



# Deploying and Configuring SMF through Ops Center

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## Feature Summary and Revision History

### Summary Data

*Table 1: Summary Data*

Applicable Product(s) or Functional Area	SMF
Applicable Platform(s)	SMI
Feature Default Setting	Disabled - Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

### Revision History

*Table 2: Revision History*

Revision Details	Release
First introduced.	Pre-2020.02.0

## Feature Description

The SMF deployment and configuration procedure involves deploying the SMF through the Subscriber Microservices Infrastructure (SMI) Cluster Deployer and configuring the settings or customizations through the SMF Operations (Ops) Center. The Ops Center is based on the ConfD CLI. The SMF configuration includes the NRF profile data configuration and the externally visible IP addresses and ports.

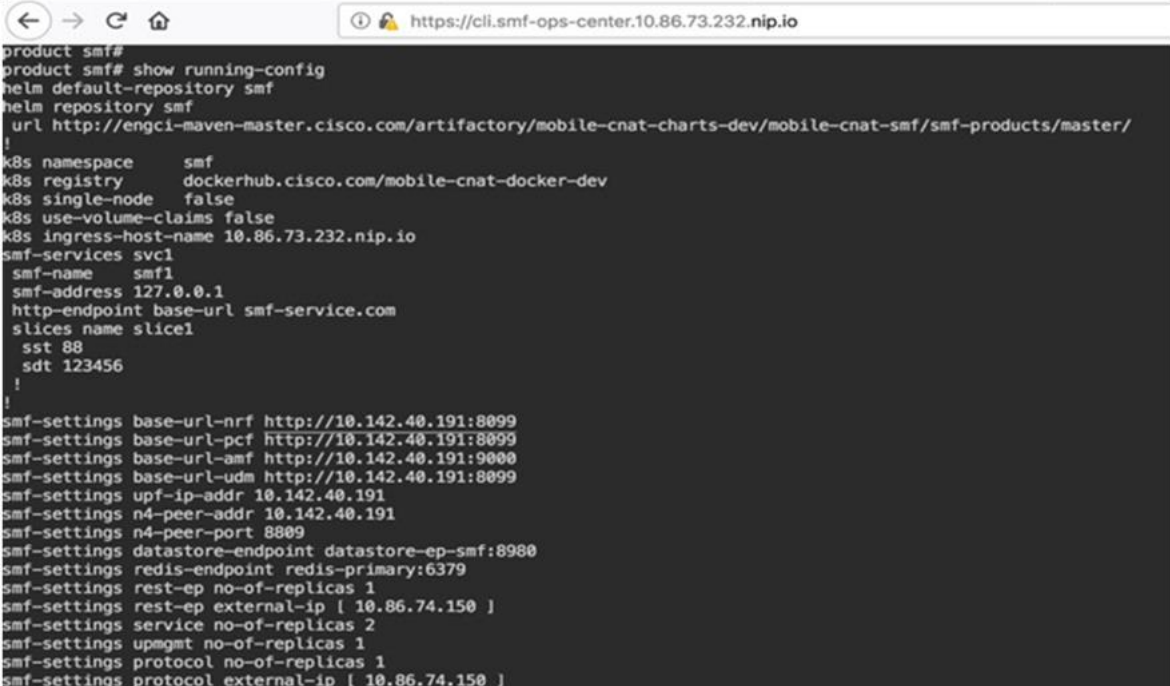
## SMF Ops Center

The Ops Center is a system-level infrastructure that provides the following functionality:

- A user interface to trigger a deployment of microservices with the flexibility of providing variable helm chart parameters to control the scale and properties of Kubernetes objects (deployment, pod, services, and so on) associated with the deployment.
- A user interface to push application-specific configuration to one or more microservices through Kubernetes configuration maps.
- A user interface to issue application-specific execution commands (such as show and clear commands). These commands:
  - Invoke some APIs in application-specific pods
  - Display the information returned on the user interface application

The following screenshot is a sample of the web-based command line interface presented to the user.

**Figure 1: Web-based CLI of Ops Center**



```

product smf#
product smf# show running-config
helm default-repository smf
helm repository smf
  url http://engci-maven-master.cisco.com/artifactory/mobile-cnaf-charts-dev/mobile-cnaf-smf/smf-products/master/
!
k8s namespace      smf
k8s registry        dockerhub.cisco.com/mobile-cnaf-docker-dev
k8s single-node     false
k8s use-volume-claims false
k8s ingress-host-name 10.86.73.232.nip.io
smf-services svc1
  smf-name          smf1
  smf-address       127.0.0.1
  http-endpoint base-url smf-service.com
  slices name slice1
  sst 88
  sdt 123456
!
smf-settings base-url-nrf http://10.142.40.191:8099
smf-settings base-url-pcf http://10.142.40.191:8099
smf-settings base-url-amf http://10.142.40.191:9000
smf-settings base-url-udm http://10.142.40.191:8099
smf-settings upf-ip-addr 10.142.40.191
smf-settings n4-peer-addr 10.142.40.191
smf-settings n4-peer-port 8809
smf-settings datastore-endpoint datastore-ep-smf:8980
smf-settings redis-endpoint redis-primary:6379
smf-settings rest-ep no-of-replicas 1
smf-settings rest-ep external-ip [ 10.86.74.150 ]
smf-settings service no-of-replicas 2
smf-settings upmgmt no-of-replicas 1
smf-settings protocol no-of-replicas 1
smf-settings protocol external-ip [ 10.86.74.150 ]

```

The SMF Ops Center allows you to configure the features such as licensing, SMF engine, REST Endpoint, and CDL.

## Prerequisites

Before deploying SMF on the SMI layer:

- Ensure that all the virtual network functions (VNFs) are deployed.
- Run the SMI synchronization operation for the SMF Ops Center and Cloud Native Common Execution Environment (CN-CEE)

# Deploying and Accessing SMF

This section describes how to deploy SMF and access the SMF Ops Center.

## Deploying SMF

The SMI platform is responsible for deploying and managing the Cloud Native 5G SMF application and other network functions.

For deploying SMF Ops Center on a vCenter environment, see *Deploying and Upgrading the Product* section in the *UCC SMI Cluster Deployer Operations Guide*.

For deploying SMF Ops Center on a OpenStack environment, see *UAME-based VNF Deployment* section in the *UAME-based 4G and 5G VNF Deployment Automation Guide, Release 6.9*

## Accessing the SMF Ops Center

You can connect to the SMF Ops Center through SSH or the web-based CLI console.

- SSH:

```
ssh admin@ops_center_pod_ip -p 2024
```

- Web-based console:

1. Log in to the Kubernetes master node.

2. Run the following command:

```
kubectl get ingress <namespace>
```

The available ingress connections get listed.

3. Select the appropriate ingress and access the SMF Ops Center.

4. Access the following URL from your web browser:

```
cli.<namespace>-ops-center.<ip_address>.nip.io
```

By default, the Day 0 configuration is loaded into the SMF.

## Day 0 Configuration

To view the Day 0 configuration, run the following command.

### **show running-config**

The following is a sample Day 0 configuration:

```

root@smf-cluster# ssh -p 2024 admin@$(kubect1 get svc -n smf-smf --no-headers | grep
smf-ops-center| grep 2024 |awk '{print $3}')
admin@1.1.1.1's password:
Welcome to the CLI
admin connected from 2.2.2.2 using ssh on ops-center-smf-smf-ops-center-76bbc7f4df-rkrff
product smf# show running-config
helm default-repository base-repos
helm repository base-repos
url
https://engci-maven-master.cisco.com/artifactory/smi-fuse-internal-snapshot/mobile-cnat-smf/smf-products/master/
exit
k8s namespace smf-smf
k8s registry dockerhub.cisco.com/smi-fuse-docker-internal
k8s single-node false
k8s use-volume-claims false
k8s ingress-host-name 1.1.1.2.nip.io
aaa authentication users user admin
uid 117
gid 117
password $1$fvlWGa/b$GW6OyeqG77lQ.Xu/qcbgu.
ssh_keydir /tmp/admin/.ssh
homedir /tmp/admin
exit
aaa ios level 0
prompt "\h> "
exit
aaa ios level 15
prompt "\h# "
exit
aaa ios privilege exec
level 0
command action
exit
command autowizard
exit
command enable
exit
command exit
exit
command help
exit
command startup
exit
exit
level 15
command configure
exit
exit
exit
nacm write-default deny
nacm groups group LI
user-name [ liadmin ]
exit
nacm groups group admin
user-name [ admin ]
exit

```

```
nacm rule-list admin
group [ admin ]
rule li-deny-tap
  module-name      lawful-intercept
  path             /lawful-intercept
  access-operations *
  action           deny
exit
rule li-deny-clear
  module-name      tailf-mobile-smf
  path             /clear/lawful-intercept
  access-operations *
  action           deny
exit
rule any-access
  action permit
exit
exit
nacm rule-list confd-api-manager
group [ confd-api-manager ]
rule any-access
  action permit
exit
exit
nacm rule-list lawful-intercept
group [ LI ]
rule li-accept-tap
  module-name      lawful-intercept
  path             /lawful-intercept
  access-operations *
  action           permit
exit
rule li-accept-clear
  module-name      tailf-mobile-smf
  path             /clear/lawful-intercept
  access-operations *
  action           permit
exit
exit
nacm rule-list any-group
group [ * ]
rule li-deny-tap
  module-name      lawful-intercept
  path             /lawful-intercept
  access-operations *
  action           deny
exit
rule li-deny-clear
  module-name      tailf-mobile-smf
  path             /clear/lawful-intercept
  access-operations *
  action           deny
exit
exit
```

## SMF Service Configuration

The SMF service requires the basic configuration to process PDU Session Management API calls.

## Configuring SMF

The SMF configuration is provided using the Ops Center infrastructure.

The following is a sample SMF configuration:

```
smf-settings base-url-nrf http://10.81.71.223:8082/NRF
smf-settings base-url-amf http://10.81.71.223:8090
smf-settings base-url-udm http://10.81.71.224:8099
smf-settings upf-ip-addr 10.81.71.224
smf-settings n4-peer-addr 10.81.71.224
smf-settings n4-peer-port 8809
smf-settings datastore-endpoint datastore-ep-smf:8980
smf-settings redis-endpoint redis-primary:6379
smf-settings rest-ep no-of-replicas 1
smf-settings rest-ep external-ip [ 10.81.71.224 ]
smf-settings service no-of-replicas 1
smf-settings upgmt no-of-replicas 1
smf-settings protocol no-of-replicas 1
smf-settings protocol external-ip [ 10.81.71.228 ]
```

The following table describes the supported SMF commands:

**Table 3: Supported SMF Commands**

No.	Configuration	Description
1	<b>smf-services</b> <i>service_name</i>	Configures a new SMF service. Entering this command results in a sub command mode. <i>service_name</i> is the name of the SMF service.
2	<b>smf-name</b> <i>node_name</i>	Specifies the NF name that is sent to the NRF during the SMF registration. This is a command in the smf-services mode.
3	<b>http-endpoint base-url</b> <i>url</i>	Configures the base endpoint URL to be sent in the NRF registration of the SMF. This is a command in the smf-services mode.
4	<b>dnn</b> <i>dnn_name</i>	Specifies the SMF-served DNN name. This is sent to the NRF during the SMF registration. This is a command in the smf-services mode.
5	<b>slices name</b> <i>slice_name sdt sdt_value sst sst_value</i>	Specifies the slice information to which the SMF belongs. This includes the slice type (sst) and slice descriptor (sdt). This is sent to the NRF during the SMF registration. This is a command in the smf-services mode.

No.	Configuration	Description
6	<b>smf-settings base-url-nrf</b> <i>nrf_url</i> <b>smf-settings base-url-amf</b> <i>amf_url</i> <b>smf-settings base-url-pcf</b> <i>pcf_url</i> <b>smf-settings base-url-udm</b> <i>udm_url</i> <b>smf-settings rest-ep no-of-replicas</b> <i>num_replicas</i>	Specifies the URL for the SBI interface towards the NRF, UDM, AMF, and PCF. These configurations are used when the nodes are not discovered through the NRF discovery procedure.  Specifies the number of replicas for the different microservices of the SMF.
7	<b>smf-settings upf-ip-addr</b> <i>upf_ip_address</i> <b>smf-settings n4-peer-addr</b> <i>upf_ip_address</i> <b>smf-settings n4-peer-port</b> <i>upf_port</i>	Specifies the peer UPF IP address and port configuration.
8	<b>smf-settings n4-addr</b> <i>pfcp_intf_address</i>	Specifies the N4 interface IP address of the SMF towards the peer UPF.
9	<b>smf-settings datastore-endpoint</b> <i>datastore_endpoint</i> <b>smf-settings redis-endpoint</b> <i>redis_store_endpoint</i>	Specifies the endpoints for the mongodb and redis data stores.
10	<b>smf-settings rest-ep no-of-replicas</b> <i>num_replicas</i> <b>smf-settings service no-of-replicas</b> <i>num_replicas</i> <b>smf-settings upmgmt no-of-replicas</b> <i>num_replicas</i> <b>smf-settings protocol no-of-replicas</b> <i>num_replicas</i>	Specifies the number of replicas for the different microservices of the SMF.
11	<b>smf-settings rest-ep external-ip</b> [ <i>restep_external_ip</i> ] <b>smf-settings protocol external-ip</b> [ <i>smfprot_external_IP</i> ]	Specifies the service IP to be exposed for the rest-ep and smf-protocol services.
12	<b>ue-pool</b> <i>ipv4_address</i>	Specifies the IP pool to assign the IPv4 address in the CIDR notation to the UE session.

Contact your Cisco Account representative for the corresponding yang and render.yaml files.

## Loading Day 1 Configuration

To load the Day 1 configuration for SMF, run the following command:

```
ssh admin@ops_center_pod_ip -p 2024 < Day1config.cli
```



**Note** The [Day1config.cli](#) file contains the necessary parameters required for the Day 1 configuration.

Alternatively, you can copy the configuration and paste it in the SMF Ops Center CLI to load the Day 1 configuration.

**configure**

&lt;Paste the Day 1 configuration here&gt;

**commit****exit**

A sample *Day1config.cli* file, which contains the Day 1 configuration for SMF is shown below.

## Day1config.cli

The following is a sample *Day1config.cli* file, which contains the Day 1 configuration for the SMF.

```

config
ipam
  source local
  address-pool ipv6
    vrf-name ISP
    tags
      dnn intershat
    exit
  ipv6
    prefix-ranges
      prefix-range 2001:4870:e00b:1500:: length 56
    exit
  exit
exit
address-pool poolv4
  vrf-name ISP
  tags
    dnn intershat
  exit
  ipv4
    split-size
      per-cache 1024
      per-dp 256
    exit
    address-range 0.0.0.1 0.0.0.254
  exit
exit
exit
group nf-mgmt NFMGMT1
  nrf-mgmt-group MGMT
  locality LOC1
exit
group nrf discovery udmdiscovery
  service type nrf nnrf-disc
  endpoint-profile epprof
    capacity 10
    priority 1
    uri-scheme http
    version
      uri-version v1
      full-version 1.1.1.[1]
    exit
  exit
  endpoint-name endpointName
    priority 1
    capacity 100
    primary ip-address ipv4 3.3.3.3
    primary ip-address port 8082
  exit
exit
exit

```



```
exit
group nrf mgmt MGMT
  service type nrf nnrf-nfm
  endpoint-profile mgmt-1
  priority 1
  uri-scheme http
  endpoint-name mgmt-1
  primary ip-address ipv4 3.3.3.3
  primary ip-address port 8082
  secondary ip-address ipv4 3.3.3.3
  secondary ip-address port 8083
  tertiary ip-address ipv4 3.3.3.3
  tertiary ip-address port 8084
  exit
exit
exit
cdl node-type smf-cdl
cdl zookeeper replica 2
cdl kafka replica 2
etcd replicas 1
endpoint nodemgr
exit
endpoint gtp
  replicas 1
  vip-ip 4.4.4.4
exit
endpoint pfcp
  replicas 1
  nodes 2
exit
endpoint service
  replicas 1
  nodes 1
exit
endpoint protocol
  replicas 1
  nodes 2
  vip-ip 4.4.4.4
exit
endpoint sbi
  replicas 1
  nodes 2
  vip-ip 4.4.4.4
  interface nrf
    loopbackPort 7005
    vip-ip 20.20.20.5 vip-port 9005
  exit
  interface n7
    loopbackPort 7001
    vip-ip 20.20.20.1 vip-port 9001
  exit
  interface n10
    loopbackPort 7004
    vip-ip 20.20.20.4 vip-port 9004
  exit
  interface n40
    loopbackPort 7003
    vip-ip 20.20.20.3 vip-port 9003
  exit
exit
logging level application trace
logging level transaction trace
logging level tracing off
```

```

logging name infra.config.core level application debug
logging name infra.config.core level transaction warn
logging name infra.config.core level tracing warn
logging name infra.resource_monitor.core level application warn
logging name infra.resource_monitor.core level transaction warn
deployment
  app-name      SMF
  cluster-name  Local
  dc-name       DC
  model         small
exit
k8 label protocol-layer key smi.cisco.com/node-type value smf-proto
exit
k8 label service-layer key vm-type value smf-svc
exit
k8 label cdl-layer key smi.cisco.com/node-type value smf-cdl
exit
k8 label oam-layer key smi.cisco.com/node-type value oam
exit
helm default-repository smf
helm repository smf
  url
  https://engci-maven-master.cisco.com/artifactory/smi-fuse-internal-snapshot/mobile-cnaf-smf/smf-products/master/
exit
helm repository smf-stage
  url
  https://engci-maven-master.cisco.com/artifactory/smi-fuse-internal-snapshot/mobile-cnaf-smf/smf-products/dev-smf-stage/
exit
k8s namespace      smf
k8s registry        dockerhub.cisco.com/smi-fuse-docker-internal
k8s single-node     false
k8s use-volume-claims false
k8s ingress-host-name 1.1.1.1.nip.io
profile dnn intershat
  dns primary ipv4 11.11.1.1
  dns primary ipv6 66:66:1::aa
  dns secondary ipv4 22.22.2.2
  dns secondary ipv6 66:66:2::bb
  network-element-profiles chf chf1
  network-element-profiles amf amf1
  network-element-profiles pcf pcf1
  network-element-profiles udm udm1
  dnn starent.com network-function-list [ upf ]
  charging-profile chgprfl
  virtual-mac      b6:6d:47:47:47:47
  pcscf-profile    pcscf1
  ssc-mode 1
  session type IPV4 allowed [ IPV4V6 ]
  upf apn cisco.com
exit
profile dnn profDnn1
  dnn cisco.com network-function-list [ chf pcf udm upf ]
  charging-profile chgprfl
  ssc-mode 1
  session type IPV4
exit
profile dnn profDnn2
  dnn cisco.com network-function-list [ chf pcf rmgr udm upf ]
  charging-profile chgprfl
  ssc-mode 1
  session type IPV4
exit
profile charging chgprfl
  method [ offline ]

```

```
limit volume 20
limit duration 60
tight-interworking-mode true
reporting-level online rating-group
reporting-level offline service-id
exit
profile pcscf pcscf1
v4-list
precedence 3
  primary 3.3.3.1
  secondary 3.3.3.2
exit
precedence 5
  primary 5.5.5.1
  secondary 5.5.5.2
exit
precedence 7
  primary 7.7.7.1
  secondary 7.7.7.2
exit
exit
v6-list
precedence 3
  primary 33:33::1
  secondary 33:33::2
exit
precedence 5
  primary 55:55::1
  secondary 55:55::2
exit
exit
v4v6-list
precedence 3
  primary ipv4 46.46.33.1
  primary ipv6 46:46:33::1
  secondary ipv4 46.46.33.2
  secondary ipv6 46:46:33::2
exit
precedence 5
  primary ipv4 46.46.55.1
  primary ipv6 46:46:55::1
  secondary ipv4 46.46.55.2
  secondary ipv6 46:46:55::2
exit
precedence 7
  primary ipv4 46.46.77.1
  primary ipv6 46:46:77::1
  secondary ipv4 46.46.77.2
  secondary ipv6 46:46:77::2
exit
exit
exit
profile charging-characteristics 1
  charging-profile chgprf1
exit
profile icmpv6 icmpprf1
  options virtual-mac b6:6d:57:45:45:45
exit
profile smf smf1
  locality LOC1
  bind-address ipv4 4.4.4.4
  bind-port 8090
  fqdn 5.5.5.5
  allowed-nssai [ slice1 slice2 ]
```

```

plmn-id mcc 123
plmn-id mnc 456
service name nsmf-pdu
  type pdu-session
  schema http
  version 1.Rn.0.0
  http-endpoint base-url http://smf-service
  icmpv6-profile icmprfl
  compliance-profile dec18
  access-profile access1
  policy subscriber polSub
exit
exit
profile compliance dec18
  service nsmf-pdusection
  version uri v1
  version full 1.0.0
  version spec 15.2.0
exit
  service namf-comm
  version uri v1
  version full 1.0.0
  version spec 15.2.0
exit
  service n1
  version uri v1
  version full 1.0.0
  version spec 15.2.0
exit
  service n2
  version uri v1
  version full 1.0.0
  version spec 15.2.0
exit
  service nudm-sdm
  version uri v1
  version full 1.0.0
  version spec 15.2.1
exit
  service nudm-uecm
  version uri v1
  version full 1.0.0
  version spec 15.2.1
exit
  service nnrf-disc
  version uri v1
  version full 1.0.0
  version spec 15.2.0
exit
  service nnrf-nfm
  version uri v1
  version full 1.0.0
  version spec 15.2.0
exit
  service npcfsmpolicycontrol
  version uri v1
  version full 1.0.0
  version spec 15.2.0
exit
  service nchf-convergedcharging
  version uri v2
  version full 1.0.0
  version spec 15.2.1
exit

```

```

exit
profile network-element amf amf1
  nf-client-profile      amfP1
  failure-handling-profile FH3
  query-params [ dnn ]
exit
profile network-element pcf pcf1
  nf-client-profile      pcfP1
  failure-handling-profile FH1
  rulebase-prefix       cbn#
  predefined-rule-prefix crn#
exit
profile network-element udm udm1
  nf-client-profile      udmP1
  failure-handling-profile FH1
exit
profile network-element upf upf1
  n4-peer-address ipv4 6.6.6.6
  n4-peer-port 8805
  keepalive 60
  dnn-list [ dnn1 intershat starent ]
exit
profile network-element chf chf1
  nf-client-profile      chfP1
  failure-handling-profile FH2
  nf-client-profile-offline CP2
  failure-handling-profile-offline FH2
exit
profile qos abc
  ambr ul "250 Kbps"
  ambr dl "500 Kbps"
  qi5 7
  arp priority-level 14
  arp preempt-cap NOT_PREEMPT
  arp preempt-vuln PREEMPTABLE
  priority 120
  max data-burst 2000
  dscp-map qi5 2 arp-priority-level 3 uplink user-datagram dscp-marking 0x1c
  dscp-map qi5 2 arp-priority-level 3 downlink user-datagram dscp-marking 0x1a encsp-header
  dscp-marking 0x1b
  dscp-map qi5 3 arp-priority-level 3 uplink user-datagram dscp-marking 0x4
  dscp-map qi5 3 arp-priority-level 3 downlink user-datagram dscp-marking 0x3 encsp-header
  copy-inner
exit
profile access access1
  eps-fallback cbr delay 500 max-retry 10 timeout 3
  n26 idft enable timeout 15
  n2 idft enable timeout 15
exit
profile nf-client nf-type udm
  udm-profile udmP1
  locality LOC1
  priority 30
  service name type nudm-sdm
  endpoint-profile EP1
  capacity 30
  uri-scheme http
  endpoint-name EP1
  primary ip-address ipv4 3.3.3.3
  primary ip-address port 9007
  exit
  exit
  exit
  service name type nudm-uecm

```

```
    endpoint-profile EP1
      capacity 30
      uri-scheme http
      endpoint-name EP1
        primary ip-address ipv4 3.3.3.3
        primary ip-address port 9001
      exit
    exit
  exit
exit
profile nf-client nf-type pcf
pcf-profile pcfP1
locality LOC1
priority 30
service name type npc-f-am-policy-control
  endpoint-profile EP1
    capacity 30
    uri-scheme http
    endpoint-name EP1
      priority 50
      primary ip-address ipv4 3.3.3.3
      primary ip-address port 9003
    exit
  exit
exit
service name type npc-f-smpolicycontrol
  endpoint-profile EP1
    capacity 30
    uri-scheme http
    endpoint-name EP1
      priority 5
      primary ip-address ipv4 3.3.3.3
      primary ip-address port 9003
    exit
  endpoint-name realPCF
    priority 10
    primary ip-address ipv4 7.7.7.7
    primary ip-address port 9082
  exit
exit
exit
exit
exit
profile nf-client nf-type amf
amf-profile amfP1
locality LOC1
priority 10
service name type namf-comm
  endpoint-profile EP1
    capacity 20
    uri-scheme http
    endpoint-name EP1
      priority 30
      primary ip-address ipv4 3.3.3.3
      primary ip-address port 9002
    exit
  exit
exit
exit
exit
exit
```

```
profile nf-client nf-type chf
chf-profile CP2
locality LOC1
priority 31
service name type nchf-convergedcharging
endpoint-profile EP1
capacity 30
uri-scheme http
version
uri-version v2
exit
exit
endpoint-name EP1
priority 56
primary ip-address ipv4 3.3.3.3
primary ip-address port 9906
exit
exit
exit
exit
chf-profile chfP1
locality LOC1
priority 10
service name type nchf-convergedcharging
endpoint-profile EP1
capacity 30
uri-scheme http
version
uri-version v2
exit
exit
endpoint-name EP1
priority 50
primary ip-address ipv4 3.3.3.3
primary ip-address port 9904
exit
endpoint-name EP2
priority 80
primary ip-address ipv4 3.3.3.3
primary ip-address port 9905
exit
exit
exit
exit
exit
profile nf-pair nf-type UDM
locality client LOC1
locality geo-server GEO
exit
profile nf-pair nf-type AMF
locality client LOC1
locality geo-server GEO
exit
profile nf-pair nf-type PCF
locality client LOC1
locality geo-server GEO
exit
profile nf-pair nf-type UPF
nrf-discovery-group udmdiscovery
locality client LOC1
locality preferred-server LOC1
locality geo-server GEO
```

```
exit
profile nf-pair nf-type CHF
  locality client LOC1
  locality preferred-server LOC1
  locality geo-server GEO
exit
profile nf-client-failure nf-type chf
  profile failure-handling FH2
  service name type nchf-convergedcharging
  message type ChfConvergedchargingCreate
    status-code httpv2 0
    action continue
  exit
  exit
  message type ChfConvergedchargingUpdate
    status-code httpv2 0
    action continue
  exit
  exit
  exit
  exit
  exit
  exit
  exit
  policy subscriber polSub
  precedence 1
  sst 01
  sdt ABcd01
  serving-plmn mcc 123
  serving-plmn mnc 456
  supi-start-range 1000000000000001
  supi-stop-range 9999999999999999
  gpsi-start-range 1000000000
  gpsi-stop-range 9999999999
  operator-policy opPol1
  exit
  exit
  policy operator opPol1
  policy dnn opPolDnn1
  exit
  policy dnn dnnPol1
  profile default
  dnn starent profile abc.com
  exit
  policy dnn opPolDnn1
  dnn intershat profile intershat
  dnn intershat1 profile profDnn1
  exit
  policy dnn polDnn
  profile default
  dnn intershat profile intershat
  dnn intershat1 profile profDnn1
  dnn intershat2 profile profDnn2
  exit
  nssai name slice1
  sst 01
  sdt ABcd01
  dnn [ intershat ]
  exit
  nssai name slice2
  sst 02
  sdt 000003
  dnn [ cisco.com ]
  exit
  active-charging service acs1
  packet-filter pkt1
```



```

ip local-port range 2 to 23
ip protocol = 23
ip remote-address = 10.10.10.0/24
ip remote-port range 12 to 34
ip tos-traffic-class = 23 mask = 23
priority 23
exit
packet-filter pkt2
direction uplink
ip local-port = 100
ip protocol = 100
ip remote-address = 1.1.1.1/32
ip remote-port = 140
priority 100
exit
packet-filter pkt3
direction downlink
ip local-port = 111
ip protocol = 111
ip remote-address = 2.2.2.2/31
ip remote-port = 111
priority 111
exit
charging-action ca1
allocation-retention-priority 12 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard committedDataRate 2000000 committed-burst-size 100 exceed-action
discard
flow limit-for-bandwidth direction downlink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
qos-class-identifier 3
tft-notify-ue
tos af11
tft packet-filter pkt1
exit
charging-action ca10
flow limit-for-bandwidth direction uplink peak-data-rate 2000000000 peak-burst-size 100
violate-action discard
flow limit-for-bandwidth direction downlink peak-data-rate 3000000000 peak-burst-size 100
violate-action discard
tos af11
exit
charging-action ca11
flow limit-for-bandwidth direction uplink peak-data-rate 2000000000 peak-burst-size 100
violate-action discard
flow limit-for-bandwidth direction downlink peak-data-rate 3000000000 peak-burst-size 100
violate-action discard
exit
charging-action ca12
flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard
flow limit-for-bandwidth direction downlink peak-data-rate 3000000 peak-burst-size 100
violate-action discard
exit
charging-action ca13
flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard
flow limit-for-bandwidth direction downlink peak-data-rate 3000000 peak-burst-size 100
violate-action discard
exit
charging-action ca2
allocation-retention-priority 13 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
flow limit-for-bandwidth direction uplink peak-data-rate 2000000000 peak-burst-size 100

```

```

violate-action discard committedDataRate 3000000000 committed-burst-size 100 exceed-action
discard
  flow limit-for-bandwidth direction downlink peak-data-rate 3000000000 peak-burst-size 100
violate-action discard committedDataRate 4000000000 committed-burst-size 100 exceed-action
discard
  qos-class-identifier 2
  tft-notify-ue
  tos af11
  tft packet-filter pkt2
exit
charging-action ca20
  flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
  flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca21
  flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
  flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca22
  flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
  flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca23
  flow limit-for-bandwidth direction uplink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
  flow limit-for-bandwidth direction downlink peak-data-rate 1000000 peak-burst-size 100
violate-action discard
exit
charging-action ca3
  allocation-retention-priority 14 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
  flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 1000000 committed-burst-size 100 exceed-action
discard
  flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
  qos-class-identifier 1
  tft-notify-ue
  tos af11
  tft packet-filter pkt3
exit
charging-action ca4
  allocation-retention-priority 11 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
  flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
  flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
violate-action discard committedDataRate 4000000 committed-burst-size 100 exceed-action
discard
  qos-class-identifier 4
  tft-notify-ue
  tos af11
  tft packet-filter pkt1
exit
charging-action ca5
  allocation-retention-priority 11 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
  flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action

```

```
discard
  flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
  violate-action discard committedDataRate 4000000 committed-burst-size 100 exceed-action
discard
  qos-class-identifier 4
  tft-notify-ue
  tos af11
  tft packet-filter pkt2
exit
charging-action ca6
  allocation-retention-priority 11 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
  flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
  violate-action discard committedDataRate 3000000 committed-burst-size 100 exceed-action
discard
  flow limit-for-bandwidth direction downlink peak-data-rate 4000000 peak-burst-size 100
  violate-action discard committedDataRate 4000000 committed-burst-size 100 exceed-action
discard
  qos-class-identifier 4
  tft-notify-ue
  tos af11
  tft packet-filter pkt3
exit
charging-action ca7
  allocation-retention-priority 1 pci NOT_PREEMPT pvi NOT_PREEMPTABLE
  flow limit-for-bandwidth direction uplink peak-data-rate 2000000 peak-burst-size 100
  violate-action discard
  flow limit-for-bandwidth direction downlink peak-data-rate 400000 peak-burst-size 100
  violate-action discard
  qos-class-identifier 7
  tft-notify-ue
  tos af11
exit
charging-action caGyGz
  billing-action egcdr
  cca charging credit rating-group 102
  content-id 102
  service-identifier 202
exit
charging-action caOffline
  billing-action egcdr
  content-id 100
  service-identifier 200
exit
charging-action caOffline1
  billing-action egcdr
  content-id 11
  service-identifier 21
exit
charging-action caOffline2
  billing-action egcdr
  content-id 12
  service-identifier 22
exit
charging-action caOffline3
  billing-action egcdr
  content-id 13
  service-identifier 23
exit
charging-action caOffline4
  billing-action egcdr
  content-id 40
exit
charging-action caOfflineOnline
  billing-action egcdr
```

```

cca charging credit
content-id 30
service-identifier 60
exit
charging-action caOfflineOnline1
billing-action egcdr
cca charging credit
content-id 31
service-identifier 61
exit
charging-action caOnline
cca charging credit rating-group 100
content-id 100
service-identifier 200
exit
charging-action caOnline1
cca charging credit rating-group 101
content-id 101
service-identifier 201
exit
charging-action caOnline2
cca charging credit
content-id 102
service-identifier 202
exit
charging-action caOnline3
cca charging credit
content-id 103
service-identifier 203
exit
charging-action caOnline4
cca charging credit
content-id 110
exit
charging-action nocharging
exit
rulebase cbn#spp-1
action priority 1 ruledef crn#test_1 charging-action ca1
action priority 2 ruledef crn#test_2 charging-action ca2
exit
rulebase rba1
action priority 1 dynamic-only ruledef rda1 charging-action ca1 description myrule1
action priority 2 dynamic-only ruledef rda2 charging-action ca2 description myrule2
action priority 3 dynamic-only ruledef rda3 charging-action ca3 description myrule3
exit
rulebase rba2
action priority 10 ruledef rda10 charging-action ca10 description myrule10
action priority 11 ruledef rda11 charging-action ca11 description myrule11
action priority 12 dynamic-only ruledef rda12 charging-action ca12 description myrule12
action priority 13 dynamic-only ruledef rda13 charging-action ca13 description myrule13
exit
rulebase rba3
action priority 20 ruledef rda20 charging-action ca20 description myrule20
action priority 21 ruledef rda21 charging-action ca21 description myrule21
action priority 22 dynamic-only ruledef rda22 charging-action ca22 description myrule22
action priority 23 dynamic-only ruledef rda23 charging-action ca23 description myrule23
exit
rulebase rba4
action priority 30 ruledef rda3 charging-action ca3 description myrule3
action priority 31 dynamic-only ruledef rda3 charging-action ca3 description myrule3
exit
rulebase rba5
action priority 50 dynamic-only ruledef rda50 charging-action ca4 description myrule50
action priority 51 dynamic-only ruledef rda51 charging-action ca5 description myrule51

```

```

    action priority 52 dynamic-only ruledef rda52 charging-action ca6 description myrule52
exit
rulebase rba6
    action priority 60 dynamic-only ruledef rda60 charging-action ca1 description myrule60
    action priority 61 dynamic-only ruledef rda61 charging-action ca1 description myrule61
    action priority 62 dynamic-only ruledef rda62 charging-action ca1 description myrule62
exit
rulebase rba7
    action priority 50 ruledef rda50 charging-action ca4 description myrule50
    action priority 51 ruledef rda51 charging-action ca5 description myrule51
    action priority 52 ruledef rda52 charging-action ca6 description myrule52
exit
rulebase rba8
    action priority 60 ruledef rda60 charging-action ca1 description myrule60
    action priority 61 ruledef rda61 charging-action ca1 description myrule61
    action priority 62 ruledef rda62 charging-action ca1 description myrule62
exit
rulebase rbaStatic
    action priority 10 ruledef rda20 charging-action caOffline
exit
rulebase rbaStatic-Online
    action priority 20 ruledef rdaStatic charging-action caOnline
exit
rulebase rbaStatic1
    action priority 10 ruledef rda20 charging-action caOffline
exit
rulebase rba_GyGz
    egcdr threshold volume downlink 100000 uplink 100000
    action priority 20 dynamic-only ruledef rdaPredefined charging-action caGyGz
    action priority 30 ruledef rda20 charging-action caGyGz
exit
rulebase rba_charging_StaticDynamic_Offline_Online_mix
    cca diameter requested-service-unit sub-avp volume cc-input-octets 11000 cc-output-octets
12000 cc-total-octets 23000
    credit-control-group onlineoffline
    egcdr threshold interval 100
    egcdr threshold volume downlink 150000 uplink 150000 total 300000
    action priority 20 dynamic-only ruledef rdaPredefined charging-action caOffline1
    action priority 21 dynamic-only ruledef rdaPredefined1 charging-action caOnline1
    action priority 31 ruledef rdaStatic charging-action caOfflineOnline
exit
rulebase rba_charging_StaticDynamic_offline
    egcdr threshold volume downlink 100000 uplink 100000
    action priority 20 dynamic-only ruledef rdaPredefined charging-action caOffline1
    action priority 30 ruledef rda20 charging-action caOffline
exit
rulebase rba_charging_StaticDynamic_online
    action priority 20 ruledef rda20 charging-action caOnline
    action priority 30 dynamic-only ruledef rdaPredefined charging-action caOnline1
exit
rulebase rbs1
    action priority 1 ruledef rds1 charging-action ca1 description myrules1
    action priority 2 ruledef rds2 charging-action ca2 description myrules2
exit
urr-list urr_smf
    rating-group 10 service-identifier 20 urr-id 1
    rating-group 11 service-identifier 21 urr-id 2
    rating-group 12 service-identifier 22 urr-id 3
    rating-group 13 service-identifier 23 urr-id 4
    rating-group 30 service-identifier 60 urr-id 20
    rating-group 31 service-identifier 61 urr-id 21
    rating-group 100 service-identifier 200 urr-id 5
    rating-group 101 service-identifier 201 urr-id 6
    rating-group 102 service-identifier 202 urr-id 7

```

```
rating-group 103 service-identifier 203 urr-id 8
exit
ruledef rda1
  ip server-ip-address = 10.10.10.10
exit
ruledef rda10
  ip any-match = TRUE
exit
ruledef rda11
  ip any-match = TRUE
exit
ruledef rda12
  ip any-match = TRUE
exit
ruledef rda13
  ip any-match = TRUE
exit
ruledef rda2
  ip server-ip-address = 10.165.161.77/32
exit
ruledef rda20
  ip any-match = TRUE
exit
ruledef rda21
  ip any-match = TRUE
exit
ruledef rda22
  ip any-match = TRUE
exit
ruledef rda23
  ip any-match = TRUE
exit
ruledef rda3
  ip server-ip-address = 8.8.8.8/28
exit
ruledef rda40
  ip any-match = TRUE
exit
ruledef rda50
  ip server-ip-address = 50.50.50.50
exit
ruledef rda51
  ip server-ip-address = 51.51.51.51
exit
ruledef rda52
  ip server-ip-address = 52.52.52.52
exit
ruledef rda60
  ip dst-address = 60.60.60.60
exit
ruledef rda61
  ip dst-address = 61.61.61.61
exit
ruledef rda62
  ip dst-address = 62.62.62.62
exit
ruledef rdaPredefined
  ip any-match = TRUE
exit
ruledef rdaStatic
  ip any-match = TRUE
exit
ruledef rdaStatic1
  ip any-match = TRUE
```

```
exit
ruledef rdaStatic2
  ip any-match = TRUE
exit
ruledef rds1
  ip any-match = TRUE
exit
ruledef rds2
  ip any-match = TRUE
exit
credit-control group onlineoffline
  diameter ignore-service-id true
exit
exit
apn intershat
  gtpv group group1
  active-charging rulebase rbal
exit
gtpv group group1
  gtpv egcdr service-data-flow threshold interval 60
  gtpv egcdr service-data-flow threshold volume downlink 100000 uplink 100000 total 200000
apn intershat
gtpv group group1
exit
smiuser add-user username liadmin password Cisco@123
smiuser change-password username liadmin current_password Cisco@123 new_password Mitg_123
confirm_password Mitg_123
smiuser add-group groupname LI
smiuser assign-user-group username liadmin group LI
smiuser add-user username liadmin2 password Cisco@123
smiuser change-password username liadmin2 current_password Cisco@123 new_password Mitg_123
confirm_password Mitg_123
smiuser add-group groupname LI2
smiuser assign-user-group username liadmin2 group LI2
smiuser add-user username liadmin3 password Cisco@123
smiuser change-password username liadmin3 current_password Cisco@123 new_password Mitg_123
confirm_password Mitg_123
smiuser add-group groupname LI3
smiuser assign-user-group username liadmin3 group LI3
nacm groups group LI2
user-name [ liadmin2 ]
exit
nacm groups group LI3
user-name [ liadmin3 ]
exit
nacm rule-list lawful-intercept
group [ LI LI2 LI3 ]
commit
end
config
system mode running
commit
end
exit
```

