northeast' sites.

Region	Blueprint	Sites	Build Status	Deploy Status	VNF Onboard Status
US Northeast	Select Blueprint	MTN1 Upload	Not started		Not started
US Northeast	Select Blueprint	MTN2 Upload	Not started		Not started
US Northeast	Unicycle	MTN3 View input File Upload	Not Started	Tar file status: Not Started Genesis Node status: Not Started Deploy site status: Not Started Overall status: Not Started	Not Started
US Northeast	Select Blueprint	MTN4 Upload	Not started		Not started

At the bottom right of the table, there are navigation buttons: 'PREV', '1', and 'NEXT'.

Unicycle w/ SR-IOV Network Architecture Example



Unicycle w/ SR-IOV Configuration File Example

General Settings

```
---
site_name: edgесite1
site_type: sriov
ipmi_admin:
  username: root
  password: XXXXXXXX
```

Data Plane/GPU Settings

```
gpu:
  alias:
    - name: "V100"
      product_id: "1db4"
      vendor_id: "10de"
sriov:
  alias:
    - name: "numa0"
      product_id: "158b"
      vendor_id: "8086"
nets:
  - physical: sriovnet1
    interface: enp135s0f0
    vlan_start: 2001
    vlan_end: 3000
    whitelists:
      - "address": "0000:87:02.*"
      - "address": "0000:87:03.*"
      - "address": "0000:87:04.*"
      - "address": "0000:87:05.*"
  - physical: sriovnet2
    interface: enp135s0f1
    vlan_start: 2001
    vlan_end: 3000
    whitelists:
      - "address": "0000:87:0a.*"
      - "address": "0000:87:0b.*"
      - "address": "0000:87:0b.*"
      - "address": "0000:87:0d.*"
```

Network Settings

```
networks:
  bonded: yes
  primary: bond0
  slaves:
    - name: enp94s0f0
    - name: enp94s0f1
oob:
  vlan: 40
  interface:
  cidr: 192.168.41.0/24
  routes:
    gateway: 192.168.41.1
  ranges:
    reserved:
      start: 192.168.41.2
      end: 192.168.41.12
    static:
      start: 192.168.41.13
      end: 192.168.41.254
host:
  vlan: 41
  interface: bond0.41
  cidr: 192.168.2.0/24
  routes:
    gateway: 192.168.2.200
  ranges:
    reserved:
      start: 192.168.2.84
      end: 192.168.2.86
    static:
      start: 192.168.2.40
      end: 192.168.2.45
```

```
storage:
  vlan: 42
  interface: bond0.42
  cidr: 172.31.2.0/24
  ranges:
    reserved:
      start: 172.31.2.1
      end: 172.31.2.10
    static:
      start: 172.31.2.11
      end: 172.31.2.254
pxe:
  vlan: 43
  interface: eno3
  cidr: 172.30.2.0/24
  gateway: 172.30.2.1
  routes:
    gateway: 172.30.2.40
  ranges:
    reserved:
      start: 172.30.2.2
      end: 172.30.2.10
    static:
      start: 172.30.2.11
      end: 172.30.2.200
  dhcp:
    start: 172.30.2.201
    end: 172.30.2.254
```

```
kns:
  vlan: 44
  interface: bond0.44
  cidr: 172.29.1.0/24
  local_asnumber: 65531
  ranges:
    static:
      start: 172.29.1.5
      end: 172.29.1.254
  additional_cidrs:
    - 172.29.1.128/29
  ingress_cidr: 172.29.1.129/32
  peers:
    - ip: 172.29.1.1
      scope: global
      asnumber: 65001
  vrrp_ip: 172.29.1.1
neutron:
  vlan: 45
  interface: bond0.45
  cidr: 10.0.102.0/24
  ranges:
    reserved:
      start: 10.0.102.1
      end: 10.0.102.10
    static:
      start: 10.0.102.11
      end: 10.0.102.254
dns:
  upstream_servers:
    - 192.168.2.85
    - 8.8.8.8
    - 8.8.4.4
  ingress_domain:
  dellgen10.akraino.org
  domain: lab.akraino.org
```

Unicycle w/ SR-IOV Configuration File Example (cont)

Storage Settings

```
storage:
  osds:
    - data: /dev/sda
      journal: /var/lib/ceph/journal/journal-sda
    - data: /dev/sdb
      journal: /var/lib/ceph/journal/journal-sdb
    - data: /dev/sdc
      journal: /var/lib/ceph/journal/journal-sdc
    - data: /dev/sdd
      journal: /var/lib/ceph/journal/journal-sdd
    - data: /dev/sde
      journal: /var/lib/ceph/journal/journal-sde
    - data: /dev/sdf
      journal: /var/lib/ceph/journal/journal-sdf
  osd_count: 6
  total_osd_count: 18

disks:
  - name : sdg
    labels:
      bootdrive: 'true'
    partitions:
      - name: root
        size: 20g
        mountpoint: /
      - name: boot
        size: 1g
        mountpoint: /boot
      - name: var
        size: 100g
        mountpoint: /var
  - name : sdh
    partitions:
      - name: ceph
        size: 300g
        mountpoint: /var/lib/ceph/journal
```

```
disks_compute:
  - name : sdg
    labels:
      bootdrive: 'true'
    partitions:
      - name: root
        size: 20g
        mountpoint: /
      - name: boot
        size: 1g
        mountpoint: /boot
      - name: var
        size: '>300g'
        mountpoint: /var
  - name : sdh
    partitions:
      - name: nova
        size: '99%'
        mountpoint: /var/lib/nova
```

Server Settings

```
genesis:
  name: aknode40
  oob: 192.168.41.40
  host: 192.168.2.40
  storage: 172.31.2.40
  pxe: 172.30.2.40
  ksn: 172.29.1.40
  neutron: 10.0.102.40
  root_password: XXXXX
masters:
  - name : aknode41
    oob: 192.168.41.41
    host: 192.168.2.41
    storage: 172.31.2.41
    pxe: 172.30.2.41
    ksn: 172.29.1.41
    neutron: 10.0.102.41
  - name : aknode42
    oob: 192.168.41.42
    host: 192.168.2.42
    storage: 172.31.2.42
    pxe: 172.30.2.42
    ksn: 172.29.1.42
    neutron: 10.0.102.42
#workers:
# - name : aknode43
#   oob: 192.168.41.43
#   host: 192.168.2.43
#   storage: 172.31.2.43
#   pxe: 172.30.2.43
#   ksn: 172.29.1.43
#   neutron: 10.0.102.43
```

Hardware Settings

```
platform:
  vcpu_pin_set: "4-21,26-43,48-65,72-87"
  kernel_params:
    hugepagesz: '1G'
    hugepages: 32
    transparent_hugepage: 'never'
    iommu: 'pt'
    intel_iommu: 'on'
    amd_iommu: 'on'

hardware:
  vendor: DELL
  generation: '10'
  hw_version: '3'
  bios_version: '2.8'
  bios_template:
  dell_r740_g14_uefi_base.xml.template
  boot_template:
  dell_r740_g14_uefi_httpboot.xml.template
  http_boot_device: NIC.Slot.2-1-1

genesis_ssh_public_key: "ssh-rsa XXXXX"

kubernetes:
  api_service_ip: 10.96.0.1
  etcd_service_ip: 10.96.0.2
  pod_cidr: 10.98.0.0/16
  service_cidr: 10.96.0.0/15
regional_server:
  ip: 135.16.101.85
...
```

Site Deployment Steps

1. Chose target site
2. Choose Blueprint (Rover or Unicycle)
3. Upload config file (dataplane is defined by values in the file)
4. Choose Build (generates detailed Airship config files)
5. Choose Deploy (begins install)
6. Choose Refresh
7. Monitor progress

The screenshot shows the Akraino Edge Stack management interface. The main content area displays a table of sites with columns for Region, Blueprint, Sites, Build Status, Deploy Status, and VNF Onboard Status. The table contains four rows of site information. The third row is highlighted with a red circle labeled '3' on the 'Upload' button. The 'Deploy Status' column for the third row shows a red circle labeled '7' next to the text 'Overall status: Not Started'. The control panel at the top right includes buttons for Refresh, Build, Deploy, and VNF Onboard, with red circles labeled '6', '4', and '5' above them. The sidebar on the left shows navigation options for Akraino Sites, Akraino Blueprint, and ETE Testing.

Region	Blueprint	Sites	Build Status	Deploy Status	VNF Onboard Status
US Northeast	Select Blueprint	MTN1	Not started		Not started
US Northeast	Select Blueprint	MTN2	Not started		Not started
US Northeast	Unicycle	MTN3 View input File	Not Started	Tar file status: Not Started Genesis Node status: Not Started Deploy site status: Not Started Overall status: Not Started	Not Started
US Northeast	Select Blueprint	MTN4	Not started		Not started

Akraino Release Planning

- › Thank you to everyone that contributed to Release 1!
 - › AT&T, Ericsson, NTT, Juniper, Radisys and many others
- › The community is evaluating enhancements for Akraino Release 2 including:
 - › Update to latest release of Airship
 - › Update to Dublin release of ONAP
 - › Migrate to new Regional Controller API server
 - › Migrate to new Regional Controller Portal feature project
- › The community needs your input and contributions to continue to mature!
- › Network Cloud Rover/Unicycle/OVS-DPDK Weekly Meeting
- › Time: Every Monday @ 10:00 AM Eastern Time
- › Join Zoom Meeting: <https://zoom.us/j/367421865>

References

- › Project wiki

- › <https://wiki.akraino.org/display/AK/R1+Network+Cloud+Blueprints>

- › Airship

- › <https://www.airshipit.org/>

- › OpenStack-Helm

- › <https://github.com/openstack/openstack-helm>