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本手順は Contrail Command から Contrail Contrail Controller(1912)、Contrail Insight(Appformix)、K8S をインストールする手順となる。

最新 Version の Install は本手順を参考に以下を参照下さい

[https://www.juniper.net/documentation/en\\_US/contrail20/information-products/pathway-pages/contrail-install-and-upgrade-guide.html](https://www.juniper.net/documentation/en_US/contrail20/information-products/pathway-pages/contrail-install-and-upgrade-guide.html)

Contrail Version 毎に Supported SW Version は異なっているため、以下の通りインストールする必要がある

[https://www.juniper.net/documentation/en\\_US/release-independent/contrail/topics/reference/contrail-supported-platforms.pdf](https://www.juniper.net/documentation/en_US/release-independent/contrail/topics/reference/contrail-supported-platforms.pdf)

### 環境情報 :

#### Network:

Mgmt - 192.168.0.0/24

Data - 192.168.1.0/24

#### Server:

Contrail Command : 192.168.0.2

Contrail Controller/Service Node : 192.168.0.3 / 192.168.1.3

Appformix : 192.168.0.4 / 192.168.1.4

Appformix Flow : 192.168.0.5 / 192.168.1.5

K8S Master : 192.168.0.6 / 192.168.1.6

K8S Worker1 : 192.168.0.7 / 192.168.1.7

K8S Worker2 : 192.168.0.8 / 192.168.1.8

### Step0: OS Install

上記 7 台のサーバに CentOS 7 をインストールし、IP Address 設定、SELINUX Permissive、Yum Update を実施。

本手順では割愛する

### Step1: Contrail Command Install

#### Docker Install

```
yum install -y yum-utils device-mapper-persistent-data lvm2
yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
yum install -y docker-ce-18.06.0.ce
systemctl enable docker
systemctl start docker
```

Contrail Image Download のため、hub.juniper.net に login

```
docker login hub.juniper.net --username xxxx --password xxxx
```

以下で使用可能な Tag を確認(今回は 1912.32 を使用)

```
curl https://xxxx:xxxx@hub.juniper.net/v2/contrail/contrail-command/tags/list
```

## Contrail Image Download

```
docker pull hub.juniper.net/contrail/contrail-command-deployer:1912.32
```

## Appformix 準備

```
mkdir /opt/software  
mkdir /opt/software/appformix  
mkdir /opt/software/xflow
```


/opt/software/xflow に以下の Image を保存

```
appformix-flows-ansible-1.0.6.tar.gz  
appformix-flows-1.0.6.tar.gz
```

/opt/software/appformix に以下の Image を保存

```
appformix-3.1.11.tar.gz  
appformix-dependencies-images-3.1.11.tar.gz  
appformix-kubernetes-images-3.1.11.tar.gz  
appformix-lxc-images-3.1.11.tar.gz  
appformix-network_device-images-3.1.11.tar.gz  
appformix-openstack-images-3.1.11.tar.gz  
appformix-platform-images-3.1.11.tar.gz
```

/opt/software/ppformix に License を保存

```
appformix-internal-kubernetes-3.1.sig
```

Appformix, AppformixFlow と Contrail の Version Compatibility は以下を参照

<https://ssd-git.juniper.net/appformix/AppFormix/wikis/AppFormix-installation-via-Contrail-Command>

<https://ssd-git.juniper.net/appformix/AppFormix/wikis/AppFormix-Flows>

command\_servers.yml を作成

```
---  
user_command_volumes:  
- /opt/software/appformix:/opt/software/appformix  
- /opt/software/xflow:/opt/software/xflow  
command_servers:  
server1:  
  ip: 192.168.0.2  
  connection: ssh  
  ssh_user: root  
  ssh_pass: contrail123  
  sudo_pass: contrail123  
  ntpserver: 210.173.160.27  
  registry_insecure: false  
  container_registry: hub.juniper.net/contrail
```

```

container_tag: "1912.32"
container_registry_username: xxxx
container_registry_password: xxxx
config_dir: /etc/contrail

contrail_config:
  database:
    type: postgres
    dialect: postgres
    password: contrail123
  keystone:
    assignment:
      data:
        users:
          admin:
            password: contrail123
  insecure: true
  no_auth: true
  auth_type: basic-auth
  client:
    password: contrail123

```

<-k8s をインストールする場合必要  
<-k8s をインストールする場合必要

Contrail Command Install

```

docker run -td --net host -v /root/command_servers.yml:/command_servers.yml --privileged --name contrail_command_deployer hub.juniper.net/contrail/contrail-command-deployer:1912.32

```

Install 状況を以下で確認

```

docker logs -f contrail_command_deployer

```

以下のように failed が 0 であれば Install 完了

```

PLAY RECAP *****
192.168.0.2      :ok=51  changed=29  unreachable=0  failed=0
localhost      :ok=4   changed=2   unreachable=0  failed=0

```

以下のように contrail\_psql, contrail\_command\_deployer が Up していることを確認

```

[root@command ~]# docker ps
CONTAINER ID   IMAGE                                COMMAND                                CREATED
STATUS        PORTS          NAMES                                COMMAND                                CREATED
a060eab2baec   circleci/postgres:10.3-alpine       "docker-entrypoint.s..." 2 minutes
ago          Up 2 minutes  contrail_psql                        "docker-entrypoint.s..." 2 minutes
beaae205299a   hub.juniper.net/contrail-command-deployer:1912.32  "/entrypoint.sh
/bin..." 4 minutes ago  Up 4 minutes  contrail_command_deployer          "/entrypoint.sh
/bin..." 4 minutes ago

```

Step2: Contrail Cluster, K8S Install

ここからは Contrail Command に GUI アクセスし、必要な設定を行う

<https://192.168.0.2:9091>



## Log in

Select Cluster

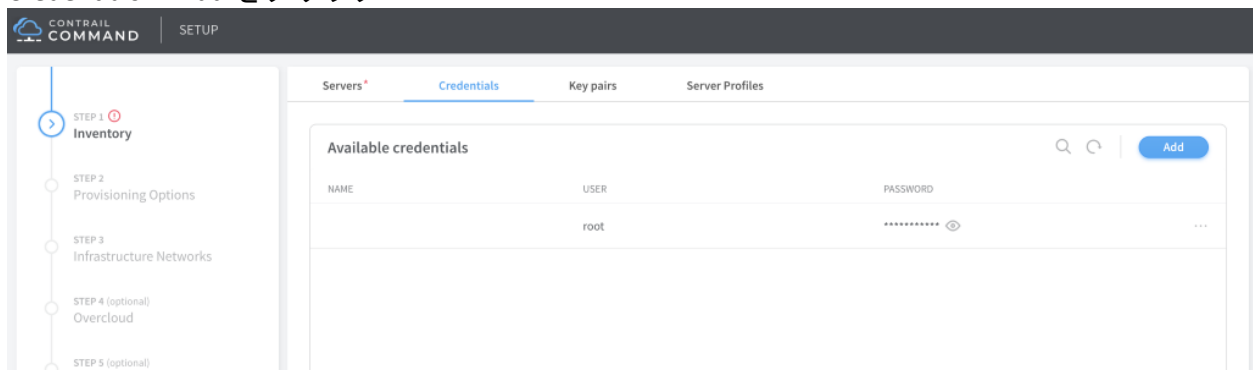
Username

Password

[Log in](#)

### Step2.1 Credential 登録

Credentials -> Add をクリック



user/pass = root/contrail123 の Credential を作成

rs Credentials Key pairs Server Profiles

## Add

Name

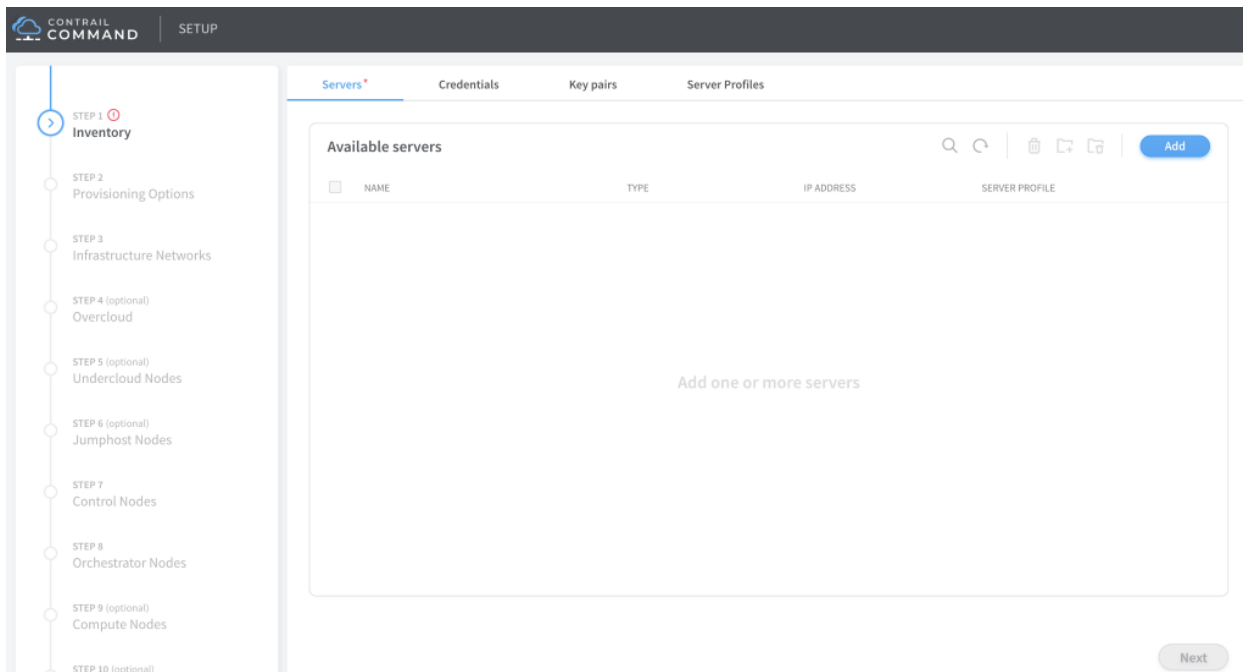
SSH User

SSH Password

Key Pair

[Cancel](#) [Add](#)

Step2.2 インベントリ登録  
Servers -> Add をクリック



Contrail Controllerのインベントリを作成

☑Hostname: contrail , Credential: root, eth0: 192.168.0.3 , eth1: 192.168.1.3

### Create Server

Choose Mode\*  Express  Detailed  Bulk Import (csv)

Select workload type this server will be used for  Physical/Virtual Node  Baremetal

Hostname\*  Management IP\*  Management Interface

Credentials

Disk Partition(s)

#### Network Interfaces

Name*	IP Address*	
<input type="text" value="eth0"/>	<input type="text" value="192.168.0.3"/>	▼ ▲ 🗑️

### Create Server

Credentials  
root

Disk Partition(s)  
vda, vdb

#### Network Interfaces

Name *	IP Address *		
eth0	192.168.0.3	▼ ▲	🗑️
eth1	192.168.1.3	▼ ▲	🗑️

+ Add

Cancel Create

上記同様に以下のインベントリを作成

Hostname: **appformix**, Credential: **root**, **eth0: 192.168.0.4**, **eth1: 192.168.1.4**

Hostname: **appformix-flow**, Credential: **root**, **eth0: 192.168.0.5**, **eth1: 192.168.1.5**

Hostname: **k8s-master**, Credential: **root**, **eth0: 192.168.0.6**, **eth1: 192.168.1.6**

Hostname: **k8s-worker1**, Credential: **root**, **eth0: 192.168.0.7**, **eth1: 192.168.1.7**

Hostname: **k8s-worker2**, Credential: **root**, **eth0: 192.168.0.8**, **eth1: 192.168.1.8**

### Create Server

Credentials

Disk Partition(s)

**Network Interfaces**

Name*	IP Address*	
<input type="text" value="eth0"/>	<input type="text" value="192.168.0.3"/>	▼ ▲ 🗑️
Name*	IP Address*	
<input type="text" value="eth1"/>	<input type="text" value="192.168.1.3"/>	▼ ▲ 🗑️

[+ Add](#)

### Step2.3 Provisioning Option

Container Registry Username: **xxxx**

Container Registry Password: **xxxx**

NTP Server: **210.173.160.27**

Contrail Version: **1912.32**

CONTROL\_NODES: **192.168.1.3** <--- Contrail Controller の DataPlaneInterface IP

PHYSICAL\_INTERFACE: **eth1** <--- Contrail Controller の DataPlaneInterface Name

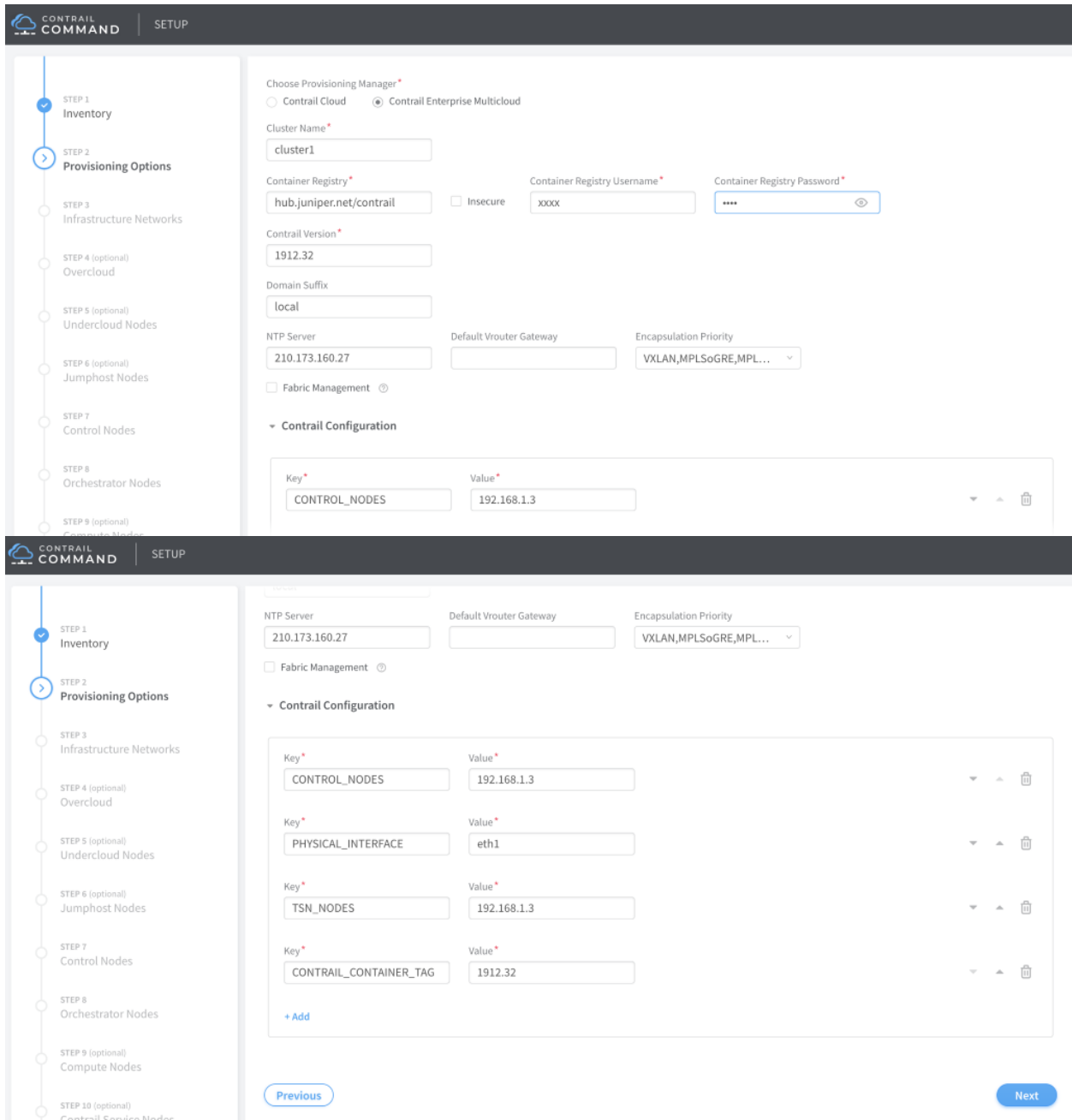
TSN\_NODES: **192.168.1.3** <---- Contrail Service Node の DataPlaneInterface IP(今回は

Contrail Controller と同居)

CONTRAIL\_CONTAINER\_TAG: **1912.32**

DEVICE\_MANAGER\_\_KEYSTONE\_\_admin\_password: **contrail123** <--OpenStack 環境ではない場合に  
**必須**

API\_\_KEYSTONE\_\_admin\_password: **contrail123** <--OpenStack 環境ではない場合に**必須**



## Step2.4 Control Node

Contrail Controller 用 Server を Assigned Control nodes へ移行  
 ※Role は自動で付与される

CONTRAIL COMMAND | SETUP

STEP 1 Inventory  
STEP 2 Provisioning Options  
STEP 3 (optional) Infrastructure Networks  
STEP 4 (optional) Overcloud  
STEP 5 (optional) Undercloud Nodes  
STEP 6 (optional) Jumpost Nodes  
STEP 7 Control Nodes

High availability mode  Manage vCenter

Available servers

HOSTNAME	IP ADDRESS	DISK PARTITION
appmix-flow	192.168.0.5	>
appmix	192.168.0.4	>
k8s-worker1	192.168.0.7	>
k8s-master	192.168.0.6	>
k8s-worker2	192.168.0.8	>

Assigned Control nodes

HOSTNAME	IP ADDRESS	DISK PARTITION
contrail	192.168.0.3	>

Roles\*

- contrail\_config\_node x
- contrail\_config\_database\_node x
- contrail\_analytics\_node x
- contrail\_analytics\_alarm\_node x
- contrail\_analytics\_snmp\_node x
- contrail\_analytics\_database\_node x

CONTRAIL COMMAND | SETUP

STEP 1 Inventory  
STEP 2 Provisioning Options  
STEP 3 (optional) Infrastructure Networks  
STEP 4 (optional) Overcloud  
STEP 5 (optional) Undercloud Nodes  
STEP 6 (optional) Jumpost Nodes  
STEP 7 Control Nodes

High availability mode  Manage vCenter

Available servers

HOSTNAME	IP ADDRESS	DISK PARTITION
appmix-flow	192.168.0.5	>
appmix	192.168.0.4	>
k8s-worker1	192.168.0.7	>
k8s-master	192.168.0.6	>
k8s-worker2	192.168.0.8	>

Assigned Control nodes

HOSTNAME	IP ADDRESS	DISK PARTITION
contrail	192.168.0.3	>

Roles\*

- contrail\_config\_node x
- contrail\_config\_database\_node x
- contrail\_analytics\_node x
- contrail\_analytics\_alarm\_node x
- contrail\_analytics\_snmp\_node x
- contrail\_analytics\_database\_node x
- contrail\_control\_node x
- contrail\_webui\_node x

## Step2.5 Orchestrator Node

Orchestrator Type: Kubernetes

Assigned Kubernetes nodes に k8s-master, k8s-worker を移行

Role は以下に設定

K8s-master : kubernetes\_master\_node, kubernetes\_kubemanager\_node

K8s-worker : kubernetes\_node

CONTRAIL COMMAND | SETUP

STEP 4 (optional) Overcloud  
STEP 5 (optional) Undercloud Nodes  
STEP 6 (optional) JumpHost Nodes  
STEP 7 Control Nodes  
STEP 8 **Orchestrator Nodes**  
STEP 9 (optional) Compute Nodes  
STEP 10 (optional) Contrail Service Nodes

Orchestrator type\*  
Kubernetes

Available servers

HOSTNAME	IP ADDRESS	DISK PARTITION
appformix-flow	192.168.0.5	>
appformix	192.168.0.4	>
contrail	192.168.0.3	>

Assigned Kubernetes nodes

HOSTNAME	IP ADDRESS	DISK PARTITION
k8s-master	192.168.0.6	>
Roles*		
kubernetes_master_node × kubernetes_kubemanager_node ×		
k8s-worker1	192.168.0.7	>

CONTRAIL COMMAND | SETUP

STEP 4 (optional) Overcloud  
STEP 5 (optional) Undercloud Nodes  
STEP 6 (optional) JumpHost Nodes  
STEP 7 Control Nodes  
STEP 8 **Orchestrator Nodes**  
STEP 9 (optional) Compute Nodes  
STEP 10 (optional) Contrail Service Nodes

Orchestrator type\*  
Kubernetes

Available servers

HOSTNAME	IP ADDRESS	DISK PARTITION
appformix-flow	192.168.0.5	>
appformix	192.168.0.4	>
contrail	192.168.0.3	>

Assigned Kubernetes nodes

HOSTNAME	IP ADDRESS	DISK PARTITION
kubernetes_kubemanager_node ×		
k8s-worker1	192.168.0.7	>
Roles*		
kubernetes_node ×		
k8s-worker2	192.168.0.8	>

CONTRAIL COMMAND | SETUP

STEP 4 (optional) Overcloud  
STEP 5 (optional) Undercloud Nodes  
STEP 6 (optional) JumpHost Nodes  
STEP 7 Control Nodes  
STEP 8 **Orchestrator Nodes**  
STEP 9 (optional) Compute Nodes  
STEP 10 (optional) Contrail Service Nodes

Orchestrator type\*  
Kubernetes

Available servers

HOSTNAME	IP ADDRESS	DISK PARTITION
appformix-flow	192.168.0.5	>
appformix	192.168.0.4	>
contrail	192.168.0.3	>

Assigned Kubernetes nodes

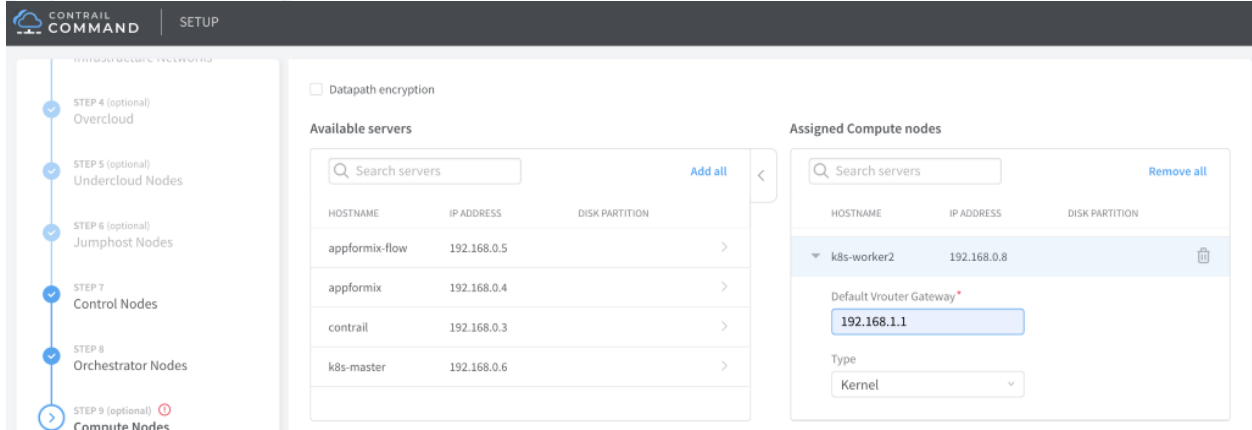
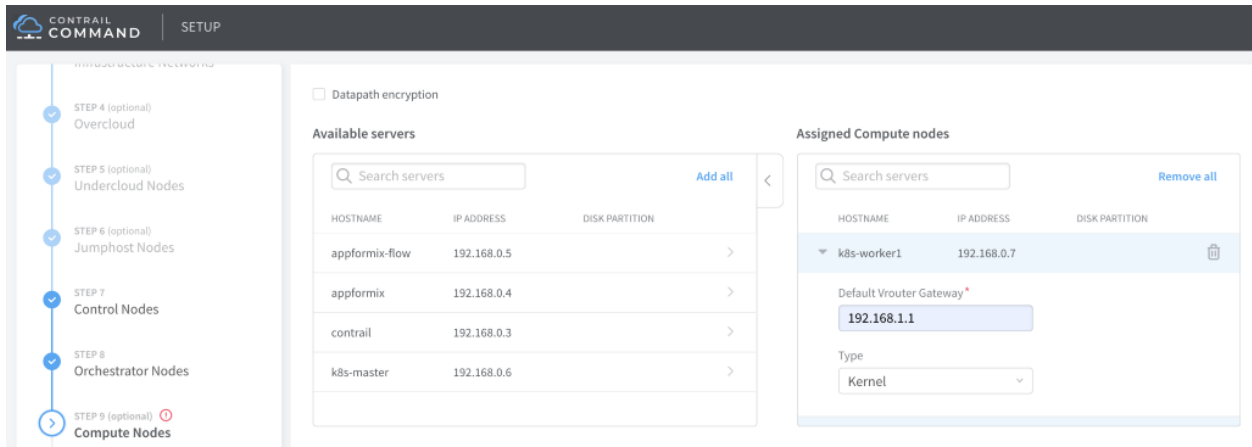
HOSTNAME	IP ADDRESS	DISK PARTITION
Roles*		
kubernetes_node ×		
k8s-worker2	192.168.0.8	>
Roles*		
kubernetes_node ×		

## Step2.6 Compute Node

VRouter をインストールするサーバを Assigned Compute Node に移行

※今回は K8s-worker に vRouter をインストールする

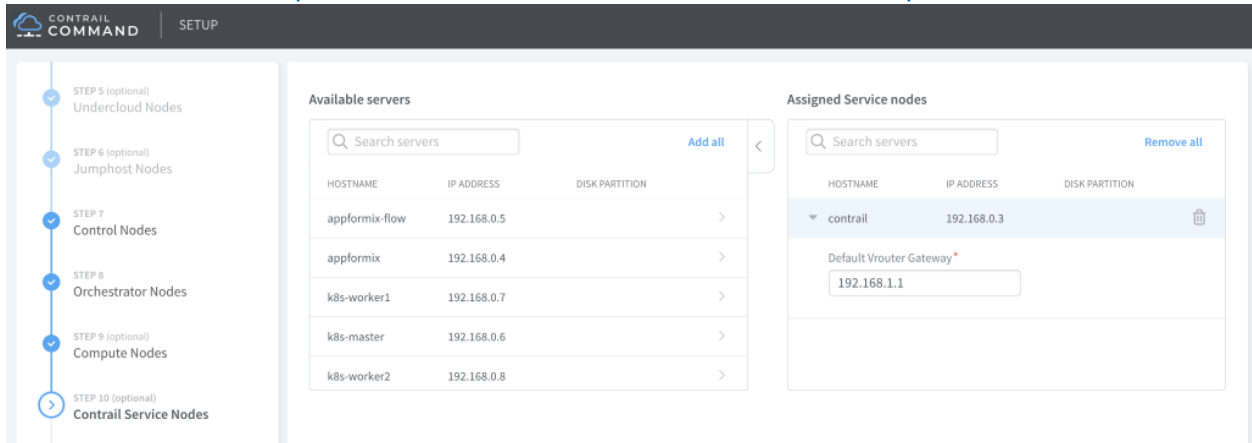
Default vRouter Gateway は vRouter の Default Gateway(xmpp 接続用の DataPlane 側)



## Step 2.7 Service Node

Contrail Service Node に設定するサーバを Assigned Service Node に移行

Default vRouter Gateway は Service Node の DataPlane 側 Default Gateway



## Step 2.8 Appformix Node

Appformix で監視対象のサーバを全て Assigned Appformix Node に移行

Appformix License は Contrail Command の /opt/software/appformix に入れた LicenseFile 名

Role のアサインは以下の通り

Appformix Controller : appformix\_platform\_node

その他全て : @appformix\_bare\_host\_node

CONTRAIL COMMAND | SETUP

STEP 5 (optional) Undercloud Nodes  
 STEP 6 (optional) Jumpost Nodes  
 STEP 7 Control Nodes  
 STEP 8 Orchestrator Nodes  
 STEP 9 (optional) Compute Nodes  
 STEP 10 (optional) Contrail Service Nodes  
 STEP 11 (optional) **AppFormix Nodes**  
 STEP 12 (optional) AppFormix Flows  
 STEP 13

AppFormix License\* ⓘ  
 appformix-internal-openstack-3.1.sig

AppFormix Configuration  
 + Add

Available servers

Search servers Add all

HOSTNAME	IP ADDRESS	DISK PARTITION
Add servers to your inventory		

Assigned AppFormix Nodes

Search servers Remove all

HOSTNAME	IP ADDRESS	DISK PARTITION
appformix	192.168.0.4	
Roles*		
appformix_platform_node x		
appformix-flow	192.168.0.5	
Roles*		

## Step2.9 Appformix Flow Node

**Option1:** Telemetry Interface に Out of Band(mgmt)を使用する場合  
 Virtual IP Address は未使用の IP を指定

CONTRAIL COMMAND | SETUP

STEP 5 (optional) Undercloud Nodes  
 STEP 6 (optional) Jumpost Nodes  
 STEP 7 Control Nodes  
 STEP 8 Orchestrator Nodes  
 STEP 9 (optional) Compute Nodes  
 STEP 10 (optional) Contrail Service Nodes  
 STEP 11 (optional) AppFormix Nodes  
 STEP 12 (optional) **AppFormix Flows**

Appformix Flows Node Provisioning Type  
 Out of Band  In-Band

Virtual IP Address\*  
 192.168.0.99

Show Advanced

Available servers

Search servers Add all

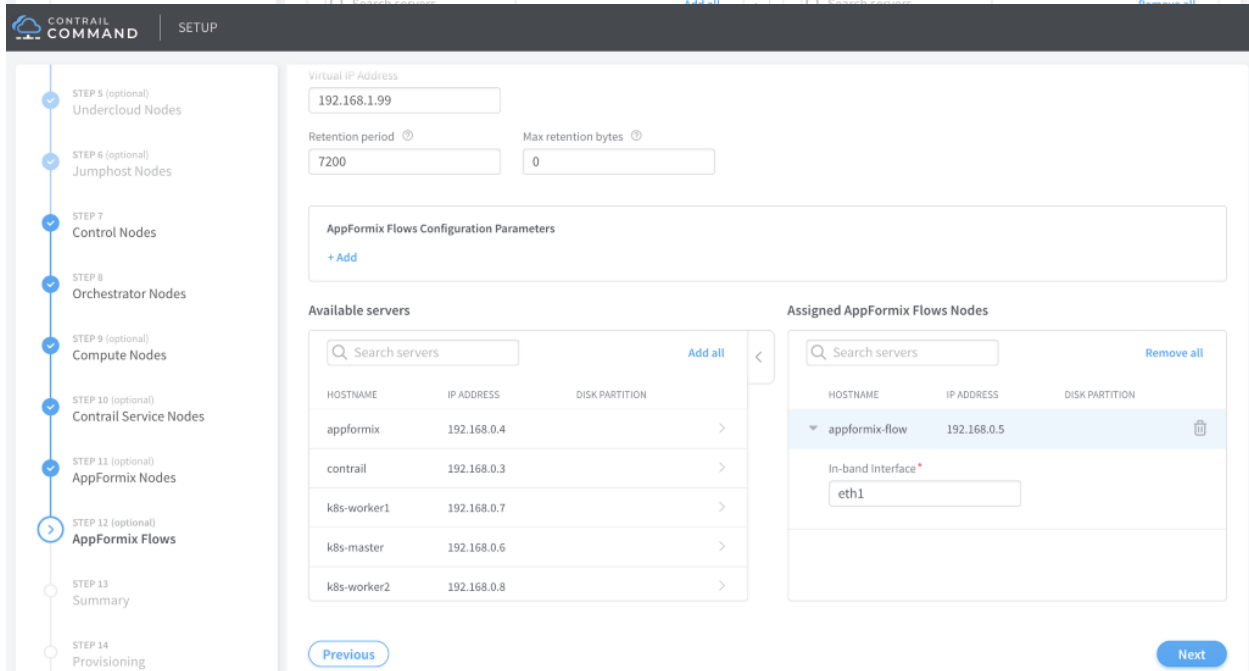
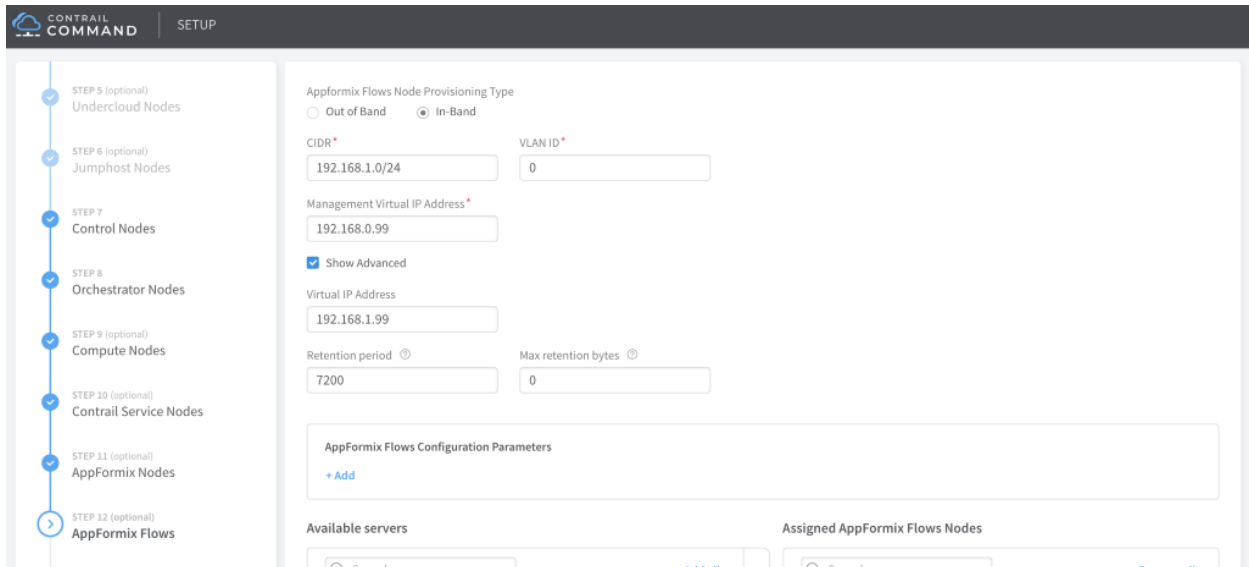
HOSTNAME	IP ADDRESS	DISK PARTITION
appformix	192.168.0.4	>
contrail	192.168.0.3	>
k8s-worker1	192.168.0.7	>
k8s-master	192.168.0.6	>
k8s-worker2	192.168.0.8	>

Assigned AppFormix Flows Nodes

Search servers Remove all

HOSTNAME	IP ADDRESS	DISK PARTITION
appformix-flow	192.168.0.5	

**Option2:** Telemetry Interface に In Band(DataNet)を使用する場合  
 Management Virtual IP Address は未使用の IP を指定  
 Virtual IP Address は未使用の IP を指定



## Step2.10 Provisioning

Provisioning をクリックし、Install 開始

CONTRAIL COMMAND SETUP

Encapsulation priority: VLAN, MPLS CORE, MPLS GUIP

Fabric Management: false

Contrail configuration: false

High availability mode: false

Manage vCenter: false

Orchestrator: **kubernetes**

AppFormix License: appformix-internal-openstack-3.1.sig

AppFormix Configuration: -

**Nodes overview**

All cluster nodes						
NAME	TYPE	IP ADDRESS	SERVER PROFILE	ROLES		
appformix	physical/virtual	192.168.0.4		AppFormix node		
appformix-flow	physical/virtual	192.168.0.5		AppFormix node; AppFormix Flow...		
contrail	physical/virtual	192.168.0.3		Control node; Service node; AppF...		
k8s-master	physical/virtual	192.168.0.6		Kubernetes node; AppFormix node		
k8s-worker1	physical/virtual	192.168.0.7		Compute node; Kubernetes node; ...		
k8s-worker2	physical/virtual	192.168.0.8		Compute node; Kubernetes node; ...		

Previous Provision

CONTRAIL COMMAND SETUP

STEP 5 (optional) Undercloud Nodes

STEP 6 (optional) Jumpost Nodes

STEP 7 Control Nodes

STEP 8 Orchestrator Nodes

STEP 9 (optional) Compute Nodes

STEP 10 (optional) Contrail Service Nodes

STEP 11 (optional) AppFormix Nodes

STEP 12 (optional) AppFormix Flows

STEP 13 Summary

STEP 14 **Provisioning**

**Provisioning cluster cluster1 in progress**

This might take a while, please wait...

You can check provisioning logs from contrail\_command container by

```
docker logs -f contrail_command
```

OR

```
docker exec contrail_command tail -f /var/log/contrail/deploy.log
```

Proceed to login

Contrail Command に SSH 接続し、以下のコマンドにてインストール状況の確認

```
docker exec contrail_command tail -f /var/log/contrail/deploy.log
```