

## **OsmoHNBGW VTY Reference**

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	<i>TITLE :</i> OsmoHNBGW VTY Reference		
<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
WRITTEN BY		March 14, 2025	

<b>REVISION HISTORY</b>
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NUMBER	DATE	DESCRIPTION	NAME
DRAFT	unknown	Automatically Generated VTY Reference	dw

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## Chapter 1

# VTY reference

The Virtual Tele Type (VTY) has the concept of nodes and commands. This chapter lists all nodes and the commands that are available within the node. Each command can consist out of several words followed by a variable number of parameters. There are common patterns for the parameters, these include IPv4 addresses, number ranges, a word, a line of text and choice. The following will explain the commonly used patterns.

Pattern	Example	Explanation
A.B.C.D	127.0.0.1	A IPv4 address
TEXT	example01	A single string without any spaces, tabs
.TEXT	Some information	A line of text
(OptionA OptionB OptionC)	OptionA	A choice between a list of available options
<0-10>	5	A number from a range

Table 1.1: VTY Parameter Patterns

The application is configured through the VTY. For configuring a system one needs to enter the **enable** node and then enter the **configure terminal** command. Then the configuration can be made according to the available commands. After the system has been configured one can use the **write** command to write the new configuration to the configuration file. The new file will be used after the application has been restarted.

The following table lists the TCP port numbers of the VTY for the various Osmocom GSM related programs as used on sysmocom products:

Port Number	Software
4240	osmo-pcu
4241	osmo-bts
4242	osmo-nitb, osmo-bsc
4243	osmo-bsc_mgcp
4244	osmo-bsc_nat
4245	osmo-sgsn
4246	osmo-gbproxy

Table 1.2: VTY port numbers

### 1.1 Common Commands

These commands are available on all VTY nodes. They are listed here only once, to unclutter the VTY reference.

### 1.1.1 end

#### Command

```
end
```

#### Parameters

end

End current mode and change to enable mode.

### 1.1.2 exit

#### Command

```
exit
```

#### Parameters

exit

Exit current mode and down to previous mode

### 1.1.3 help

#### Command

```
help
```

#### Parameters

help

Description of the interactive help system

### 1.1.4 list [with-flags]

#### Command

```
list [with-flags]
```

#### Parameters

list

Print command list

[with-flags]

Also print the VTY attribute flags

---



### 1.1.5 show running-config

#### Command

```
show running-config
```

#### Parameters

##### show

Show running system information

##### running-config

running configuration

### 1.1.6 show vty-attributes

#### Command

```
show vty-attributes
```

#### Parameters

##### show

Show running system information

##### vty-attributes

List of VTY attributes

### 1.1.7 show vty-attributes (application|library|global)

#### Command

```
show vty-attributes (application|library|global)
```

#### Parameters

##### show

Show running system information

##### vty-attributes

List of VTY attributes

##### application

Application specific attributes only

##### library

Library specific attributes only

##### global

Global attributes only

---

### 1.1.8 write

Command

```
write
```

Parameters

write

Write running configuration to memory, network, or terminal

### 1.1.9 write file [PATH]

Command

```
write file [PATH]
```

Parameters

write

Write running configuration to memory, network, or terminal

file

Write to configuration file

[PATH]

Set file path to store the config, or replace if already exists

### 1.1.10 write memory

Command

```
write memory
```

Parameters

write

Write running configuration to memory, network, or terminal

memory

Write configuration to the file (same as write file)

### 1.1.11 write terminal

Command

```
write terminal
```

Parameters

write

Write running configuration to memory, network, or terminal

terminal

Write to terminal

## 1.2 view

The view node is the default node when connecting to the VTY interface. This node does not require any additional permission and allows to introspect the application.

### 1.2.1 enable [expert-mode]

Command

```
enable [expert-mode]
```

Parameters

enable

Turn on privileged mode command

[expert-mode]

Enable the expert mode (show hidden commands)

### 1.2.2 logging color (0|1)

Command

```
logging color (0|1)
```

Parameters

logging

Configure logging

color

Configure color-printing for log messages

0

Don't use color for printing messages

1

Use color for printing messages

### 1.2.3 logging disable

Command

```
logging disable
```

Parameters

logging

Configure logging

disable

Disables logging to this vty

---

### 1.2.4 logging enable

This command is required to make logging commands available on the telnet VTY.

#### Command

```
logging enable
```

#### Parameters

##### logging

Configure logging

##### enable

Enables logging to this vty

### 1.2.5 logging filter all (0|1)

Disable/enable general log output on a given target. Typically, 'logging filter all 1' allows to see the usual log output on a given target. Setting to '0' can be useful when logging to the telnet VTY console: mute all log output to allow typing VTY commands on the telnet prompt without interference from log output; 'logging filter all 1' then re-enables logging in the same log output configuration as before. Some applications provide more specific filters, e.g. to log a given IMSI only. To employ such filters, set 'logging filter all 0' to disable general logging, and then enable a more specific filter instead.

#### Command

```
logging filter all (0|1)
```

#### Parameters

##### logging

Configure logging

##### filter

Filter log messages

##### all

Do you want to log all messages?

##### 0

Only print messages matched by other filters

##### 1

Bypass filter and print all messages

### 1.2.6 logging level (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|l...

#### Command

```
logging level (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|lmib| ↵
lsms|lctrl|lgtpl|lstats|lgsup|loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lns| ↵
lbssgp|lnsdata|lnssignal|liuup|lpfcp|lcsn1|lio) (debug|info|notice|error|fatal)
```

## Parameters

### logging

Configure logging

### level

Set the log level for a specified category

### main

Main program

### hnbap

Home Node B Application Part

### rua

RANAP User Adaptation

### ranap

RAN Application Part

### mgw

Media Gateway

### hnb

HNB side (via RUA)

### cn

Core Network side (via SCCP)

### nft

nftables interaction for retrieving stats

### lglobal

Library-internal global log family

### llapd

LAPD in libosmogsm

### linp

A-bis Input Subsystem

### lmux

A-bis B-Subchannel TRAU Frame Multiplex

### lmi

A-bis Input Driver for Signalling

### lmib

A-bis Input Driver for B-Channels (voice)

### lsms

Layer3 Short Message Service (SMS)

### lctrl

Control Interface

### lgtp

GPRS GTP library

---

lstats

Statistics messages and logging

lgsup

Generic Subscriber Update Protocol

loap

Osmocom Authentication Protocol

lss7

libosmo-sigtran Signalling System 7

lsccp

libosmo-sigtran SCCP Implementation

lsua

libosmo-sigtran SCCP User Adaptation

lm3ua

libosmo-sigtran MTP3 User Adaptation

lmgcp

libosmo-mgcp Media Gateway Control Protocol

ljibuf

libosmo-netif Jitter Buffer

lrspro

Remote SIM protocol

lns

GPRS NS layer

lbssgp

GPRS BSSGP layer

lnsdata

GPRS NS layer data PDU

lnssignal

GPRS NS layer signal PDU

liuup

Iu UP layer

lpfcp

libosmo-pfcp Packet Forwarding Control Protocol

lcsn1

libosmo-csn1 Concrete Syntax Notation 1 codec

lio

libosmocore IO Subsystem

debug

Log debug messages and higher levels

---

info

Log informational messages and higher levels

notice

Log noticeable messages and higher levels

error

Log error messages and higher levels

fatal

Log only fatal messages

### 1.2.7 logging level force-all (debug|info|notice|error|fatal)

Command

```
logging level force-all (debug|info|notice|error|fatal)
```

Parameters

logging

Configure logging

level

Set the log level for a specified category

force-all

Globally force all logging categories to a specific level. This is released by the 'no logging level force-all' command. Note: any 'logging level <category> <level>' commands will have no visible effect after this, until the forced level is released.

debug

Log debug messages and higher levels

info

Log informational messages and higher levels

notice

Log noticeable messages and higher levels

error

Log error messages and higher levels

fatal

Log only fatal messages

### 1.2.8 logging level set-all (debug|info|notice|error|fatal)

Command

```
logging level set-all (debug|info|notice|error|fatal)
```

Parameters

---

## logging

Configure logging

## level

Set the log level for a specified category

## set-all

Once-off set all categories to the given log level. There is no single command to take back these changes -- each category is set to the given level, period.

## debug

Log debug messages and higher levels

## info

Log informational messages and higher levels

## notice

Log noticeable messages and higher levels

## error

Log error messages and higher levels

## fatal

Log only fatal messages

### 1.2.9 logging print category (0|1)

#### Command

```
logging print category (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### category

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with category/subsystem name

---



### 1.2.10 logging print category-hex (0|1)

#### Command

```
logging print category-hex (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### category-hex

Configure log message

0

Don't prefix each log message

1

Prefix each log message with category/subsystem nr in hex ('<000b>')

### 1.2.11 logging print extended-timestamp (0|1)

#### Command

```
logging print extended-timestamp (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### extended-timestamp

Configure log message timestamping

0

Don't prefix each log message

1

Prefix each log message with current timestamp with YYYYMMDDhhmmssnnn

### 1.2.12 logging print file (0|1|basename) [last]

#### Command

```
logging print file (0|1|basename) [last]
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### file

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with the source file and line

##### basename

Prefix each log message with the source file's basename (strip leading paths) and line

##### [last]

Log source file info at the end of a log line. If omitted, log source file info just before the log text.

### 1.2.13 logging print level (0|1)

#### Command

```
logging print level (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### level

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with the log level name

---

### 1.2.14 logging print thread-id (0|1)

#### Command

```
logging print thread-id (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### thread-id

Configure log message logging Thread ID

0

Don't prefix each log message

1

Prefix each log message with current Thread ID

### 1.2.15 logging set-log-mask MASK

#### Command

```
logging set-log-mask MASK
```

#### Parameters

##### logging

Configure logging

##### set-log-mask

Set the logmask of this logging target

##### MASK

List of logging categories to log, e.g. 'abc:mno:xyz'. Available log categories depend on the specific application, refer to the 'logging level' command. Optionally add individual log levels like 'abc,1:mno,3:xyz,5', where the level numbers are LOGL\_DEBUG=1 LOGL\_INFO=3 LOGL\_NOTICE=5 LOGL\_ERROR=7 LOGL\_FATAL=8

### 1.2.16 logging timestamp (0|1)

#### Command

```
logging timestamp (0|1)
```

#### Parameters

---

**logging**

Configure logging

**timestamp**

Configure log message timestamping

0

Don't prefix each log message

1

Prefix each log message with current timestamp

**1.2.17 logp (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|lmib|lsms|...****Command**

```
logp (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl| ↵
      lgtp|lstats|lgsup|loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lns|lbssgp|lndata ↵
      |lnssignal|liuup|lpfcp|lcsn1|lio) (debug|info|notice|error|fatal) .LOGMESSAGE
```

**Parameters****logp**

Print a message on all log outputs; useful for placing markers in test logs

**main**

Main program

**hnbap**

Home Node B Application Part

**rua**

RANAP User Adaptation

**ranap**

RAN Application Part

**mgw**

Media Gateway

**hnb**

HNB side (via RUA)

**cn**

Core Network side (via SCCP)

**nft**

nftables interaction for retrieving stats

**lglobal**

Library-internal global log family

**llapd**

LAPD in libosmogsm

---

linp  
A-bis Input Subsystem

lmux  
A-bis B-Subchannel TRAU Frame Multiplex

lmi  
A-bis Input Driver for Signalling

lmib  
A-bis Input Driver for B-Channels (voice)

lsms  
Layer3 Short Message Service (SMS)

lctrl  
Control Interface

lgtp  
GPRS GTP library

lstats  
Statistics messages and logging

lgsup  
Generic Subscriber Update Protocol

loap  
Osmocom Authentication Protocol

lss7  
libosmo-sigtran Signalling System 7

lsccp  
libosmo-sigtran SCCP Implementation

lsua  
libosmo-sigtran SCCP User Adaptation

lm3ua  
libosmo-sigtran MTP3 User Adaptation

lmgcp  
libosmo-mgcp Media Gateway Control Protocol

ljibuf  
libosmo-netif Jitter Buffer

lrspro  
Remote SIM protocol

lns  
GPRS NS layer

lbssgp  
GPRS BSSGP layer

---

Insdata

GPRS NS layer data PDU

Innsignal

GPRS NS layer signal PDU

Iuup

Iu UP layer

lpfcp

libosmo-pfcp Packet Forwarding Control Protocol

lcsn1

libosmo-csn1 Concrete Syntax Notation 1 codec

lio

libosmocore IO Subsystem

debug

Log debug messages and higher levels

info

Log informational messages and higher levels

notice

Log noticeable messages and higher levels

error

Log error messages and higher levels

fatal

Log only fatal messages

.LOGMESSAGE

Arbitrary message to log on given category and log level

### 1.2.18 no logging level force-all

Command

```
no logging level force-all
```

Parameters

no

Negate a command or set its defaults

logging

Configure logging

level

Set the log level for a specified category

force-all

Release any globally forced log level set with 'logging level force-all <level>'

### 1.2.19 show alarms

#### Command

```
show alarms
```

#### Parameters

##### show

Show running system information

##### alarms

Show current logging configuration

### 1.2.20 show asciidoc counters

#### Command

```
show asciidoc counters
```

#### Parameters

##### show

Show running system information

##### asciidoc

Asciidoc generation

##### counters

Generate table of all registered counters

### 1.2.21 show cnlink

#### Command

```
show cnlink
```

#### Parameters

##### show

Show running system information

##### cnlink

Display information on core network link

### 1.2.22 show cs7 (sua|m3ua|ipa) (sctp|tcp) [<0-65534>]

#### Command

```
show cs7 (sua|m3ua|ipa) (sctp|tcp) [<0-65534>]
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

sua

SCCP User Adaptation

m3ua

MTP3 User Adaptation

ipa

IPA Multiplex (SCCP Lite)

sctp

SCTP (Stream Control Transmission Protocol)

tcp

TCP (Transmission Control Protocol)

[<0-65534>]

Local Port Number

### 1.2.23 show cs7 (sua|m3ua|ipa) [<0-65534>]

#### Command

```
show cs7 (sua|m3ua|ipa) [<0-65534>]
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

sua

SCCP User Adaptation

m3ua

MTP3 User Adaptation

ipa

IPA Multiplex (SCCP Lite)

[<0-65534>]

Local Port Number



### 1.2.24 show cs7 config

#### Command

```
show cs7 config
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

config

Currently running cs7 configuration

### 1.2.25 show cs7 instance <0-15> as (active|all|m3ua|sua)

#### Command

```
show cs7 instance <0-15> as (active|all|m3ua|sua)
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

as

Application Server (AS)

active

Display all active ASs

all

Display all ASs (default)

m3ua

Display all m3ua ASs

sua

Display all SUA ASs

### 1.2.26 show cs7 instance <0-15> as binding-table name AS\_NAME

#### Command

```
show cs7 instance <0-15> as binding-table name AS_NAME
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

as

Application Server (AS)

binding-table

Display binding table

name

Look up AS with a given name

AS\_NAME

Name of the Application Server (AS)

### 1.2.27 show cs7 instance <0-15> as name AS\_NAME

#### Command

```
show cs7 instance <0-15> as name AS_NAME
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

as

Application Server (AS)

---

name

Look up AS with a given name

AS\_NAME

Name of the Application Server (AS)

### 1.2.28 show cs7 instance <0-15> asp

Command

```
show cs7 instance <0-15> asp
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

asp

Application Server Process (ASP)

### 1.2.29 show cs7 instance <0-15> asp name ASP\_NAME

Command

```
show cs7 instance <0-15> asp name ASP_NAME
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

asp

Application Server Process (ASP)

name

Lookup ASP with a given name

ASP\_NAME

Name of the Application Server Process (ASP)

---

### 1.2.30 show cs7 instance <0-15> asp-assoc-status

#### Command

```
show cs7 instance <0-15> asp-assoc-status
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

asp-assoc-status

Application Server Process (ASP) SCTP association status

### 1.2.31 show cs7 instance <0-15> asp-assoc-status name ASP\_NAME

#### Command

```
show cs7 instance <0-15> asp-assoc-status name ASP_NAME
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

asp-assoc-status

Application Server Process (ASP) SCTP association information

name

Lookup ASP with a given name

ASP\_NAME

Name of the Application Server Process (ASP)

---

### 1.2.32 show cs7 instance <0-15> asp-remaddr

#### Command

```
show cs7 instance <0-15> asp-remaddr
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp-remaddr

Application Server Process (ASP) remote addresses information

### 1.2.33 show cs7 instance <0-15> asp-remaddr name ASP\_NAME

#### Command

```
show cs7 instance <0-15> asp-remaddr name ASP_NAME
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp-remaddr

Application Server Process (ASP) remote addresses information

##### name

Lookup ASP with a given name

##### ASP\_NAME

Name of the Application Server Process (ASP)

---

### 1.2.34 show cs7 instance <0-15> route [POINT\_CODE]

#### Command

```
show cs7 instance <0-15> route [POINT_CODE]
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### route

Routing Table

##### [POINT\_CODE]

Destination Point Code

### 1.2.35 show cs7 instance <0-15> route binding-table [POINT\_CODE] [all-matches]

#### Command

```
show cs7 instance <0-15> route binding-table [POINT_CODE] [all-matches]
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### route

Routing Table

##### binding-table

Display binding table

##### [POINT\_CODE]

Destination Point Code

##### [all-matches]

Display all matching Combination Links

---

### 1.2.36 show cs7 instance <0-15> route-lookup POINT\_CODE from POINT\_CODE sls <0-15> [lis...

#### Command

```
show cs7 instance <0-15> route-lookup POINT_CODE from POINT_CODE sls <0-15> [list-asps]
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

route-lookup

Look up route

POINT\_CODE

Destination PC

from

From

POINT\_CODE

Origin PC

sls

SLS

<0-15>

SLS value

[list-asps]

List ASPs of the AS if route points to an AS

### 1.2.37 show cs7 instance <0-15> sccp addressbook

#### Command

```
show cs7 instance <0-15> sccp addressbook
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

addressbook

List all SCCP addressbook entries

### 1.2.38 show cs7 instance <0-15> sccp connections

Command

```
show cs7 instance <0-15> sccp connections
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

connections

Show List of active SCCP connections

### 1.2.39 show cs7 instance <0-15> sccp ssn <0-65535>

Command

```
show cs7 instance <0-15> sccp ssn <0-65535>
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7



instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

ssn

Find an SCCP User registered for the given SSN

<0-65535>

Subsystem Number (SSN)

### 1.2.40 show cs7 instance <0-15> sccp timers

Command

```
show cs7 instance <0-15> sccp timers
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signaling Connection Control Part

timers

Show List of SCCP timers

### 1.2.41 show cs7 instance <0-15> sccp users

Command

```
show cs7 instance <0-15> sccp users
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

users

Show List of SCCP Users registered

### 1.2.42 show cs7 instance <0-15> users

Command

```
show cs7 instance <0-15> users
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

users

User Table

### 1.2.43 show fsm NAME

Command

```
show fsm NAME
```

Parameters

show

Show running system information

fsm

Show information about finite state machines

NAME

Display information about a single named finite state machine

### 1.2.44 show fsm all

#### Command

```
show fsm all
```

#### Parameters

##### show

Show running system information

##### fsm

Show information about finite state machines

##### all

Display a list of all registered finite state machines

### 1.2.45 show fsm-instances NAME

#### Command

```
show fsm-instances NAME
```

#### Parameters

##### show

Show running system information

##### fsm-instances

Show information about finite state machine instances

##### NAME

Display a list of all FSM instances of the named finite state machine

### 1.2.46 show fsm-instances all

#### Command

```
show fsm-instances all
```

#### Parameters

##### show

Show running system information

##### fsm-instances

Show information about finite state machine instances

##### all

Display a list of all FSM instances of all finite state machine

---

### 1.2.47 show fsm-state-graph NAME

#### Command

```
show fsm-state-graph NAME
```

#### Parameters

show

Show running system information

fsm-state-graph

Generate a state transition graph (using DOT language)

NAME

FSM name

### 1.2.48 show history

#### Command

```
show history
```

#### Parameters

show

Show running system information

history

Display the session command history

### 1.2.49 show hnb NAME

#### Command

```
show hnb NAME
```

#### Parameters

show

Show running system information

hnb

Display information about HNB

NAME

HNB name

### 1.2.50 show hnb all

#### Command

```
show hnb all
```

#### Parameters

##### show

Show running system information

##### hnb

Display information about HNB

##### all

All HNB

### 1.2.51 show logging vty

#### Command

```
show logging vty
```

#### Parameters

##### show

Show running system information

##### logging

Show current logging configuration

##### vtty

Show current logging configuration for this vty

### 1.2.52 show mgw-pool

#### Command

```
show mgw-pool
```

#### Parameters

##### show

Show running system information

##### mgw-pool

Display information about the MGW-Pool

---

### 1.2.53 show nri

#### Command

```
show nri
```

#### Parameters

##### show

Show running system information

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

### 1.2.54 show online-help

#### Command

```
show online-help
```

#### Parameters

##### show

Show running system information

##### online-help

Online help

### 1.2.55 show pid

#### Command

```
show pid
```

#### Parameters

##### show

Show running system information

##### pid

Displays the process ID

### 1.2.56 show rate-counters [skip-zero]

#### Command

```
show rate-counters [skip-zero]
```

#### Parameters

##### show

Show running system information

##### rate-counters

Show all rate counters

##### [skip-zero]

Skip items with total count zero

### 1.2.57 show stats [skip-zero]

#### Command

```
show stats [skip-zero]
```

#### Parameters

##### show

Show running system information

##### stats

Show statistical values

##### [skip-zero]

Skip items with total count zero

### 1.2.58 show stats level (global|peer|subscriber) [skip-zero]

#### Command

```
show stats level (global|peer|subscriber) [skip-zero]
```

#### Parameters

##### show

Show running system information

##### stats

Show statistical values

##### level

Set the maximum group level

---

global

Show global groups only

peer

Show global and network peer related groups

subscriber

Show global, peer, and subscriber groups

[skip-zero]

Skip items with total count zero

### 1.2.59 show talloc

Command

```
show talloc
```

Parameters

show

Show running system information

talloc

Display talloc info

### 1.2.60 show talloc-context (application|global|all) (full|brief|DEPTH)

Command

```
show talloc-context (application|global|all) (full|brief|DEPTH)
```

Parameters

show

Show running system information

talloc-context

Show talloc memory hierarchy

application

Application's context

global

Global context (OTC\_GLOBAL)

all

All contexts, if NULL-context tracking is enabled

full

Display a full talloc memory hierarchy

brief

Display a brief talloc memory hierarchy

DEPTH

Specify required maximal depth value

---



### 1.2.61 show talloc-context (application|global|all) (full|brief|DEPTH) filter REGEXP

#### Command

```
show talloc-context (application|global|all) (full|brief|DEPTH) filter REGEXP
```

#### Parameters

##### show

Show running system information

##### talloc-context

Show talloc memory hierarchy

##### application

Application's context

##### global

Global context (OTC\_GLOBAL)

##### all

All contexts, if NULL-context tracking is enabled

##### full

Display a full talloc memory hierarchy

##### brief

Display a brief talloc memory hierarchy

##### DEPTH

Specify required maximal depth value

##### filter

Filter chunks using regular expression

##### REGEXP

Regular expression

### 1.2.62 show talloc-context (application|global|all) (full|brief|DEPTH) tree ADDRESS

#### Command

```
show talloc-context (application|global|all) (full|brief|DEPTH) tree ADDRESS
```

#### Parameters

##### show

Show running system information

##### talloc-context

Show talloc memory hierarchy

##### application

Application's context

global

Global context (OTC\_GLOBAL)

all

All contexts, if NULL-context tracking is enabled

full

Display a full talloc memory hierarchy

brief

Display a brief talloc memory hierarchy

DEPTH

Specify required maximal depth value

tree

Display only a specific memory chunk

ADDRESS

Chunk address (e.g. 0xdeadbeef)

### 1.2.63 show timer [(mgw|hnbgw|pfcf)] [TNNNN]

Command

```
show timer [(mgw|hnbgw|pfcf)] [TNNNN]
```

Parameters

show

Show running system information

timer

Show timers

[mgw]

MGW (Media Gateway) interface

[hnbgw]

Timers

[pfcf]

PFCE timers

[TNNNN]

T- or X-timer-number -- 3GPP compliant timer number of the format '1234' or 'T1234' or 't1234'; Osmocom-specific timer number of the format: 'X1234' or 'x1234'.

### 1.2.64 show uptime

#### Command

```
show uptime
```

#### Parameters

##### show

Show running system information

##### uptime

Displays how long the program has been running

### 1.2.65 show version

#### Command

```
show version
```

#### Parameters

##### show

Show running system information

##### version

Displays program version

### 1.2.66 terminal length <0-512>

#### Command

```
terminal length <0-512>
```

#### Parameters

##### terminal

Set terminal line parameters

##### length

Set number of lines on a screen

##### <0-512>

Number of lines on screen (0 for no pausing)

---

### 1.2.67 terminal no length

#### Command

```
terminal no length
```

#### Parameters

##### terminal

Set terminal line parameters

##### no

Negate a command or set its defaults

##### length

Set number of lines on a screen

### 1.2.68 who

#### Command

```
who
```

#### Parameters

##### who

Display who is on vty

## 1.3 enable

The enable node is a privileged node, allowing to make changes to the configuration and to access further commands like 'configure'. All commands seen on the view node are also available here.

### 1.3.1 (msc|sgsn) <0-1000> ranap reset

#### Command

```
(msc|sgsn) <0-1000> ranap reset
```

#### Parameters

##### msc

Manipulate an IuCS link to an MSC

##### sgsn

Manipulate an IuPS link to an SGSN

##### <0-1000>

MSC/SGSN nr

##### ranap

Manipulate RANAP layer of Iu-interface

##### reset

Flip this CN link to disconnected state and re-send RANAP RESET

---

### 1.3.2 configure [terminal]

#### Command

```
configure [terminal]
```

#### Parameters

##### configure

Configuration from vty interface

##### [terminal]

Configuration terminal

### 1.3.3 copy running-config startup-config

#### Command

```
copy running-config startup-config
```

#### Parameters

##### copy

Copy configuration

##### running-config

Copy running config to...

##### startup-config

Copy running config to startup config (same as write file)

### 1.3.4 cs7 instance <0-15> asp NAME disconnect

#### Command

```
cs7 instance <0-15> asp NAME disconnect
```

#### Parameters

##### cs7

ITU-T Signaling System 7

##### instance

Instance related commands

##### <0-15>

SS7 Instance Number

##### asp

ASP related commands

##### NAME

Name of ASP

##### disconnect

Disconnect the ASP (client will reconnect)

---

### 1.3.5 disable

#### Command

```
disable
```

#### Parameters

##### disable

Turn off privileged mode command

### 1.3.6 logging color (0|1)

#### Command

```
logging color (0|1)
```

#### Parameters

##### logging

Configure logging

##### color

Configure color-printing for log messages

##### 0

Don't use color for printing messages

##### 1

Use color for printing messages

### 1.3.7 logging disable

#### Command

```
logging disable
```

#### Parameters

##### logging

Configure logging

##### disable

Disables logging to this vty

### 1.3.8 logging enable

This command is required to make logging commands available on the telnet VTY.

#### Command

```
logging enable
```

#### Parameters

##### logging

Configure logging

##### enable

Enables logging to this vty

### 1.3.9 logging filter all (0|1)

Disable/enable general log output on a given target. Typically, 'logging filter all 1' allows to see the usual log output on a given target. Setting to '0' can be useful when logging to the telnet VTY console: mute all log output to allow typing VTY commands on the telnet prompt without interference from log output; 'logging filter all 1' then re-enables logging in the same log output configuration as before. Some applications provide more specific filters, e.g. to log a given IMSI only. To employ such filters, set 'logging filter all 0' to disable general logging, and then enable a more specific filter instead.

#### Command

```
logging filter all (0|1)
```

#### Parameters

##### logging

Configure logging

##### filter

Filter log messages

##### all

Do you want to log all messages?

##### 0

Only print messages matched by other filters

##### 1

Bypass filter and print all messages

### 1.3.10 logging level (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|l...

#### Command

```
logging level (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|lmib| ↵
lsms|lctrl|lgtpl|lstats|lgsup|loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lns| ↵
lbssgp|lnsdata|lnssignal|liuup|lpfcp|lcsn1|lio) (debug|info|notice|error|fatal)
```

## Parameters

### logging

Configure logging

### level

Set the log level for a specified category

### main

Main program

### hnbap

Home Node B Application Part

### rua

RANAP User Adaptation

### ranap

RAN Application Part

### mgw

Media Gateway

### hnb

HNB side (via RUA)

### cn

Core Network side (via SCCP)

### nft

nftables interaction for retrieving stats

### lglobal

Library-internal global log family

### llapd

LAPD in libosmogsm

### linp

A-bis Input Subsystem

### lmux

A-bis B-Subchannel TRAU Frame Multiplex

### lmi

A-bis Input Driver for Signalling

### lmib

A-bis Input Driver for B-Channels (voice)

### lsms

Layer3 Short Message Service (SMS)

### lctrl

Control Interface

### lgtp

GPRS GTP library

---



lstats

Statistics messages and logging

lgsup

Generic Subscriber Update Protocol

loap

Osmocom Authentication Protocol

lss7

libosmo-sigtran Signalling System 7

lsccp

libosmo-sigtran SCCP Implementation

lsua

libosmo-sigtran SCCP User Adaptation

lm3ua

libosmo-sigtran MTP3 User Adaptation

lmgcp

libosmo-mgcp Media Gateway Control Protocol

ljibuf

libosmo-netif Jitter Buffer

lrspro

Remote SIM protocol

lns

GPRS NS layer

lbssgp

GPRS BSSGP layer

lnsdata

GPRS NS layer data PDU

lnssignal

GPRS NS layer signal PDU

liuup

Iu UP layer

lpfcp

libosmo-pfcp Packet Forwarding Control Protocol

lcsn1

libosmo-csn1 Concrete Syntax Notation 1 codec

lio

libosmocore IO Subsystem

debug

Log debug messages and higher levels

**info**

Log informational messages and higher levels

**notice**

Log noticeable messages and higher levels

**error**

Log error messages and higher levels

**fatal**

Log only fatal messages

### 1.3.11 logging level force-all (debug|info|notice|error|fatal)

**Command**

```
logging level force-all (debug|info|notice|error|fatal)
```

**Parameters****logging**

Configure logging

**level**

Set the log level for a specified category

**force-all**

Globally force all logging categories to a specific level. This is released by the 'no logging level force-all' command. Note: any 'logging level <category> <level>' commands will have no visible effect after this, until the forced level is released.

**debug**

Log debug messages and higher levels

**info**

Log informational messages and higher levels

**notice**

Log noticeable messages and higher levels

**error**

Log error messages and higher levels

**fatal**

Log only fatal messages

### 1.3.12 logging level set-all (debug|info|notice|error|fatal)

**Command**

```
logging level set-all (debug|info|notice|error|fatal)
```

**Parameters**

---

## logging

Configure logging

## level

Set the log level for a specified category

## set-all

Once-off set all categories to the given log level. There is no single command to take back these changes -- each category is set to the given level, period.

## debug

Log debug messages and higher levels

## info

Log informational messages and higher levels

## notice

Log noticeable messages and higher levels

## error

Log error messages and higher levels

## fatal

Log only fatal messages

### 1.3.13 logging print category (0|1)

#### Command

```
logging print category (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### category

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with category/subsystem name

### 1.3.14 logging print category-hex (0|1)

#### Command

```
logging print category-hex (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### category-hex

Configure log message

0

Don't prefix each log message

1

Prefix each log message with category/subsystem nr in hex ('<000b>')

### 1.3.15 logging print extended-timestamp (0|1)

#### Command

```
logging print extended-timestamp (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### extended-timestamp

Configure log message timestamping

0

Don't prefix each log message

1

Prefix each log message with current timestamp with YYYYMMDDhhmmssnnn

### 1.3.16 logging print file (0|1|basename) [last]

#### Command

```
logging print file (0|1|basename) [last]
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### file

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with the source file and line

##### basename

Prefix each log message with the source file's basename (strip leading paths) and line

##### [last]

Log source file info at the end of a log line. If omitted, log source file info just before the log text.

### 1.3.17 logging print level (0|1)

#### Command

```
logging print level (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### level

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with the log level name

### 1.3.18 logging print thread-id (0|1)

#### Command

```
logging print thread-id (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### thread-id

Configure log message logging Thread ID

0

Don't prefix each log message

1

Prefix each log message with current Thread ID

### 1.3.19 logging set-log-mask MASK

#### Command

```
logging set-log-mask MASK
```

#### Parameters

##### logging

Configure logging

##### set-log-mask

Set the logmask of this logging target

##### MASK

List of logging categories to log, e.g. 'abc:mno:xyz'. Available log categories depend on the specific application, refer to the 'logging level' command. Optionally add individual log levels like 'abc,1:mno,3:xyz,5', where the level numbers are LOGL\_DEBUG=1 LOGL\_INFO=3 LOGL\_NOTICE=5 LOGL\_ERROR=7 LOGL\_FATAL=8

### 1.3.20 logging timestamp (0|1)

#### Command

```
logging timestamp (0|1)
```

#### Parameters

---

**logging**

Configure logging

**timestamp**

Configure log message timestamping

0

Don't prefix each log message

1

Prefix each log message with current timestamp

**1.3.21 logp (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|lmib|lsms|...****Command**

```
logp (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl| ↵
      lgtp|lstats|lgsup|loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lns|lbssgp|lndata ↵
      |lnssignal|liuup|lpfcp|lcsn1|lio) (debug|info|notice|error|fatal) .LOGMESSAGE
```

**Parameters****logp**

Print a message on all log outputs; useful for placing markers in test logs

**main**

Main program

**hnbap**

Home Node B Application Part

**rua**

RANAP User Adaptation

**ranap**

RAN Application Part

**mgw**

Media Gateway

**hnb**

HNB side (via RUA)

**cn**

Core Network side (via SCCP)

**nft**

nftables interaction for retrieving stats

**lglobal**

Library-internal global log family

**llapd**

LAPD in libosmogsm

---

linp  
A-bis Input Subsystem

lmux  
A-bis B-Subchannel TRAU Frame Multiplex

lmi  
A-bis Input Driver for Signalling

lmib  
A-bis Input Driver for B-Channels (voice)

lsms  
Layer3 Short Message Service (SMS)

lctrl  
Control Interface

lgtp  
GPRS GTP library

lstats  
Statistics messages and logging

lgsup  
Generic Subscriber Update Protocol

loap  
Osmocom Authentication Protocol

lss7  
libosmo-sigtran Signalling System 7

lsccp  
libosmo-sigtran SCCP Implementation

lsua  
libosmo-sigtran SCCP User Adaptation

lm3ua  
libosmo-sigtran MTP3 User Adaptation

lmgcp  
libosmo-mgcp Media Gateway Control Protocol

ljibuf  
libosmo-netif Jitter Buffer

lrspro  
Remote SIM protocol

lns  
GPRS NS layer

lbssgp  
GPRS BSSGP layer

---



Insdata

GPRS NS layer data PDU

Inssignal

GPRS NS layer signal PDU

Iuup

Iu UP layer

lpfcp

libosmo-pfcp Packet Forwarding Control Protocol

lcsn1

libosmo-csn1 Concrete Syntax Notation 1 codec

lio

libosmocore IO Subsystem

debug

Log debug messages and higher levels

info

Log informational messages and higher levels

notice

Log noticeable messages and higher levels

error

Log error messages and higher levels

fatal

Log only fatal messages

.LOGMESSAGE

Arbitrary message to log on given category and log level

### 1.3.22 mgw <0-255> block

Command

```
mgw <0-255> block
```

Global attributes

Flag: !

This command applies immediately

Parameters

mgw

Configure MGCP connection to Media Gateway

<0-255>

reference number

block

block MGCP client so that it won't be used for new calls

### 1.3.23 mgw <0-255> reconnect

#### Command

```
mgw <0-255> reconnect
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

mgw

Configure MGCP connection to Media Gateway

<0-255>

reference number

reconnect

reconfigure and reconnect MGCP client

### 1.3.24 mgw <0-255> unblock

#### Command

```
mgw <0-255> unblock
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

mgw

Configure MGCP connection to Media Gateway

<0-255>

reference number

unblock

unblock MGCP client so that it will be available for new calls

### 1.3.25 no logging level force-all

#### Command

```
no logging level force-all
```

#### Parameters

no

Negate a command or set its defaults

logging

Configure logging

level

Set the log level for a specified category

force-all

Release any globally forced log level set with 'logging level force-all <level>'

### 1.3.26 show alarms

#### Command

```
show alarms
```

#### Parameters

show

Show running system information

alarms

Show current logging configuration

### 1.3.27 show asciidoc counters

#### Command

```
show asciidoc counters
```

#### Parameters

show

Show running system information

asciidoc

Asciidoc generation

counters

Generate table of all registered counters

---

### 1.3.28 show cnlink

#### Command

```
show cnlink
```

#### Parameters

##### show

Show running system information

##### cnlink

Display information on core network link

### 1.3.29 show cs7 (sua|m3ua|ipa) (sctp|tcp) [<0-65534>]

#### Command

```
show cs7 (sua|m3ua|ipa) (sctp|tcp) [<0-65534>]
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### sua

SCCP User Adaptation

##### m3ua

MTP3 User Adaptation

##### ipa

IPA Multiplex (SCCP Lite)

##### sctp

SCTP (Stream Control Transmission Protocol)

##### tcp

TCP (Transmission Control Protocol)

##### [<0-65534>]

Local Port Number

---

### 1.3.30 show cs7 (sua|m3ua|ipa) [<0-65534>]

#### Command

```
show cs7 (sua|m3ua|ipa) [<0-65534>]
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### sua

SCCP User Adaptation

##### m3ua

MTP3 User Adaptation

##### ipa

IPA Multiplex (SCCP Lite)

##### [<0-65534>]

Local Port Number

### 1.3.31 show cs7 config

#### Command

```
show cs7 config
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### config

Currently running cs7 configuration

### 1.3.32 show cs7 instance <0-15> as (active|all|m3ua|sua)

#### Command

```
show cs7 instance <0-15> as (active|all|m3ua|sua)
```

#### Parameters

---

show  
    Show running system information

cs7  
    ITU-T Signaling System 7

instance  
    An instance of the SS7 stack

<0-15>  
    An instance of the SS7 stack

as  
    Application Server (AS)

active  
    Display all active ASs

all  
    Display all ASs (default)

m3ua  
    Display all m3ua ASs

sua  
    Display all SUA ASs

### 1.3.33 show cs7 instance <0-15> as binding-table name AS\_NAME

#### Command

```
show cs7 instance <0-15> as binding-table name AS_NAME
```

#### Parameters

show  
    Show running system information

cs7  
    ITU-T Signaling System 7

instance  
    An instance of the SS7 stack

<0-15>  
    An instance of the SS7 stack

as  
    Application Server (AS)

binding-table  
    Display binding table

name  
    Look up AS with a given name

AS\_NAME  
    Name of the Application Server (AS)

### 1.3.34 show cs7 instance <0-15> as name AS\_NAME

#### Command

```
show cs7 instance <0-15> as name AS_NAME
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### as

Application Server (AS)

##### name

Look up AS with a given name

##### AS\_NAME

Name of the Application Server (AS)

### 1.3.35 show cs7 instance <0-15> asp

#### Command

```
show cs7 instance <0-15> asp
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp

Application Server Process (ASP)

---

### 1.3.36 show cs7 instance <0-15> asp name ASP\_NAME

#### Command

```
show cs7 instance <0-15> asp name ASP_NAME
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp

Application Server Process (ASP)

##### name

Lookup ASP with a given name

##### ASP\_NAME

Name of the Application Server Process (ASP)

### 1.3.37 show cs7 instance <0-15> asp-assoc-status

#### Command

```
show cs7 instance <0-15> asp-assoc-status
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp-assoc-status

Application Server Process (ASP) SCTP association status

---



### 1.3.38 show cs7 instance <0-15> asp-assoc-status name ASP\_NAME

#### Command

```
show cs7 instance <0-15> asp-assoc-status name ASP_NAME
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp-assoc-status

Application Server Process (ASP) SCTP association information

##### name

Lookup ASP with a given name

##### ASP\_NAME

Name of the Application Server Process (ASP)

### 1.3.39 show cs7 instance <0-15> asp-remaddr

#### Command

```
show cs7 instance <0-15> asp-remaddr
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp-remaddr

Application Server Process (ASP) remote addresses information

---

### 1.3.40 show cs7 instance <0-15> asp-remaddr name ASP\_NAME

#### Command

```
show cs7 instance <0-15> asp-remaddr name ASP_NAME
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### asp-remaddr

Application Server Process (ASP) remote addresses information

##### name

Lookup ASP with a given name

##### ASP\_NAME

Name of the Application Server Process (ASP)

### 1.3.41 show cs7 instance <0-15> route [POINT\_CODE]

#### Command

```
show cs7 instance <0-15> route [POINT_CODE]
```

#### Parameters

##### show

Show running system information

##### cs7

ITU-T Signaling System 7

##### instance

An instance of the SS7 stack

##### <0-15>

An instance of the SS7 stack

##### route

Routing Table

##### [POINT\_CODE]

Destination Point Code

### 1.3.42 show cs7 instance <0-15> route binding-table [POINT\_CODE] [all-matches]

#### Command

```
show cs7 instance <0-15> route binding-table [POINT_CODE] [all-matches]
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

route

Routing Table

binding-table

Display binding table

[POINT\_CODE]

Destination Point Code

[all-matches]

Display all matching Combination Links

### 1.3.43 show cs7 instance <0-15> route-lookup POINT\_CODE from POINT\_CODE sls <0-15> [lis...

#### Command

```
show cs7 instance <0-15> route-lookup POINT_CODE from POINT_CODE sls <0-15> [list-asps]
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

route-lookup

Look up route

POINT\_CODE

Destination PC

from

From

POINT\_CODE

Origin PC

sls

SLS

<0-15>

SLS value

[list-asps]

List ASPs of the AS if route points to an AS

### 1.3.44 show cs7 instance <0-15> sccp addressbook

Command

```
show cs7 instance <0-15> sccp addressbook
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

addressbook

List all SCCP addressbook entries

### 1.3.45 show cs7 instance <0-15> sccp connections

Command

```
show cs7 instance <0-15> sccp connections
```

Parameters

---

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

connections

Show List of active SCCP connections

### 1.3.46 show cs7 instance <0-15> sccp ssn <0-65535>

Command

```
show cs7 instance <0-15> sccp ssn <0-65535>
```

Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

ssn

Find an SCCP User registered for the given SSN

<0-65535>

Subsystem Number (SSN)

### 1.3.47 show cs7 instance <0-15> sccp timers

#### Command

```
show cs7 instance <0-15> sccp timers
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signaling Connection Control Part

timers

Show List of SCCP timers

### 1.3.48 show cs7 instance <0-15> sccp users

#### Command

```
show cs7 instance <0-15> sccp users
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

sccp

Signalling Connection Control Part

users

Show List of SCCP Users registered

### 1.3.49 show cs7 instance <0-15> users

#### Command

```
show cs7 instance <0-15> users
```

#### Parameters

show

Show running system information

cs7

ITU-T Signaling System 7

instance

An instance of the SS7 stack

<0-15>

An instance of the SS7 stack

users

User Table

### 1.3.50 show fsm NAME

#### Command

```
show fsm NAME
```

#### Parameters

show

Show running system information

fsm

Show information about finite state machines

NAME

Display information about a single named finite state machine

### 1.3.51 show fsm all

#### Command

```
show fsm all
```

#### Parameters

show

Show running system information

fsm

Show information about finite state machines

all

Display a list of all registered finite state machines

---

### 1.3.52 show fsm-instances NAME

#### Command

```
show fsm-instances NAME
```

#### Parameters

##### show

Show running system information

##### fsm-instances

Show information about finite state machine instances

##### NAME

Display a list of all FSM instances of the named finite state machine

### 1.3.53 show fsm-instances all

#### Command

```
show fsm-instances all
```

#### Parameters

##### show

Show running system information

##### fsm-instances

Show information about finite state machine instances

##### all

Display a list of all FSM instances of all finite state machine

### 1.3.54 show fsm-state-graph NAME

#### Command

```
show fsm-state-graph NAME
```

#### Parameters

##### show

Show running system information

##### fsm-state-graph

Generate a state transition graph (using DOT language)

##### NAME

FSM name

---



### 1.3.55 show history

#### Command

```
show history
```

#### Parameters

##### show

Show running system information

##### history

Display the session command history

### 1.3.56 show hnb NAME

#### Command

```
show hnb NAME
```

#### Parameters

##### show

Show running system information

##### hnb

Display information about HNB

##### NAME

HNB name

### 1.3.57 show hnb all

#### Command

```
show hnb all
```

#### Parameters

##### show

Show running system information

##### hnb

Display information about HNB

##### all

All HNB

---

### 1.3.58 show logging vty

#### Command

```
show logging vty
```

#### Parameters

##### show

Show running system information

##### logging

Show current logging configuration

##### vtty

Show current logging configuration for this vty

### 1.3.59 show mgw-pool

#### Command

```
show mgw-pool
```

#### Parameters

##### show

Show running system information

##### mgw-pool

Display information about the MGW-Pool

### 1.3.60 show nri

#### Command

```
show nri
```

#### Parameters

##### show

Show running system information

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

---

### 1.3.61 show online-help

#### Command

```
show online-help
```

#### Parameters

##### show

Show running system information

##### online-help

Online help

### 1.3.62 show rate-counters [skip-zero]

#### Command

```
show rate-counters [skip-zero]
```

#### Parameters

##### show

Show running system information

##### rate-counters

Show all rate counters

##### [skip-zero]

Skip items with total count zero

### 1.3.63 show startup-config

#### Command

```
show startup-config
```

#### Parameters

##### show

Show running system information

##### startup-config

Contentes of startup configuration

---

### 1.3.64 show stats [skip-zero]

#### Command

```
show stats [skip-zero]
```

#### Parameters

##### show

Show running system information

##### stats

Show statistical values

##### [skip-zero]

Skip items with total count zero

### 1.3.65 show stats level (global|peer|subscriber) [skip-zero]

#### Command

```
show stats level (global|peer|subscriber) [skip-zero]
```

#### Parameters

##### show

Show running system information

##### stats

Show statistical values

##### level

Set the maximum group level

##### global

Show global groups only

##### peer

Show global and network peer related groups

##### subscriber

Show global, peer, and subscriber groups

##### [skip-zero]

Skip items with total count zero

---

### 1.3.66 show talloc

#### Command

```
show talloc
```

#### Parameters

##### show

Show running system information

##### talloc

Display talloc info

### 1.3.67 show talloc-context (application|global|all) (full|brief|DEPTH)

#### Command

```
show talloc-context (application|global|all) (full|brief|DEPTH)
```

#### Parameters

##### show

Show running system information

##### talloc-context

Show talloc memory hierarchy

##### application

Application's context

##### global

Global context (OTC\_GLOBAL)

##### all

All contexts, if NULL-context tracking is enabled

##### full

Display a full talloc memory hierarchy

##### brief

Display a brief talloc memory hierarchy

##### DEPTH

Specify required maximal depth value

---

### 1.3.68 show talloc-context (application|global|all) (full|brief|DEPTH) filter REGEXP

#### Command

```
show talloc-context (application|global|all) (full|brief|DEPTH) filter REGEXP
```

#### Parameters

##### show

Show running system information

##### talloc-context

Show talloc memory hierarchy

##### application

Application's context

##### global

Global context (OTC\_GLOBAL)

##### all

All contexts, if NULL-context tracking is enabled

##### full

Display a full talloc memory hierarchy

##### brief

Display a brief talloc memory hierarchy

##### DEPTH

Specify required maximal depth value

##### filter

Filter chunks using regular expression

##### REGEXP

Regular expression

### 1.3.69 show talloc-context (application|global|all) (full|brief|DEPTH) tree ADDRESS

#### Command

```
show talloc-context (application|global|all) (full|brief|DEPTH) tree ADDRESS
```

#### Parameters

##### show

Show running system information

##### talloc-context

Show talloc memory hierarchy

##### application

Application's context

global

Global context (OTC\_GLOBAL)

all

All contexts, if NULL-context tracking is enabled

full

Display a full talloc memory hierarchy

brief

Display a brief talloc memory hierarchy

DEPTH

Specify required maximal depth value

tree

Display only a specific memory chunk

ADDRESS

Chunk address (e.g. 0xdeadbeef)

### 1.3.70 show timer [(mgw|hnbgw|pfcf)] [TNNNN]

Command

```
show timer [(mgw|hnbgw|pfcf)] [TNNNN]
```

Parameters

show

Show running system information

timer

Show timers

[mgw]

MGW (Media Gateway) interface

[hnbgw]

Timers

[pfcf]

PFCE timers

[TNNNN]

T- or X-timer-number -- 3GPP compliant timer number of the format '1234' or 'T1234' or 't1234'; Osmocom-specific timer number of the format: 'X1234' or 'x1234'.

### 1.3.71 show version

#### Command

```
show version
```

#### Parameters

##### show

Show running system information

##### version

Displays program version

### 1.3.72 shutdown

#### Command

```
shutdown
```

#### Parameters

##### shutdown

Request a shutdown of the program

### 1.3.73 stats report

#### Command

```
stats report
```

#### Parameters

##### stats

Stats related commands

##### report

Manurally trigger reporting of stats

### 1.3.74 stats reset

#### Command

```
stats reset
```

#### Parameters

##### stats

Stats related commands

##### reset

Reset all rate counter stats

---



### 1.3.75 terminal length <0-512>

#### Command

```
terminal length <0-512>
```

#### Parameters

##### terminal

Set terminal line parameters

##### length

Set number of lines on a screen

##### <0-512>

Number of lines on screen (0 for no pausing)

### 1.3.76 terminal monitor

#### Command

```
terminal monitor
```

#### Parameters

##### terminal

Set terminal line parameters

##### monitor

Copy debug output to the current terminal line

### 1.3.77 terminal no length

#### Command

```
terminal no length
```

#### Parameters

##### terminal

Set terminal line parameters

##### no

Negate a command or set its defaults

##### length

Set number of lines on a screen

---

### 1.3.78 terminal no monitor

#### Command

```
terminal no monitor
```

#### Parameters

##### terminal

Set terminal line parameters

##### no

Negate a command or set its defaults

##### monitor

Copy debug output to the current terminal line

### 1.3.79 who

#### Command

```
who
```

#### Parameters

##### who

Display who is on vty

## 1.4 config

The config node is the root for all configuration commands, which are identical to the config file format. Changes made on the telnet VTY can be made persistent with the 'write file' command.

### 1.4.1 apply sccp

#### Command

```
apply sccp
```

#### Parameters

##### apply

Immediately use configuration modified via telnet VTY, and restart components as needed.

##### sccp

For telnet VTY: apply all SCCP and NRI config changes made to any CN pools and CN links in the running osmo-hnbgw process. If 'remote-addr' changed, related SCCP links will be restarted, possibly dropping active UE contexts. This is run implicitly on program startup, only useful to apply changes made later via telnet VTY.

### 1.4.2 banner motd default

#### Command

```
banner motd default
```

#### Parameters

##### banner

Set banner string

##### motd

Strings for motd

##### default

Default string

### 1.4.3 banner motd file [FILE]

#### Command

```
banner motd file [FILE]
```

#### Parameters

##### banner

Set banner

##### motd

Banner for motd

##### file

Banner from a file

##### [FILE]

Filename

### 1.4.4 cs7 instance <0-15>

#### Command

```
cs7 instance <0-15>
```

#### Global attributes

##### Flag: !

This command applies immediately

#### Parameters

##### cs7

ITU-T Signaling System 7

##### instance

Configure a SS7 Instance

##### <0-15>

An instance of the SS7 stack

### 1.4.5 ctrl

#### Command

```
ctrl
```

#### Parameters

ctrl

Configure the Control Interface

### 1.4.6 enable password (8|) WORD

#### Command

```
enable password (8|) WORD
```

#### Parameters

enable

Modify enable password parameters

password

Assign the privileged level password

8

Specifies a HIDDEN password will follow

dummy string

WORD

The HIDDEN 'enable' password string

### 1.4.7 enable password LINE

#### Command

```
enable password LINE
```

#### Parameters

enable

Modify enable password parameters

password

Assign the privileged level password

LINE

The UNENCRYPTED (cleartext) 'enable' password

---

### 1.4.8 hnbgw

#### Command

```
hnbgw
```

#### Parameters

hnbgw

Configure HNBGW options

### 1.4.9 hostname WORD

#### Command

```
hostname WORD
```

#### Parameters

hostname

Set system's network name

WORD

This system's network name

### 1.4.10 line vty

#### Command

```
line vty
```

#### Parameters

line

Configure a terminal line

vtty

Virtual terminal

### 1.4.11 log alarms <2-32700>

#### Command

```
log alarms <2-32700>
```

#### Parameters

log

Configure logging sub-system

alarms

Logging alarms to osmo\_strrb

<2-32700>

Maximum number of messages to log

---

### 1.4.12 log file FILENAME [blocking-io]

#### Command

```
log file FILENAME [blocking-io]
```

#### Parameters

log

Configure logging sub-system

file

Logging to text file

FILENAME

Filename

[blocking-io]

Use blocking, synchronous I/O

### 1.4.13 log gsmtap [HOSTNAME]

#### Command

```
log gsmtap [HOSTNAME]
```

#### Parameters

log

Configure logging sub-system

gsmtap

Logging via GSMTAP

[HOSTNAME]

Host name to send the GSMTAP logging to (UDP port 4729)

### 1.4.14 log stderr [blocking-io]

#### Command

```
log stderr [blocking-io]
```

#### Parameters

log

Configure logging sub-system

stderr

Logging via STDERR of the process

[blocking-io]

Use blocking, synchronous I/O

---

### 1.4.15 log syslog (authpriv|cron|daemon|ftp|lpr|mail|news|user|uucp)

#### Command

```
log syslog (authpriv|cron|daemon|ftp|lpr|mail|news|user|uucp)
```

#### Parameters

##### log

Configure logging sub-system

##### syslog

Logging via syslog

##### authpriv

Security/authorization messages facility

##### cron

Clock daemon (cron/at) facility

##### daemon

General system daemon facility

##### ftp

Ftp daemon facility

##### lpr

Line printer facility

##### mail

Mail facility

##### news

News facility

##### user

Generic facility

##### uucp

UUCP facility

### 1.4.16 log syslog local <0-7>

#### Command

```
log syslog local <0-7>
```

#### Parameters

##### log

Configure logging sub-system

##### syslog

Logging via syslog

local

Syslog LOCAL facility

<0-7>

Local facility number

### 1.4.17 log systemd-journal [raw]

Command

```
log systemd-journal [raw]
```

Parameters

log

Configure logging sub-system

systemd-journal

Logging to systemd-journal

[raw]

Offload rendering of the meta information (location, category) to systemd

### 1.4.18 msc <0-1000>

Command

```
msc <0-1000>
```

Parameters

msc

Configure an IuCS link to an MSC

<0-1000>

MSC nr

### 1.4.19 no banner motd

Command

```
no banner motd
```

Parameters

no

Negate a command or set its defaults

banner

Set banner string

motd

Strings for motd



### 1.4.20 no enable password

#### Command

```
no enable password
```

#### Parameters

no

Negate a command or set its defaults

enable

Modify enable password parameters

password

Assign the privileged level password

### 1.4.21 no hostname [HOSTNAME]

#### Command

```
no hostname [HOSTNAME]
```

#### Parameters

no

Negate a command or set its defaults

hostname

Reset system's network name

[HOSTNAME]

Host name of this router

### 1.4.22 no log alarms

#### Command

```
no log alarms
```

#### Parameters

no

Negate a command or set its defaults

log

Configure logging sub-system

alarms

Logging alarms to osmo\_strrb

---

### 1.4.23 no log file FILENAME

#### Command

```
no log file FILENAME
```

#### Parameters

no

Negate a command or set its defaults

log

Configure logging sub-system

file

Logging to text file

FILENAME

Filename

### 1.4.24 no log gsmtap [HOSTNAME]

#### Command

```
no log gsmtap [HOSTNAME]
```

#### Parameters

no

Negate a command or set its defaults

log

Configure logging sub-system

gsmtap

Logging via GSMTAP

[HOSTNAME]

Host name to send the GSMTAP logging to (UDP port 4729)

### 1.4.25 no log stderr

#### Command

```
no log stderr
```

#### Parameters

no

Negate a command or set its defaults

log

Configure logging sub-system

stderr

Logging via STDERR of the process

---

### 1.4.26 no log syslog

#### Command

```
no log syslog
```

#### Parameters

no

Negate a command or set its defaults

log

Configure logging sub-system

syslog

Logging via syslog

### 1.4.27 no log systemd-journal

#### Command

```
no log systemd-journal
```

#### Parameters

no

Negate a command or set its defaults

log

Configure logging sub-system

systemd-journal

Logging to systemd-journal

### 1.4.28 no service advanced-vty

#### Command

```
no service advanced-vty
```

#### Parameters

no

Negate a command or set its defaults

service

Set up miscellaneous service

advanced-vty

Enable advanced mode vty interface

---

### 1.4.29 no service terminal-length [<0-512>]

#### Command

```
no service terminal-length [<0-512>]
```

#### Parameters

no

Negate a command or set its defaults

service

Set up miscellaneous service

terminal-length

System wide terminal length configuration

[<0-512>]

Number of lines of VTY (0 means no line control)

### 1.4.30 no stats reporter log [NAME]

#### Command

```
no stats reporter log [NAME]
```

#### Parameters

no

Negate a command or set its defaults

stats

Configure stats sub-system

reporter

Configure a stats reporter

log

Report to the logger

[NAME]

Name of the reporter

### 1.4.31 no stats reporter statsd [NAME]

#### Command

```
no stats reporter statsd [NAME]
```

#### Parameters

---

no

Negate a command or set its defaults

stats

Configure stats sub-system

reporter

Configure a stats reporter

statsd

Report to a STATSD server

[NAME]

Name of the reporter

### 1.4.32 password (8|) WORD

Command

```
password (8|) WORD
```

Parameters

password

Assign the terminal connection password

8

Specifies a HIDDEN password will follow

dummy string

WORD

The HIDDEN line password string

### 1.4.33 password LINE

Command

```
password LINE
```

Parameters

password

Assign the terminal connection password

LINE

The UNENCRYPTED (cleartext) line password

### 1.4.34 service advanced-vty

#### Command

```
service advanced-vty
```

#### Parameters

##### service

Set up miscellaneous service

##### advanced-vty

Enable advanced mode vty interface

### 1.4.35 service terminal-length <0-512>

#### Command

```
service terminal-length <0-512>
```

#### Parameters

##### service

Set up miscellaneous service

##### terminal-length

System wide terminal length configuration

##### <0-512>

Number of lines of VTY (0 means no line control)

### 1.4.36 sgsn <0-1000>

#### Command

```
sgsn <0-1000>
```

#### Parameters

##### sgsn

Configure an IuPS link to an SGSN

##### <0-1000>

SGSN nr

### 1.4.37 show history

#### Command

```
show history
```

#### Parameters

##### show

Show running system information

##### history

Display the session command history

### 1.4.38 stats interval <0-65535>

#### Command

```
stats interval <0-65535>
```

#### Parameters

##### stats

Configure stats sub-system

##### interval

Set the reporting interval

##### <0-65535>

Interval in seconds (0 disables the reporting interval)

### 1.4.39 stats reporter log [NAME]

#### Command

```
stats reporter log [NAME]
```

#### Parameters

##### stats

Configure stats sub-system

##### reporter

Configure a stats reporter

##### log

Report to the logger

##### [NAME]

Name of the reporter

---

#### 1.4.40 stats reporter statsd [NAME]

##### Command

```
stats reporter statsd [NAME]
```

##### Parameters

stats

Configure stats sub-system

reporter

Configure a stats reporter

statsd

Report to a STATSD server

[NAME]

Name of the reporter

#### 1.4.41 stats-tcp batch-size <1-65535>

##### Command

```
stats-tcp batch-size <1-65535>
```

##### Parameters

stats-tcp

Configure stats sub-system

batch-size

Set the number of tcp sockets that are processed per stats polling interval

<1-65535>

Number of sockets per interval

#### 1.4.42 stats-tcp interval <0-65535>

##### Command

```
stats-tcp interval <0-65535>
```

##### Parameters

stats-tcp

Configure stats sub-system

interval

Set the tcp socket stats polling interval

<0-65535>

Interval in seconds (0 disables the polling interval)

---



## 1.5 config-log

The log node is commonly available in all Osmocom programs and allows configuring logging to stderr and/or log files, including logging category and level filtering as well as output formatting options. Note that the 'logging enable' command is required to make logging commands available on the telnet VTY.

### 1.5.1 logging color (0|1)

Command

```
logging color (0|1)
```

Parameters

logging

Configure logging

color

Configure color-printing for log messages

0

Don't use color for printing messages

1

Use color for printing messages

### 1.5.2 logging filter all (0|1)

Disable/enable general log output on a given target. Typically, 'logging filter all 1' allows to see the usual log output on a given target. Setting to '0' can be useful when logging to the telnet VTY console: mute all log output to allow typing VTY commands on the telnet prompt without interference from log output; 'logging filter all 1' then re-enables logging in the same log output configuration as before. Some applications provide more specific filters, e.g. to log a given IMSI only. To employ such filters, set 'logging filter all 0' to disable general logging, and then enable a more specific filter instead.

Command

```
logging filter all (0|1)
```

Parameters

logging

Configure logging

filter

Filter log messages

all

Do you want to log all messages?

0

Only print messages matched by other filters

1

Bypass filter and print all messages

---

### 1.5.3 logging level (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|l...

#### Command

```
logging level (main|hnbap|rua|ranap|mgw|hnb|cn|nft|lglobal|llapd|linp|lmux|lmi|lmib| ↵
lsms|lctrl|lgtp|lstats|lgsup|loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lns| ↵
lbssgp|lndata|lnssignal|liuup|lpfcp|lcsn1|lio) (debug|info|notice|error|fatal)
```

#### Parameters

##### logging

Configure logging

##### level

Set the log level for a specified category

##### main

Main program

##### hnbap

Home Node B Application Part

##### rua

RANAP User Adaptation

##### ranap

RAN Application Part

##### mgw

Media Gateway

##### hnb

HNB side (via RUA)

##### cn

Core Network side (via SCCP)

##### nft

nftables interaction for retrieving stats

##### lglobal

Library-internal global log family

##### llapd

LAPD in libosmogsm

##### linp

A-bis Input Subsystem

##### lmux

A-bis B-Subchannel TRAU Frame Multiplex

##### lmi

A-bis Input Driver for Signalling

---

lmib  
A-bis Input Driver for B-Channels (voice)

lsms  
Layer3 Short Message Service (SMS)

lctrl  
Control Interface

lgtp  
GPRS GTP library

lstats  
Statistics messages and logging

lgsup  
Generic Subscriber Update Protocol

loap  
Osmocom Authentication Protocol

lss7  
libosmo-sigtran Signalling System 7

lsccp  
libosmo-sigtran SCCP Implementation

lsua  
libosmo-sigtran SCCP User Adaptation

lm3ua  
libosmo-sigtran MTP3 User Adaptation

lmgcp  
libosmo-mgcp Media Gateway Control Protocol

ljibuf  
libosmo-netif Jitter Buffer

lrspro  
Remote SIM protocol

lns  
GPRS NS layer

lbssgp  
GPRS BSSGP layer

lnsdata  
GPRS NS layer data PDU

lnsignal  
GPRS NS layer signal PDU

liuup  
Iu UP layer

---

lpfc	libosmo-pfcp Packet Forwarding Control Protocol
lcsn1	libosmo-csn1 Concrete Syntax Notation 1 codec
lio	libosmocore IO Subsystem
debug	Log debug messages and higher levels
info	Log informational messages and higher levels
notice	Log noticeable messages and higher levels
error	Log error messages and higher levels
fatal	Log only fatal messages

#### 1.5.4 logging level force-all (debug|info|notice|error|fatal)

##### Command

```
logging level force-all (debug|info|notice|error|fatal)
```

##### Parameters

##### logging

Configure logging

##### level

Set the log level for a specified category

##### force-all

Globally force all logging categories to a specific level. This is released by the 'no logging level force-all' command. Note: any 'logging level <category> <level>' commands will have no visible effect after this, until the forced level is released.

##### debug

Log debug messages and higher levels

##### info

Log informational messages and higher levels

##### notice

Log noticeable messages and higher levels

##### error

Log error messages and higher levels

##### fatal

Log only fatal messages

### 1.5.5 logging level set-all (debug|info|notice|error|fatal)

#### Command

```
logging level set-all (debug|info|notice|error|fatal)
```

#### Parameters

##### logging

Configure logging

##### level

Set the log level for a specified category

##### set-all

Once-off set all categories to the given log level. There is no single command to take back these changes -- each category is set to the given level, period.

##### debug

Log debug messages and higher levels

##### info

Log informational messages and higher levels

##### notice

Log noticeable messages and higher levels

##### error

Log error messages and higher levels

##### fatal

Log only fatal messages

### 1.5.6 logging print category (0|1)

#### Command

```
logging print category (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### category

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with category/subsystem name

---

### 1.5.7 logging print category-hex (0|1)

#### Command

```
logging print category-hex (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### category-hex

Configure log message

0

Don't prefix each log message

1

Prefix each log message with category/subsystem nr in hex ('<000b>')

### 1.5.8 logging print extended-timestamp (0|1)

#### Command

```
logging print extended-timestamp (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### extended-timestamp

Configure log message timestamping

0

Don't prefix each log message

1

Prefix each log message with current timestamp with YYYYMMDDhhmmssnnn

---

### 1.5.9 logging print file (0|1|basename) [last]

#### Command

```
logging print file (0|1|basename) [last]
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### file

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with the source file and line

##### basename

Prefix each log message with the source file's basename (strip leading paths) and line

##### [last]

Log source file info at the end of a log line. If omitted, log source file info just before the log text.

### 1.5.10 logging print level (0|1)

#### Command

```
logging print level (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### level

Configure log message

##### 0

Don't prefix each log message

##### 1

Prefix each log message with the log level name

### 1.5.11 logging print thread-id (0|1)

#### Command

```
logging print thread-id (0|1)
```

#### Parameters

##### logging

Configure logging

##### print

Log output settings

##### thread-id

Configure log message logging Thread ID

0

Don't prefix each log message

1

Prefix each log message with current Thread ID

### 1.5.12 logging timestamp (0|1)

#### Command

```
logging timestamp (0|1)
```

#### Parameters

##### logging

Configure logging

##### timestamp

Configure log message timestamping

0

Don't prefix each log message

1

Prefix each log message with current timestamp

### 1.5.13 no logging level force-all

#### Command

```
no logging level force-all
```

#### Parameters

---



no

Negate a command or set its defaults

logging

Configure logging

level

Set the log level for a specified category

force-all

Release any globally forced log level set with 'logging level force-all <level>'

## 1.6 config-stats

### 1.6.1 disable

Command

```
disable
```

Parameters

disable

Disable the reporter

### 1.6.2 enable

Command

```
enable
```

Parameters

enable

Enable the reporter

### 1.6.3 flush-period <0-65535>

Command

```
flush-period <0-65535>
```

Parameters

flush-period

Configure stats sub-system

<0-65535>

Send all stats even if they have not changed (i.e. force the flush) every N-th reporting interval. Set to 0 to disable regular flush (default).

### 1.6.4 level (global|peer|subscriber)

#### Command

```
level (global|peer|subscriber)
```

#### Parameters

##### level

Set the maximum group level

##### global

Report global groups only

##### peer

Report global and network peer related groups

##### subscriber

Report global, peer, and subscriber groups

### 1.6.5 local-ip ADDR

#### Command

```
local-ip ADDR
```

#### Parameters

##### local-ip

Set the IP address to which we bind locally

##### ADDR

IP Address

### 1.6.6 mtu <100-65535>

#### Command

```
mtu <100-65535>
```

#### Parameters

##### mtu

Set the maximum packet size

##### <100-65535>

Size in byte

---

### 1.6.7 no local-ip

#### Command

```
no local-ip
```

#### Parameters

no

Negate a command or set its defaults

local-ip

Set the IP address to which we bind locally

### 1.6.8 no mtu

#### Command

```
no mtu
```

#### Parameters

no

Negate a command or set its defaults

mtu

Set the maximum packet size

### 1.6.9 no prefix

#### Command

```
no prefix
```

#### Parameters

no

Negate a command or set its defaults

prefix

Set the item name prefix

### 1.6.10 prefix PREFIX

#### Command

```
prefix PREFIX
```

#### Parameters

prefix

Set the item name prefix

PREFIX

The prefix string

---

### 1.6.11 remote-ip ADDR

#### Command

```
remote-ip ADDR
```

#### Parameters

##### remote-ip

Set the remote IP address to which we connect

##### ADDR

IP Address

### 1.6.12 remote-port <1-65535>

#### Command

```
remote-port <1-65535>
```

#### Parameters

##### remote-port

Set the remote port to which we connect

##### <1-65535>

Remote port number

## 1.7 config-line

### 1.7.1 bind A.B.C.D [<0-65535>]

#### Command

```
bind A.B.C.D [<0-65535>]
```

#### Parameters

##### bind

Accept VTY telnet connections on local interface

##### A.B.C.D

Local interface IP address (default: 127.0.0.1)

##### [<0-65535>]

Local TCP port number

---

### 1.7.2 login

#### Command

```
login
```

#### Parameters

login

Enable password checking

### 1.7.3 no login

#### Command

```
no login
```

#### Parameters

no

Negate a command or set its defaults

login

Enable password checking

## 1.8 config-ctrl

### 1.8.1 bind A.B.C.D [<0-65535>]

#### Command

```
bind A.B.C.D [<0-65535>]
```

#### Parameters

bind

Set bind address to listen for Control connections

A.B.C.D

Local IP address (default 127.0.0.1)

[<0-65535>]

Local TCP port number

---

## 1.9 config-cs7

### 1.9.1 as NAME (sua|m3ua|ipa)

#### Command

```
as NAME (sua|m3ua|ipa)
```

#### Global attributes

#### Flag: !

This command applies immediately

#### Parameters

as

Configure an Application Server

NAME

Name of the Application Server

sua

SCCP User Adaptation

m3ua

MTP3 User Adaptation

ipa

IPA Multiplex (SCCP Lite)

### 1.9.2 asp NAME <0-65535> <0-65535> (sua|m3ua|ipa)

#### Command

```
asp NAME <0-65535> <0-65535> (sua|m3ua|ipa)
```

#### Global attributes

#### Flag: @

This command applies on VTY node exit

#### Parameters

asp

Configure Application Server Process

NAME

Name of ASP

<0-65535>

Remote port number

<0-65535>

Local port number

sua

SCCP User Adaptation

m3ua

MTP3 User Adaptation

ipa

IPA Multiplex (SCCP Lite)

### 1.9.3 asp NAME <0-65535> <0-65535> (sua|m3ua|ipa) (sctp|tcp)

Command

```
asp NAME <0-65535> <0-65535> (sua|m3ua|ipa) (sctp|tcp)
```

Global attributes

Flag: @

This command applies on VTY node exit

Parameters

asp

Configure Application Server Process

NAME

Name of ASP

<0-65535>

Remote port number

<0-65535>

Local port number

sua

SCCP User Adaptation

m3ua

MTP3 User Adaptation

ipa

IPA Multiplex (SCCP Lite)

sctp

SCTP (Stream Control Transmission Protocol)

tcp

TCP (Transmission Control Protocol)

### 1.9.4 description .TEXT

#### Command

```
description .TEXT
```

#### Parameters

##### description

Save human-readable description of the object

##### .TEXT

Text until the end of the line

### 1.9.5 network-indicator (international | national | reserved | spare)

#### Command

```
network-indicator (international | national | reserved | spare)
```

#### Global attributes

##### Flag: !

This command applies immediately

#### Parameters

##### network-indicator

Configure the Network Indicator

##### international

International Network

##### national

National Network

##### reserved

Reserved Network

##### spare

Spare Network

### 1.9.6 no as NAME

#### Command

```
no as NAME
```

#### Global attributes

---



Flag: !

This command applies immediately

Parameters

no

Negate a command or set its defaults

as

Disable Application Server

NAME

Name of AS

### 1.9.7 no asp NAME

Command

```
no asp NAME
```

Global attributes

Flag: !

This command applies immediately

Parameters

no

Negate a command or set its defaults

asp

Disable Application Server Process

NAME

Name of ASP

### 1.9.8 no sccp-address NAME

Command

```
no sccp-address NAME
```

Global attributes

Flag: !

This command applies immediately

Parameters

no

Negate a command or set its defaults

sccp-address

Delete an SCCP addressbook entry

NAME

Name of the SCCP Address

### 1.9.9 point-code POINT\_CODE

#### Command

```
point-code POINT_CODE
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

point-code

Configure the local Point Code

POINT\_CODE

Point Code

### 1.9.10 point-code delimiter (default|dash)

#### Command

```
point-code delimiter (default|dash)
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

point-code

Point Code

delimiter

Configure Point Code Delimiter

default

Use dot as delimiter

dash

User dash as delimiter

### 1.9.11 point-code format <1-24> [<1-23>] [<1-22>]

#### Command

```
point-code format <1-24> [<1-23>] [<1-22>]
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

point-code

Point Code

format

Configure Point Code Format

<1-24>

Length of first PC component

[<1-23>]

Length of second PC component

[<1-22>]

Length of third PC component

### 1.9.12 point-code format default

#### Command

```
point-code format default
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

point-code

Point Code

format

Configure Point Code Format

default

Default Point Code Format (3.8.3)

---

### 1.9.13 sccp max-optional-data (<0-999999>|standard)

#### Command

```
sccp max-optional-data (<0-999999>|standard)
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

sccp

Configure SCCP behavior

max-optional-data

Adjust the upper bound for the optional data length (the payload) for CR, CC, CREF and RLSD messages. For any Optional Data part larger than this value in octets, send CR, CC, CREF and RLSD messages without any payload, and send the data payload in a separate Data Form 1 message. ITU-T Q.713 sections 4.2 thru 4.5 define a limit of 130 bytes for the 'Data' parameter. This limit can be adjusted here. May be useful for interop with nonstandard SCCP peers.

<0-999999>

Set a non-standard maximum allowed number of bytes

standard

Use the ITU-T Q.713 4.2 to 4.5 standard value of 130

### 1.9.14 sccp-address NAME

#### Command

```
sccp-address NAME
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

sccp-address

Create/Modify an SCCP addressbook entry

NAME

Name of the SCCP Address

---

### 1.9.15 sccp-timer (conn\_est|ias|iar|rel|repeat\_rel|int|guard|reset|reassembly) <1-99999...

#### Command

```
sccp-timer (conn_est|ias|iar|rel|repeat_rel|int|guard|reset|reassembly) <1-999999>
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

##### sccp-timer

Configure SCCP timer values, see ITU-T Q.714

##### conn\_est

Waiting for connection confirm message, 1 to 2 minutes (default: 60)

##### ias

Send keep-alive: on an idle connection, delay before sending an Idle Timer message, 5 to 10 minutes (default: 420)

##### iar

Receive keep-alive: on an idle connection, delay until considering a connection as stale, 11 to 21 minutes (default: 900)

##### rel

Waiting for release complete message, 10 to 20 seconds (default: 10)

##### repeat\_rel

Waiting for release complete message; or to repeat sending released message after the initial expiry, 10 to 20 seconds (default: 10)

##### int

Waiting for release complete message; or to release connection resources, freeze the LRN and alert a maintenance function after the initial expiry, extending to 1 minute (default: 60)

##### guard

Waiting to resume normal procedure for temporary connection sections during the restart procedure, 23 to 25 minutes (default: 1380)

##### reset

Waiting to release temporary connection section or alert maintenance function after reset request message is sent, 10 to 20 seconds (default: 10)

##### reassembly

Waiting to receive all the segments of the remaining segments, single segmented message after receiving the first segment, 10 to 20 seconds (default: 10)

##### <1-999999>

Timer value, in seconds

---

### 1.9.16 secondary-pc POINT\_CODE

Command

```
secondary-pc POINT_CODE
```

Global attributes

Flag: !

This command applies immediately

Parameters

secondary-pc

Configure the local Secondary Point Code

POINT\_CODE

Point Code

### 1.9.17 sls-opc-dpc [opc-shift] [<0-8>] [dpc-shift] [<0-8>]

Command

```
sls-opc-dpc [opc-shift] [<0-8>] [dpc-shift] [<0-8>]
```

Global attributes

Flag: !

This command applies immediately

Parameters

sls-opc-dpc

Shift OPC and DPC bits used during routing decision

[opc-shift]

Shift OPC bits used during routing decision

[<0-8>]

How many bits from ITU OPC field (starting from least-significant-bit) to skip (default=0). 6 bits are always used

[dpc-shift]

Shift DPC bits used during routing decision

[<0-8>]

How many bits from ITU DPC field (starting from least-significant-bit) to skip (default=0). 6 bits are always used

### 1.9.18 sls-shift <0-6>

#### Command

```
sls-shift <0-6>
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

sls-shift

Shift SLS bits used during routing decision

<0-6>

How many bits from derivated 7-bit extended-SLS (OPC, DPC, SLS) field (starting from least-significant-bit) to skip

### 1.9.19 xua rkm routing-key-allocation (static-only|dynamic-permitted)

#### Command

```
xua rkm routing-key-allocation (static-only|dynamic-permitted)
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

xua

SIGTRAN xxxUA related

rkm

Routing Key Management

routing-key-allocation

Routing Key Management Allocation Policy

static-only

Only static (pre-configured) Routing Keys permitted

dynamic-permitted

Dynamically allocate Routing Keys for what ASPs request

---

## 1.10 config-cs7-as

### 1.10.1 asp NAME

Command

```
asp NAME
```

Global attributes

Flag: !

This command applies immediately

Parameters

asp

Specify that a given ASP is part of this AS

NAME

Name of ASP to be added to AS

### 1.10.2 description .TEXT

Command

```
description .TEXT
```

Parameters

description

Save human-readable description of the object

.TEXT

Text until the end of the line

### 1.10.3 no asp NAME

Command

```
no asp NAME
```

Global attributes

Flag: !

This command applies immediately

Parameters

no

Negate a command or set its defaults

asp

Specify ASP to be removed from this AS

NAME

Name of ASP to be removed



### 1.10.4 no traffic-mode

#### Command

```
no traffic-mode
```

#### Parameters

no

Negate a command or set its defaults

traffic-mode

Remove explicit traffic mode of operation of this AS

### 1.10.5 point-code override dpc PC

#### Command

```
point-code override dpc PC
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

point-code

Point Code Specific Features

override

Override (force) a point-code to hard-coded value

dpc

Override Source Point Code

PC

Override Destination Point Code

### 1.10.6 point-code override patch-sccp (disabled|both)

#### Command

```
point-code override patch-sccp (disabled|both)
```

#### Global attributes

Flag: !

This command applies immediately

---

#### Parameters

##### point-code

Point Code Specific Features

##### override

Override (force) a point-code to hard-coded value

##### patch-sccp

Patch point code values into SCCP called/calling address

##### disabled

Don't patch any point codes into SCCP called/calling address

##### both

Patch both origin and destination point codes into SCCP called/calling address

### 1.10.7 qos-class <0-7>

#### Command

```
qos-class <0-7>
```

#### Global attributes

##### Flag: !

This command applies immediately

#### Parameters

##### qos-class

Specity QoS Class of AS

##### <0-7>

QoS Class

### 1.10.8 recovery-timeout <1-2000>

#### Command

```
recovery-timeout <1-2000>
```

#### Global attributes

##### Flag: !

This command applies immediately

#### Parameters

##### recovery-timeout

Specifies the recovery timeout value in milliseconds

##### <1-2000>

Recovery Timeout in Milliseconds

---

### 1.10.9 routing-key RCONTEXT DPC

#### Command

```
routing-key RCONTEXT DPC
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

##### routing-key

Define a routing key

##### RCONTEXT

Routing context number

##### DPC

Destination Point Code

### 1.10.10 routing-key RCONTEXT DPC si (aal2|bicc|b-isup|h248|isup|sat-isup|sccp|tup)

#### Command

```
routing-key RCONTEXT DPC si (aal2|bicc|b-isup|h248|isup|sat-isup|sccp|tup)
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

##### routing-key

Define a routing key

##### RCONTEXT

Routing context number

##### DPC

Destination Point Code

##### si

Match on Service Indicator

##### aal2

ATM Adaption Layer 2

##### bicc

Bearer Independent Call Control

b-isup

Broadband ISDN User Part

h248

H.248

isup

ISDN User Part

sat-isup

Sattelite ISDN User Part

sccp

Signalling Connection Control Part

tup

Telephony User Part

### 1.10.11 routing-key RCONTEXT DPC si (aal2|bicc|b-isup|h248|isup|sat-isup|sccp|tup) ssn S...

Command

```
routing-key RCONTEXT DPC si (aal2|bicc|b-isup|h248|isup|sat-isup|sccp|tup) ssn SSN
```

Global attributes

Flag: !

This command applies immediately

Parameters

routing-key

Define a routing key

RCONTEXT

Routing context number

DPC

Destination Point Code

si

Match on Service Indicator

aal2

ATM Adaption Layer 2

bicc

Bearer Independent Call Control

b-isup

Broadband ISDN User Part

h248

H.248

isup

ISDN User Part

sat-isup

Sattelite ISDN User Part

sccp

Signalling Connection Control Part

tup

Telephony User Part

ssn

Match on Sub-System Number

SSN

Sub-System Number to match on

### 1.10.12 routing-key RCONTEXT DPC ssn SSN

Command

```
routing-key RCONTEXT DPC ssn SSN
```

Global attributes

Flag: !

This command applies immediately

Parameters

routing-key

Define a routing key

RCONTEXT

Routing context number

DPC

Destination Point Code

ssn

Match on Sub-System Number

SSN

Sub-System Number to match on

### 1.10.13 sls-shift <0-3>

#### Command

```
sls-shift <0-3>
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

##### sls-shift

Shift SLS bits used during routing decision

##### <0-3>

How many bits from SLS field (starting from least-significant-bit) to skip

### 1.10.14 traffic-mode (broadcast | roundrobin | override)

#### Command

```
traffic-mode (broadcast | roundrobin | override)
```

#### Parameters

##### traffic-mode

Specifies traffic mode of operation of the ASP within the AS

##### broadcast

Broadcast to all ASP within AS

##### roundrobin

Round-Robin between all ASP within AS

##### override

Override

### 1.10.15 traffic-mode loadshare [bindings] [sls] [opc-sls] [opc-shift] [<0-2>]

#### Command

```
traffic-mode loadshare [bindings] [sls] [opc-sls] [opc-shift] [<0-2>]
```

#### Parameters

##### traffic-mode

Specifies traffic mode of operation of the ASP within the AS

---

**loadshare**

Share Load among all ASP within AS

**[bindings]**

Configure Loadshare parameters

**[sls]**

Configure Loadshare SLS generation parameters

**[opc-sls]**

Generate extended SLS with OPC information

**[opc-shift]**

Shift OPC bits used during routing decision

**[<0-2>]**

How many bits from ITU OPC field (starting from least-significant-bit) to skip (default=0). 6 bits are always used

## 1.11 config-cs7-asp

### 1.11.1 block

**Command**

```
block
```

**Global attributes**

Flag: @

This command applies on VTY node exit

**Parameters****block**

Allows a SCTP Association with ASP, but doesn't let it become active

### 1.11.2 description .TEXT

**Command**

```
description .TEXT
```

**Parameters****description**

Save human-readable description of the object

**.TEXT**

Text until the end of the line

### 1.11.3 local-ip (A.B.C.D|X:X::X:X) [primary]

#### Command

```
local-ip (A.B.C.D|X:X::X:X) [primary]
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

local-ip

Specify Local IP Address from which to contact ASP

A.B.C.D

Local IPv4 Address from which to contact of ASP

X:X::X:X

Local IPv6 Address from which to contact of ASP

[primary]

Signal the SCTP peer to use this address as Primary Address

### 1.11.4 no local-ip (A.B.C.D|X:X::X:X)

#### Command

```
no local-ip (A.B.C.D|X:X::X:X)
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

no

Negate a command or set its defaults

local-ip

Specify Local IP Address from which to contact ASP

A.B.C.D

Local IPv4 Address from which to contact of ASP

X:X::X:X

Local IPv6 Address from which to contact of ASP



### 1.11.5 no quirk (no\_notify|daud\_in\_asp|snm\_inactive)

#### Command

```
no quirk (no_notify|daud_in_asp|snm_inactive)
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

no

Negate a command or set its defaults

quirk

Disable quirk to work around interop issues

no\_notify

Peer SG doesn't send NTFY(AS-INACTIVE) after ASP-UP

daud\_in\_asp

Allow Rx of DAUD in ASP role

snm\_inactive

Allow Rx of [S]SNM in AS-INACTIVE state

### 1.11.6 no remote-ip (A.B.C.D|X:X::X:X)

#### Command

```
no remote-ip (A.B.C.D|X:X::X:X)
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

no

Negate a command or set its defaults

remote-ip

Specify Remote IP Address of ASP

A.B.C.D

Remote IPv4 Address of ASP

X:X::X:X

Remote IPv6 Address of ASP

### 1.11.7 no sctp-param init (num-ostreams|max-instreams|max-attempts|timeout)

#### Command

```
no sctp-param init (num-ostreams|max-instreams|max-attempts|timeout)
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

no

Negate a command or set its defaults

sctp-param

Configure SCTP parameters

init

Configure INIT related parameters

num-ostreams

Configure INIT Number of Outbound Streams

max-instreams

Configure INIT Maximum Inboud Streams

max-attempts

Configure INIT Maximum Attempts

timeout

Configure INIT Timeout (milliseconds)

### 1.11.8 qos-class <0-7>

#### Command

```
qos-class <0-7>
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

qos-class

Specify QoS Class of ASP

<0-7>

QoS Class

---

### 1.11.9 quirk (no\_notify|daud\_in\_asp|snm\_inactive)

#### Command

```
quirk (no_notify|daud_in_asp|snm_inactive)
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

##### quirk

Enable quirk to work around interop issues

##### no\_notify

Peer SG doesn't send NTFY(AS-INACTIVE) after ASP-UP

##### daud\_in\_asp

Allow Rx of DAUD in ASP role

##### snm\_inactive

Allow Rx of [S]SNM in AS-INACTIVE state

### 1.11.10 remote-ip (A.B.C.D|X:X::X:X) [primary]

#### Command

```
remote-ip (A.B.C.D|X:X::X:X) [primary]
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

##### remote-ip

Specify Remote IP Address of ASP

##### A.B.C.D

Remote IPv4 Address of ASP

##### X:X::X:X

Remote IPv6 Address of ASP

##### [primary]

Set remote address as SCTP Primary Address

---

### 1.11.11 role (sg|asp|ipsp)

#### Command

```
role (sg|asp|ipsp)
```

#### Global attributes

#### Flag: @

This command applies on VTY node exit

#### Parameters

##### role

Specify the xUA role for this ASP

##### sg

SG (Signaling Gateway)

##### asp

ASP (Application Server Process)

##### ipsp

IPSP (IP Signalling Point)

### 1.11.12 sctp-param init (num-ostreams|max-instreams|max-attempts|timeout) <0-65535>

#### Command

```
sctp-param init (num-ostreams|max-instreams|max-attempts|timeout) <0-65535>
```

#### Global attributes

#### Flag: @

This command applies on VTY node exit

#### Parameters

##### sctp-param

Configure SCTP parameters

##### init

Configure INIT related parameters

##### num-ostreams

Configure INIT Number of Outbound Streams

##### max-instreams

Configure INIT Maximum Inboud Streams

##### max-attempts

Configure INIT Maximum Attempts

##### timeout

Configure INIT Timeout (milliseconds)

##### <0-65535>

Value of the parameter

---

### 1.11.13 shutdown

#### Command

```
shutdown
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

shutdown

Terminates SCTP association; New associations will be rejected

### 1.11.14 timer lm (wait\_asp\_up|wait\_notify|wait\_notify\_rkm|wait\_rk\_reg\_resp) <1-999999>

#### Command

```
timer lm (wait_asp_up|wait_notify|wait_notify_rkm|wait_rk_reg_resp) <1-999999>
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

timer

Configure ASP default timer values

lm

Configure ASP default lm timer values

wait\_asp\_up

Restart ASP after timeout waiting for ASP UP (SG role) / ASP UP ACK (ASP role) (s) (default: 20)

wait\_notify

Restart ASP after timeout waiting for NOTIFY (s) (default: 2)

wait\_notify\_rkm

Restart ASP after timeout waiting for NOTIFY after RKM registration (s) (default: 20)

wait\_rk\_reg\_resp

Restart ASP after timeout waiting for RK\_REG\_RESP (s) (default: 10)

<1-999999>

Timer value, in seconds

### 1.11.15 transport-role (client|server)

#### Command

```
transport-role (client|server)
```

#### Global attributes

Flag: @

This command applies on VTY node exit

#### Parameters

##### transport-role

Specify the transport layer role for this ASP

##### client

Operate as a client; connect to a server

##### server

Operate as a server; wait for client connections

## 1.12 config-cs7-sccpaddr

### 1.12.1 global-title

#### Command

```
global-title
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

##### global-title

Add/Modify Global Title

### 1.12.2 no global-title

#### Command

```
no global-title
```

#### Global attributes

---

Flag: !

This command applies immediately

Parameters

no

Negate a command or set its defaults

global-title

Remove Global Title

### 1.12.3 no point-code

Command

```
no point-code
```

Global attributes

Flag: !

This command applies immediately

Parameters

no

Negate a command or set its defaults

point-code

Remove point-code Number

### 1.12.4 no subsystem-number

Command

```
no subsystem-number
```

Global attributes

Flag: !

This command applies immediately

Parameters

no

Negate a command or set its defaults

subsystem-number

Remove Subsystem Number

### 1.12.5 point-code POINT\_CODE

#### Command

```
point-code POINT_CODE
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

point-code

Add point-code Number

POINT\_CODE

PC

### 1.12.6 routing-indicator (GT|PC|IP)

#### Command

```
routing-indicator (GT|PC|IP)
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

routing-indicator

Add Routing Indicator

GT

by global-title

PC

by point-code

IP

by ip-address



### 1.12.7 subsystem-number <0-4294967295>

#### Command

```
subsystem-number <0-4294967295>
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

subsystem-number

Add Subsystem Number

<0-4294967295>

SSN

## 1.13 config-cs7-sccpaddr-gt

### 1.13.1 digits DIGITS

#### Command

```
digits DIGITS
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

digits

Set Global Title Digits

DIGITS

Number digits

### 1.13.2 global-title-indicator <0-15>

#### Command

```
global-title-indicator <0-15>
```

#### Global attributes

---

Flag: !

This command applies immediately

Parameters

global-title-indicator

Set Global Title Indicator

<0-15>

GTI

### 1.13.3 nature-of-address-indicator <0-127>

Command

```
nature-of-address-indicator <0-127>
```

Global attributes

Flag: !

This command applies immediately

Parameters

nature-of-address-indicator

Set Global Title Nature of Address Indicator

<0-127>

NAI

### 1.13.4 numbering-plan-indicator <0-15>

Command

```
numbering-plan-indicator <0-15>
```

Global attributes

Flag: !

This command applies immediately

Parameters

numbering-plan-indicator

Set Global Title Numbering Plan Indicator

<0-15>

NPI

### 1.13.5 translation-type <0-255>

#### Command

```
translation-type <0-255>
```

#### Global attributes

#### Flag: !

This command applies immediately

#### Parameters

#### translation-type

Set Global Title Translation Type

#### <0-255>

TT

## 1.14 config-hnbgw

### 1.14.1 hnb UMTS\_CELL\_ID

#### Command

```
hnb UMTS_CELL_ID
```

#### Parameters

#### hnb

hNodeB specific configuration

#### UMTS\_CELL\_ID

Identity of hNodeB in xxx-yyy-Llac-Rrac-Ssac-Ccid format

### 1.14.2 hnb-policy (accept-all|closed)

#### Command

```
hnb-policy (accept-all|closed)
```

#### Parameters

#### hnb-policy

Configure the policy of which HNB connections to accept

#### accept-all

Accept HNB of any identity

#### closed

Accept only HNB whose identity is explicitly configured via VTY

---

### 1.14.3 iucs

#### Command

```
iucs
```

#### Parameters

iucs

Configure IuCS options

### 1.14.4 iuh

#### Command

```
iuh
```

#### Parameters

iuh

Configure Iuh options

### 1.14.5 iups

#### Command

```
iups
```

#### Parameters

iups

Configure IuPS options

### 1.14.6 log-prefix (hnb-id|umts-cell-id)

#### Command

```
log-prefix (hnb-id|umts-cell-id)
```

#### Parameters

log-prefix

Configure the log message prefix

hnb-id

Use the hNB-ID as log message prefix

umts-cell-id

Use the UMTS Cell ID as log message prefix

---

### 1.14.7 mgcp

#### Command

```
mgcp
```

#### Parameters

mgcp

Configure MGCP client

### 1.14.8 mgw <0-255>

#### Command

```
mgw <0-255>
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

mgw

Select a MGCP client config to setup

<0-255>

reference number

### 1.14.9 nft-kpi [TABLE\_NAME]

#### Command

```
nft-kpi [TABLE_NAME]
```

#### Parameters

nft-kpi

Retrieve traffic counters from nftables

[TABLE\_NAME]

Set a custom nft table name to use, instead of 'osmo-hnbgw'

---

### 1.14.10 no hnb IDENTITY\_INFO

#### Command

```
no hnb IDENTITY_INFO
```

#### Parameters

no

Negate a command or set its defaults

hnb

Remove configuration for specified hNodeB

IDENTITY\_INFO

Identity of hNodeB

### 1.14.11 no mgw <0-255>

#### Command

```
no mgw <0-255>
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

no

Negate a command or set its defaults

mgw

Select a MGCP client config to remove

<0-255>

reference number

### 1.14.12 no nft-kpi

#### Command

```
no nft-kpi
```

#### Parameters

no

Negate a command or set its defaults

nft-kpi

Retrieve traffic counters from nftables

---

### 1.14.13 pfcf

Command

```
pfcf
```

Parameters

pfcf

Configure PFCF for GTP tunnel mapping

### 1.14.14 plmn <1-999> <0-999>

Command

```
plmn <1-999> <0-999>
```

Parameters

plmn

Configure the HNBGW's PLMN. The PLMN is transmitted in RANAP RESET towards the CN.

<1-999>

MCC, Mobile Country Code

<0-999>

MNC, Mobile Network Code

### 1.14.15 rnc-id <0-65535>

Command

```
rnc-id <0-65535>
```

Parameters

rnc-id

Configure the HNBGW's RNC Id, the common RNC Id used for all connected hNodeB. It is sent to each hNodeB upon HNBAP HNB-Register-Accept, and the hNodeB will subsequently send this as RANAP InitialUE Messages' GlobalRNC-ID IE. Takes effect as soon as the hNodeB re-registers.

<0-65535>

RNC Id value

### 1.14.16 timer [(mgw|hnbgw|pfcf)] [TNNNN] [<0-2147483647>|default]

#### Command

```
timer [(mgw|hnbgw|pfcf)] [TNNNN] [<0-2147483647>|default]
```

#### Parameters

##### timer

Configure or show timers

##### [mgw]

MGW (Media Gateway) interface

##### [hnbgw]

Timers

##### [pfcf]

PCFP timers

##### [TNNNN]

T- or X-timer-number -- 3GPP compliant timer number of the format '1234' or 'T1234' or 't1234'; Osmocom-specific timer number of the format: 'X1234' or 'x1234'.

##### [<0-2147483647>]

New timer value

##### [default]

Set to default timer value

## 1.15 config-hnbgw-hnb

## 1.16 config-hnbgw-iuh

### 1.16.1 hnbap-allow-tmsi (0|1)

#### Command

```
hnbap-allow-tmsi (0|1)
```

#### Parameters

##### hnbap-allow-tmsi

Allow HNBAP UE Register messages with TMSI or PTMSI identity

##### 0

Only accept IMSI identity, reject TMSI or PTMSI

##### 1

Accept IMSI, TMSI or PTMSI as UE identity



## 1.16.2 local-ip A.B.C.D

### Command

```
local-ip A.B.C.D
```

### Parameters

#### local-ip

Accept Iuh connections on local interface

#### A.B.C.D

Local interface IP address (default: 0.0.0.0)

## 1.16.3 local-port <1-65535>

### Command

```
local-port <1-65535>
```

### Parameters

#### local-port

Accept Iuh connections on local port

#### <1-65535>

Local interface port (default: 29169)

## 1.17 config-hnbgw-iucs

### 1.17.1 nri bitlen <1-15>

### Command

```
nri bitlen <1-15>
```

### Parameters

#### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

#### bitlen

Set number of bits that an NRI has, to extract from TMSI identities (always starting just after the TMSI's most significant octet).

#### <1-15>

bit count (default: 10)

---

### 1.17.2 nri null add <0-32767> [<0-32767>]

#### Command

```
nri null add <0-32767> [<0-32767>]
```

#### Parameters

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

##### null

Define NULL-NRI values that cause re-assignment of an MS to a different CN peer, for CN pooling.

##### add

Add NULL-NRI value (or range)

##### <0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

##### [<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

### 1.17.3 nri null del <0-32767> [<0-32767>]

#### Command

```
nri null del <0-32767> [<0-32767>]
```

#### Parameters

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

##### null

Define NULL-NRI values that cause re-assignment of an MS to a different CN peer, for CN pooling.

##### del

Remove NRI value or range from the NRI mapping for this CN link

##### <0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

##### [<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

---

## 1.18 config-hnbgw-iups

### 1.18.1 nri bitlen <1-15>

#### Command

```
nri bitlen <1-15>
```

#### Parameters

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

##### bitlen

Set number of bits that an NRI has, to extract from TMSI identities (always starting just after the TMSI's most significant octet).

##### <1-15>

bit count (default: 10)

### 1.18.2 nri null add <0-32767> [<0-32767>]

#### Command

```
nri null add <0-32767> [<0-32767>]
```

#### Parameters

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

##### null

Define NULL-NRI values that cause re-assignment of an MS to a different CN peer, for CN pooling.

##### add

Add NULL-NRI value (or range)

##### <0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

##### [<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

---

### 1.18.3 nri null del <0-32767> [<0-32767>]

#### Command

```
nri null del <0-32767> [<0-32767>]
```

#### Parameters

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

##### null

Define NULL-NRI values that cause re-assignment of an MS to a different CN peer, for CN pooling.

##### del

Remove NRI value or range from the NRI mapping for this CN link

##### <0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

##### [<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

## 1.19 config-hnbgw-mgcp

### 1.19.1 keepalive request-endpoint NAME

#### Command

```
keepalive request-endpoint NAME
```

#### Parameters

##### keepalive

Monitor if the MGCP link against MGW is still usable

##### request-endpoint

Use a given endpoint name when sending an MGCP command to the MGW for keepalive purposes

##### NAME

The name of the endpoint to use

---

### 1.19.2 keepalive request-interval <0-4294967295>

#### Command

```
keepalive request-interval <0-4294967295>
```

#### Parameters

##### keepalive

Monitor if the MGCP link against MGW is still usable

##### request-interval

Send an MGCP command to the MGW at given interval if no other commands are sent

<0-4294967295>

The interval at which send MGCP commands (s), 0 to disable

### 1.19.3 keepalive timeout <0-4294967295>

#### Command

```
keepalive timeout <0-4294967295>
```

#### Parameters

##### keepalive

Monitor if the MGCP link against MGW is still usable

##### timeout

Consider the link to the MGW to be down after time without receiving any message from it

<0-4294967295>

The timeout (s), 0 to disable

## 1.20 config-mgw

### 1.20.1 description .TEXT

#### Command

```
description .TEXT
```

#### Parameters

##### description

Save human-readable description of the object

##### .TEXT

Text until the end of the line

---

### 1.20.2 endpoint-domain NAME

#### Command

```
endpoint-domain NAME
```

#### Parameters

##### endpoint-domain

Set the domain name to send in MGCP messages, e.g. the part 'foo' in 'rtpbridge/\*@foo'.

##### NAME

Domain name, should be alphanumeric.

### 1.20.3 keepalive request-endpoint NAME

#### Command

```
keepalive request-endpoint NAME
```

#### Parameters

##### keepalive

Monitor if the MGCP link against MGW is still usable

##### request-endpoint

Use a given endpoint name when sending an MGCP command to the MGW for keepalive purposes

##### NAME

The name of the endpoint to use

### 1.20.4 keepalive request-interval <0-4294967295>

#### Command

```
keepalive request-interval <0-4294967295>
```

#### Parameters

##### keepalive

Monitor if the MGCP link against MGW is still usable

##### request-interval

Send an MGCP command to the MGW at given interval if no other commands are sent

##### <0-4294967295>

The interval at which send MGCP commands (s), 0 to disable

---

### 1.20.5 **keepalive timeout <0-4294967295>**

#### Command

```
keepalive timeout <0-4294967295>
```

#### Parameters

##### keepalive

Monitor if the MGCP link against MGW is still usable

##### timeout

Consider the link to the MGW to be down after time without receiving any message from it

<0-4294967295>

The timeout (s), 0 to disable

### 1.20.6 **local-ip (A.B.C.D|X:X::X:X)**

#### Command

```
local-ip (A.B.C.D|X:X::X:X)
```

#### Parameters

##### local-ip

local bind to connect to MGW from

##### A.B.C.D

local bind IPv4 address

##### X:X::X:X

local bind IPv6 address

### 1.20.7 **local-port <0-65535>**

#### Command

```
local-port <0-65535>
```

#### Parameters

##### local-port

local port to connect to MGW from

<0-65535>

local bind port

---

### 1.20.8 no reset-endpoint NAME

#### Command

```
no reset-endpoint NAME
```

#### Parameters

no

Negate a command or set its defaults

reset-endpoint

remove an endpoint name from the reset-endpoint list, e.g. 'rtpbridge/\*'

NAME

Endpoint name, e.g. 'rtpbridge/\*' or 'ds/e1-0/s-3/su16-4'.

### 1.20.9 remote-ip (A.B.C.D|X:X::X:X)

#### Command

```
remote-ip (A.B.C.D|X:X::X:X)
```

#### Parameters

remote-ip

remote IP address to reach the MGW at

A.B.C.D

remote IPv4 address

X:X::X:X

remote IPv6 address

### 1.20.10 remote-port <0-65535>

#### Command

```
remote-port <0-65535>
```

#### Parameters

remote-port

remote port to reach the MGW at

<0-65535>

remote port

---



## 1.20.11 reset-endpoint NAME

### Command

```
reset-endpoint NAME
```

### Parameters

#### reset-endpoint

Add an endpoint name that should be reset (DLCX) on connect to the reset-endpoint list, e.g. 'rtpbridge/\*'

#### NAME

Endpoint name, e.g. 'rtpbridge/\*' or 'ds/e1-0/s-3/su16-4'.

## 1.21 config-hnbgw-pfcp

### 1.21.1 local-addr IP\_ADDR

#### Command

```
local-addr IP_ADDR
```

### Parameters

#### local-addr

Local address for PFCP

#### IP\_ADDR

IP address

### 1.21.2 local-port <1-65535>

#### Command

```
local-port <1-65535>
```

### Parameters

#### local-port

Local port for PFCP

#### <1-65535>

UDP port

---

### 1.21.3 netinst (access|core) NAME

#### Command

```
netinst (access|core) NAME
```

#### Parameters

##### netinst

Add a Network Instance IE to all outgoing PFCP rule sets, so that the UPF may choose the correct interface to open GTP tunnels on.

##### access

Set the Network Instance name for the access side (towards RAN).

##### core

Set the Network Instance name for the core side.

##### NAME

The Network Instance name as a dotted string, typically a domain name like 'ran23.example.com'. A matching osmo-upf.cfg could be: 'netinst' / 'add ran23.example.com 10.0.0.23'. See 3GPP TS 29.244 8.2.4.

### 1.21.4 remote-addr IP\_ADDR

#### Command

```
remote-addr IP_ADDR
```

#### Parameters

##### remote-addr

Remote UPF's listen IP address; where to send PFCP requests

##### IP\_ADDR

IP address

## 1.22 config-msc

### 1.22.1 allow-attach

#### Command

```
allow-attach
```

#### Global attributes

##### Flag: !

This command applies immediately

#### Parameters

##### allow-attach

Allow this CN link to attach new subscribers (default).

---

### 1.22.2 allow-emergency

#### Command

```
allow-emergency
```

#### Global attributes

#### Flag: !

This command applies immediately

#### Parameters

#### allow-emergency

Allow CM ServiceRequests with type emergency on this CN link

### 1.22.3 apply sccp

#### Command

```
apply sccp
```

#### Parameters

#### apply

Immediately use configuration modified via telnet VTY, and restart components as needed.

#### sccp

For telnet VTY: apply SCCP and NRI config changes made to this CN link in the running osmo-hnbgw process. If 'remote-addr' changed, related SCCP links will be restarted, possibly dropping active UE contexts. This is run implicitly on program startup, only useful to apply changes made later via telnet VTY.

### 1.22.4 no allow-attach

#### Command

```
no allow-attach
```

#### Global attributes

#### Flag: !

This command applies immediately

#### Parameters

#### no

Negate a command or set its defaults

#### allow-attach

Do not assign new subscribers to this CN link. Useful if an CN link in an CN link pool is configured to off-load subscribers. The CN link will still be operational for already IMSI-Attached subscribers, but the NAS node selection function will skip this CN link for new subscribers

### 1.22.5 no allow-emergency

#### Command

```
no allow-emergency
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

no

Negate a command or set its defaults

allow-emergency

Do not serve CM ServiceRequests with type emergency on this CN link

### 1.22.6 nri add <0-32767> [<0-32767>]

#### Command

```
nri add <0-32767> [<0-32767>]
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

add

Add NRI value or range to the NRI mapping for this CN link

<0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

[<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

---

### 1.22.7 nri del <0-32767> [<0-32767>]

#### Command

```
nri del <0-32767> [<0-32767>]
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

del

Remove NRI value or range from the NRI mapping for this CN link

<0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

[<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

### 1.22.8 remote-addr NAME

#### Command

```
remote-addr NAME
```

#### Parameters

remote-addr

SCCP address to send RANAP/SCCP to

NAME

SCCP address book entry name (see 'cs7 instance' / 'sccp-address')

### 1.22.9 show nri

#### Command

```
show nri
```

#### Parameters

show

Show running system information

nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

---

## 1.23 config-sgsn

### 1.23.1 allow-attach

Command

```
allow-attach
```

Global attributes

Flag: !

This command applies immediately

Parameters

allow-attach

Allow this CN link to attach new subscribers (default).

### 1.23.2 allow-emergency

Command

```
allow-emergency
```

Global attributes

Flag: !

This command applies immediately

Parameters

allow-emergency

Allow CM ServiceRequests with type emergency on this CN link

### 1.23.3 apply sccp

Command

```
apply sccp
```

Parameters

apply

Immediately use configuration modified via telnet VTY, and restart components as needed.

sccp

For telnet VTY: apply SCCP and NRI config changes made to this CN link in the running osmo-hnbgw process. If 'remote-addr' changed, related SCCP links will be restarted, possibly dropping active UE contexts. This is run implicitly on program startup, only useful to apply changes made later via telnet VTY.

---

### 1.23.4 no allow-attach

#### Command

```
no allow-attach
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

no

Negate a command or set its defaults

allow-attach

Do not assign new subscribers to this CN link. Useful if an CN link in an CN link pool is configured to off-load subscribers. The CN link will still be operational for already IMSI-Attached subscribers, but the NAS node selection function will skip this CN link for new subscribers

### 1.23.5 no allow-emergency

#### Command

```
no allow-emergency
```

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

no

Negate a command or set its defaults

allow-emergency

Do not serve CM ServiceRequests with type emergency on this CN link

### 1.23.6 nri add <0-32767> [<0-32767>]

#### Command

```
nri add <0-32767> [<0-32767>]
```

#### Global attributes

---

Flag: !

This command applies immediately

Parameters

nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

add

Add NRI value or range to the NRI mapping for this CN link

<0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

[<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

### 1.23.7 nri del <0-32767> [<0-32767>]

Command

```
nri del <0-32767> [<0-32767>]
```

Global attributes

Flag: !

This command applies immediately

Parameters

nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling

del

Remove NRI value or range from the NRI mapping for this CN link

<0-32767>

First value of the NRI value range, should not surpass the configured 'nri bitlen'.

[<0-32767>]

Last value of the NRI value range, should not surpass the configured 'nri bitlen' and be larger than the first value; if omitted, apply only the first value.

### 1.23.8 remote-addr NAME

Command

```
remote-addr NAME
```

Parameters

remote-addr

SCCP address to send RANAP/SCCP to

NAME

SCCP address book entry name (see 'cs7 instance' / 'sccp-address')



### 1.23.9 show nri

#### Command

```
show nri
```

#### Parameters

##### show

Show running system information

##### nri

Mapping of Network Resource Indicators to this CN peer, for CN pooling