

## **OsmoGbProxy VTY Reference**

Copyright © 2021

This work is copyright by sysmocom - s.f.m.c. GmbH. All rights reserved.

<b>COLLABORATORS</b>
----------------------

	<i>TITLE :</i> OsmoGbProxy VTY Reference		
<i>ACTION</i>	<i>NAME</i>	<i>DATE</i>	<i>SIGNATURE</i>
WRITTEN BY		June 12, 2025	

<b>REVISION HISTORY</b>
-------------------------

NUMBER	DATE	DESCRIPTION	NAME
DRAFT	unknown	Automatically Generated VTY Reference	dw

# Contents

<b>1</b>	<b>VTY reference</b>	<b>1</b>
1.1	Common Commands	1
1.1.1	end	2
1.1.2	exit	2
1.1.3	help	2
1.1.4	list [with-flags]	2
1.1.5	show running-config	3
1.1.6	show vty-attributes	3
1.1.7	show vty-attributes (application library global)	3
1.1.8	write	4
1.1.9	write file [PATH]	4
1.1.10	write memory	4
1.1.11	write terminal	4
1.2	view	5
1.2.1	enable [expert-mode]	5
1.2.2	logging color (0 1)	5
1.2.3	logging disable	5
1.2.4	logging enable	6
1.2.5	logging filter all (0 1)	6
1.2.6	logging filter bvc bvci <0-65535>	6
1.2.7	logging filter nse nsei <0-65535>	7
1.2.8	logging filter nsvc nsvci <0-65535>	7
1.2.9	logging level (gprs obj l global l lapd l inpl mux l mib l sms l ctrl l gtpl stats l ...	8
1.2.10	logging level force-all (debug info notice error fatal)	10
1.2.11	logging level set-all (debug info notice error fatal)	11
1.2.12	logging print category (0 1)	11
1.2.13	logging print category-hex (0 1)	12
1.2.14	logging print extended-timestamp (0 1)	12
1.2.15	logging print file (0 1 basename) [last]	13
1.2.16	logging print level (0 1)	13

1.2.17	logging print thread-id (0 1)	14
1.2.18	logging set-log-mask MASK	14
1.2.19	logging timestamp (0 1)	14
1.2.20	logp (gprs obj l global l lapd l in l mux l mi l mib l sms l ctr l l gtp l stats l gsup l oa...	15
1.2.21	no logging level force-all	17
1.2.22	show alarms	17
1.2.23	show asciidoc counters	18
1.2.24	show cpu-sched threads	18
1.2.25	show fsm NAME	18
1.2.26	show fsm all	19
1.2.27	show fsm-instances NAME	19
1.2.28	show fsm-instances all	19
1.2.29	show fsm-state-graph NAME	20
1.2.30	show gbproxy bvc (bss sgsn) [stats]	20
1.2.31	show gbproxy bvc (bss sgsn) nsei <0-65535> [stats]	20
1.2.32	show gbproxy cell [stats]	21
1.2.33	show gbproxy cell nsei <0-65535> [stats]	21
1.2.34	show gbproxy imsi-cache	22
1.2.35	show gbproxy tlli-cache	22
1.2.36	show history	23
1.2.37	show logging vty	23
1.2.38	show nri all	23
1.2.39	show nri nsei <0-65535>	24
1.2.40	show ns (nsei nsvc) <0-65535> [stats]	24
1.2.41	show ns binds [stats]	25
1.2.42	show ns entities [stats]	25
1.2.43	show ns persistent	25
1.2.44	show online-help	26
1.2.45	show pid	26
1.2.46	show rate-counters [skip-zero]	26
1.2.47	show runtime	27
1.2.48	show stats [skip-zero]	27
1.2.49	show stats level (global peer subscriber) [skip-zero]	27
1.2.50	show talloc-context (application global all) (full brief DEPTH)	28
1.2.51	show talloc-context (application global all) (full brief DEPTH) filter REGEXP	28
1.2.52	show talloc-context (application global all) (full brief DEPTH) tree ADDRESS	29
1.2.53	show uptime	30
1.2.54	show version	30
1.2.55	terminal length <0-512>	30

1.2.56	terminal no length	31
1.2.57	who	31
1.3	enable	31
1.3.1	configure [terminal]	31
1.3.2	copy running-config startup-config	32
1.3.3	delete-gbproxy-peer <0-65534> (only-bvclonly-nsvclall) [dry-run]	32
1.3.4	delete-gbproxy-peer <0-65534> bvci <2-65534>	32
1.3.5	disable	33
1.3.6	logging color (0 1)	33
1.3.7	logging disable	33
1.3.8	logging enable	34
1.3.9	logging filter all (0 1)	34
1.3.10	logging filter bvc bvci <0-65535>	34
1.3.11	logging filter nse nsei <0-65535>	35
1.3.12	logging filter nsvc nsvci <0-65535>	35
1.3.13	logging level (gprslobjllgloballllapdllinpllmuxllmillmibllsmsllctrlllgtpllstatsl...	36
1.3.14	logging level force-all (debuglinfofnoticeerrorlfatal)	38
1.3.15	logging level set-all (debuglinfofnoticeerrorlfatal)	39
1.3.16	logging print category (0 1)	39
1.3.17	logging print category-hex (0 1)	40
1.3.18	logging print extended-timestamp (0 1)	40
1.3.19	logging print file (0 1 basename) [last]	41
1.3.20	logging print level (0 1)	41
1.3.21	logging print thread-id (0 1)	42
1.3.22	logging set-log-mask MASK	42
1.3.23	logging timestamp (0 1)	42
1.3.24	logp (gprslobjllgloballllapdllinpllmuxllmillmibllsmsllctrlllgtpllstatsllgsuplloa...	43
1.3.25	no logging level force-all	45
1.3.26	nse <0-65535> restart-sns	45
1.3.27	nsvc <0-65535> (blocklunblocklreset)	46
1.3.28	show alarms	46
1.3.29	show asciidoc counters	46
1.3.30	show cpu-sched threads	47
1.3.31	show fsm NAME	47
1.3.32	show fsm all	47
1.3.33	show fsm-instances NAME	48
1.3.34	show fsm-instances all	48
1.3.35	show fsm-state-graph NAME	48
1.3.36	show gbproxy bvc (bsslsgsn) [stats]	49

1.3.37	show gbproxy bvc (bsslsn) nsei <0-65535> [stats]	49
1.3.38	show gbproxy cell [stats]	50
1.3.39	show gbproxy cell nsei <0-65535> [stats]	50
1.3.40	show gbproxy imsi-cache	51
1.3.41	show gbproxy tlli-cache	51
1.3.42	show history	51
1.3.43	show logging vty	52
1.3.44	show nri all	52
1.3.45	show nri nsei <0-65535>	52
1.3.46	show ns (nseilnsvc) <0-65535> [stats]	53
1.3.47	show ns binds [stats]	53
1.3.48	show ns entities [stats]	54
1.3.49	show ns persistent	54
1.3.50	show online-help	54
1.3.51	show rate-counters [skip-zero]	55
1.3.52	show runtime	55
1.3.53	show startup-config	55
1.3.54	show stats [skip-zero]	56
1.3.55	show stats level (global peer subscriber) [skip-zero]	56
1.3.56	show talloc-context (application global all) (full brief DEPTH)	57
1.3.57	show talloc-context (application global all) (full brief DEPTH) filter REGEXP	57
1.3.58	show talloc-context (application global all) (full brief DEPTH) tree ADDRESS	58
1.3.59	show version	59
1.3.60	shutdown	59
1.3.61	stats report	59
1.3.62	stats reset	59
1.3.63	terminal length <0-512>	60
1.3.64	terminal monitor	60
1.3.65	terminal no length	60
1.3.66	terminal no monitor	61
1.3.67	who	61
1.4	config	61
1.4.1	banner motd default	61
1.4.2	banner motd file [FILE]	62
1.4.3	cpu-sched	62
1.4.4	ctrl	62
1.4.5	enable password (8l) WORD	63
1.4.6	enable password LINE	63
1.4.7	gbproxy	63

1.4.8	hostname WORD . . . . .	64
1.4.9	line vty . . . . .	64
1.4.10	log alarms <2-32700> . . . . .	64
1.4.11	log file FILENAME [blocking-io] . . . . .	65
1.4.12	log gsmtp [HOSTNAME] . . . . .	65
1.4.13	log stderr [blocking-io] . . . . .	65
1.4.14	log syslog (authpriv cron daemon ftplib mailnews user uucp) . . . . .	66
1.4.15	log syslog local <0-7> . . . . .	66
1.4.16	log systemd-journal [raw] . . . . .	67
1.4.17	no banner motd . . . . .	67
1.4.18	no enable password . . . . .	67
1.4.19	no hostname [HOSTNAME] . . . . .	68
1.4.20	no log alarms . . . . .	68
1.4.21	no log file FILENAME . . . . .	68
1.4.22	no log gsmtp [HOSTNAME] . . . . .	69
1.4.23	no log stderr . . . . .	69
1.4.24	no log syslog . . . . .	69
1.4.25	no log systemd-journal . . . . .	70
1.4.26	no service advanced-vty . . . . .	70
1.4.27	no service terminal-length [<0-512>] . . . . .	70
1.4.28	no stats reporter log [NAME] . . . . .	71
1.4.29	no stats reporter statsd [NAME] . . . . .	71
1.4.30	ns . . . . .	71
1.4.31	password (8l) WORD . . . . .	72
1.4.32	password LINE . . . . .	72
1.4.33	service advanced-vty . . . . .	72
1.4.34	service terminal-length <0-512> . . . . .	73
1.4.35	sgsn nsei <0-65534> . . . . .	73
1.4.36	show history . . . . .	73
1.4.37	stats interval <0-65535> . . . . .	74
1.4.38	stats reporter log [NAME] . . . . .	74
1.4.39	stats reporter statsd [NAME] . . . . .	74
1.4.40	stats-tcp batch-size <1-65535> . . . . .	75
1.4.41	stats-tcp interval <0-65535> . . . . .	75
1.5	config-log . . . . .	75
1.5.1	logging color (0l1) . . . . .	75
1.5.2	logging filter all (0l1) . . . . .	76
1.5.3	logging filter nsei <0-65535> . . . . .	76
1.5.4	logging filter nsvc nsvci <0-65535> . . . . .	77



1.5.5	logging level (gprslobjllgloballlapdllinpllmuxllmillmibllsmsllctrlllgtplstatsl...	77
1.5.6	logging level force-all (debuglinfolnoticeerrorlfatal)	79
1.5.7	logging level set-all (debuglinfolnoticeerrorlfatal)	80
1.5.8	logging print category (0l1)	81
1.5.9	logging print category-hex (0l1)	81
1.5.10	logging print extended-timestamp (0l1)	82
1.5.11	logging print file (0l1 basename) [last]	82
1.5.12	logging print level (0l1)	83
1.5.13	logging print thread-id (0l1)	83
1.5.14	logging timestamp (0l1)	84
1.5.15	no logging level force-all	84
1.6	config-stats	84
1.6.1	disable	84
1.6.2	enable	85
1.6.3	flush-period <0-65535>	85
1.6.4	level (globalpeerlsubscriber)	85
1.6.5	local-ip ADDR	86
1.6.6	mtu <100-65535>	86
1.6.7	no local-ip	86
1.6.8	no mtu	86
1.6.9	no prefix	87
1.6.10	prefix PREFIX	87
1.6.11	remote-ip ADDR	87
1.6.12	remote-port <1-65535>	87
1.7	config-line	88
1.7.1	bind A.B.C.D [<0-65535>]	88
1.7.2	login	88
1.7.3	no login	88
1.8	config-ns	89
1.8.1	bind (frludp) ID	89
1.8.2	ip-sns-default bind ID	89
1.8.3	no bind ID	89
1.8.4	no ip-sns-default bind ID	90
1.8.5	no nse <0-65535>	90
1.8.6	nse <0-65535> [ip-sns-role-sgsn]	90
1.8.7	timer (tns-block tns-block-retries tns-reset tns-reset-retries tns-test tns-aliv...	91
1.8.8	txqueue-max-length <1-4096>	92
1.9	config-ctrl	92
1.9.1	bind A.B.C.D [<0-65535>]	92

1.10	config-cpu-sched	92
1.10.1	cpu-affinity (self all <0-4294967295> THREADNAME) CPUHEXMASK [delay]	92
1.10.2	policy rr <1-32>	93
1.11	config-ns-bind	93
1.11.1	accept-dynamic-ip-sns	93
1.11.2	accept-ipaccess	94
1.11.3	dscp <0-63>	94
1.11.4	fr NETIF (fr frnet)	94
1.11.5	ip-sns signalling-weight <0-254> data-weight <0-254>	95
1.11.6	listen (A.B.C.D X:X::X:X) <1-65535>	95
1.11.7	no accept-dynamic-ip-sns	95
1.11.8	no accept-ipaccess	96
1.11.9	no dscp	96
1.11.10	no fr NETIF	96
1.11.11	no listen	97
1.11.12	socket-priority <0-255>	97
1.12	config-ns-nse	97
1.12.1	ip-sns-bind BINDID	97
1.12.2	ip-sns-remote (A.B.C.D X:X::X:X) <1-65535>	98
1.12.3	no ip-sns-bind BINDID	98
1.12.4	no ip-sns-remote (A.B.C.D X:X::X:X) <1-65535>	98
1.12.5	no nsvc fr NETIF dlci <16-1007>	99
1.12.6	no nsvc ipa BIND (A.B.C.D X:X::X:X) <1-65535> nsvci <0-65535>	99
1.12.7	no nsvc nsvci <0-65535>	100
1.12.8	no nsvc udp BIND (A.B.C.D X:X::X:X) <1-65535>	100
1.12.9	nsvc fr NETIF dlci <16-1007> nsvci <0-65535>	101
1.12.10	nsvc ipa BIND (A.B.C.D X:X::X:X) <1-65535> nsvci <0-65535>	101
1.12.11	nsvc udp BIND (A.B.C.D X:X::X:X) <1-65535>	102
1.12.12	nsvc udp BIND (A.B.C.D X:X::X:X) <1-65535> signalling-weight <0-254> data-weight...	103
1.13	config-gbproxy	103
1.13.1	nri bitlen <0-15>	103
1.13.2	nri null add <0-32767> [<0-32767>]	104
1.13.3	nri null del <0-32767> [<0-32767>]	105
1.13.4	pool bvc-flow-control-ratio <1-100>	105
1.14	config-sgsn	106
1.14.1	allow-attach	106
1.14.2	name NAME	106
1.14.3	no allow-attach	106
1.14.4	nri add <0-32767> [<0-32767>]	107
1.14.5	nri del <0-32767> [<0-32767>]	107

# List of Tables

1.1	VTY Parameter Patterns . . . . .	1
1.2	VTY port numbers . . . . .	1

# 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 filter bvc bvci <0-65535>

Command

```
logging filter bvc bvci <0-65535>
```

Parameters

---

logging

Configure logging

filter

Filter log messages

bvc

Filter based on BSSGP VC

bvci

Identify BVC by BVCI

<0-65535>

Numeric identifier

### 1.2.7 logging filter nse nsei <0-65535>

Command

```
logging filter nse nsei <0-65535>
```

Parameters

logging

Configure logging

filter

Filter log messages

nse

Filter based on NS Entity

nsei

Identify NSE by NSEI

<0-65535>

Numeric identifier

### 1.2.8 logging filter nsvc nsvci <0-65535>

Command

```
logging filter nsvc nsvci <0-65535>
```

Parameters

logging

Configure logging

filter

Filter log messages

nsvc

Filter based on NS Virtual Connection

nsvci

Identify NS-VC by NSVCI

<0-65535>

Numeric identifier

## 1.2.9 logging level (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|...

Command

```
logging level (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|lgsup|
              loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lns|lbssgp|lnsdata|lnssignal|liuup|
              lpfcpl|lcsn1|lio) (debug|info|notice|error|fatal) ↵ ↵
```

Parameters

logging

Configure logging

level

Set the log level for a specified category

gprs

GPRS Packet Service

obj

GbProxy object allocation/release

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

### 1.2.10 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

---

### 1.2.11 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

### 1.2.12 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

---

### 1.2.13 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>')

### 1.2.14 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

---

### 1.2.15 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.

### 1.2.16 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



### 1.2.17 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

### 1.2.18 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

### 1.2.19 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

**1.2.20 logp (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|lgsup|loa...****Command**

```
logp (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|lgsup|loap|lss7| ↵
      lscdp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lms|lbssgp|lmsdata|lmsignal|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

**gprs**

GPRS Packet Service

**obj**

GbProxy object allocation/release

**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

.LOGMESSAGE

Arbitrary message to log on given category and log level

### 1.2.21 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>'

### 1.2.22 show alarms

Command

```
show alarms
```

Parameters

show

Show running system information

alarms

Show current logging configuration

### 1.2.23 show asciidoc counters

#### Command

```
show asciidoc counters
```

#### Parameters

##### show

Show running system information

##### asciidoc

Asciidoc generation

##### counters

Generate table of all registered counters

### 1.2.24 show cpu-sched threads

#### Command

```
show cpu-sched threads
```

#### Parameters

##### show

Show running system information

##### cpu-sched

Show Sched section information

##### threads

Show information about running threads)

### 1.2.25 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

---

### 1.2.26 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

### 1.2.27 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

### 1.2.28 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

---

### 1.2.29 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

### 1.2.30 show gbproxy bvc (bss|sgsn) [stats]

#### Command

```
show gbproxy bvc (bss|sgsn) [stats]
```

#### Parameters

show

Show running system information

gbproxy

Display information about the Gb proxy

bvc

Show BSSGP Virtual Connections

bss

Display BSS-side BVCs

sgsn

Display SGSN-side BVCs

[stats]

Show statistics

### 1.2.31 show gbproxy bvc (bss|sgsn) nsei <0-65535> [stats]

#### Command

```
show gbproxy bvc (bss|sgsn) nsei <0-65535> [stats]
```

#### Parameters

---

show

Show running system information

gbproxy

Display information about the Gb proxy

bvc

Show BSSGP Virtual Connections

bss

Display BSS-side BVCs

sgsn

Display SGSN-side BVCs

nsei

Limit display to cells from an NSE

<0-65535>

NSEI to use

[stats]

Show statistics

### 1.2.32 show gbproxy cell [stats]

Command

```
show gbproxy cell [stats]
```

Parameters

show

Show running system information

gbproxy

Display information about the Gb proxy

cell

Show GPRS Cell Information

[stats]

Show statistics

### 1.2.33 show gbproxy cell nsei <0-65535> [stats]

Command

```
show gbproxy cell nsei <0-65535> [stats]
```

Parameters

---



show

Show running system information

gbproxy

Display information about the Gb proxy

cell

Show GPRS Cell Information

nsei

Limit display to cells from an NSE

<0-65535>

NSEI to use

[stats]

Show statistics

### 1.2.34 show gbproxy imsi-cache

Command

```
show gbproxy imsi-cache
```

Parameters

show

Show running system information

gbproxy

Display information about the Gb proxy

imsi-cache

Show IMSI cache entries

### 1.2.35 show gbproxy tlli-cache

Command

```
show gbproxy tlli-cache
```

Parameters

show

Show running system information

gbproxy

Display information about the Gb proxy

tlli-cache

Show TLLI cache entries

### 1.2.36 show history

#### Command

```
show history
```

#### Parameters

##### show

Show running system information

##### history

Display the session command history

### 1.2.37 show logging vty

#### Command

```
show logging vty
```

#### Parameters

##### show

Show running system information

##### logging

Show current logging configuration

##### vty

Show current logging configuration for this vty

### 1.2.38 show nri all

#### Command

```
show nri all
```

#### Parameters

##### show

Show running system information

##### nri

Mapping of Network Resource Indicators to this SGSN, for SGSN pooling

##### all

Show all SGSNs

---

### 1.2.39 show nri nsei <0-65535>

#### Command

```
show nri nsei <0-65535>
```

#### Parameters

show

Show running system information

nri

Mapping of Network Resource Indicators to this SGSN, for SGSN pooling

nsei

Identify SGSN by NSEI

<0-65535>

NSEI of the SGSN

### 1.2.40 show ns (nsei|nsvc) <0-65535> [stats]

#### Command

```
show ns (nsei|nsvc) <0-65535> [stats]
```

#### Parameters

show

Show running system information

ns

Display information about the NS protocol

nsei

Select one NSE by its NSE Identifier

nsvc

Select one NSE by its NS-VC Identifier

<0-65535>

The Identifier of selected type

[stats]

Include Statistics

---

### 1.2.41 show ns binds [stats]

#### Command

```
show ns binds [stats]
```

#### Parameters

show

Show running system information

ns

Display information about the NS protocol

binds

Display information about the NS protocol binds

[stats]

Include statistic

### 1.2.42 show ns entities [stats]

#### Command

```
show ns entities [stats]
```

#### Parameters

show

Show running system information

ns

Display information about the NS protocol

entities

Display information about the NS protocol entities (NSEs)

[stats]

Include statistics

### 1.2.43 show ns persistent

#### Command

```
show ns persistent
```

#### Parameters

show

Show running system information

ns

Display information about the NS protocol

persistent

Show only persistent NS

---

### 1.2.44 show online-help

#### Command

```
show online-help
```

#### Parameters

##### show

Show running system information

##### online-help

Online help

### 1.2.45 show pid

#### Command

```
show pid
```

#### Parameters

##### show

Show running system information

##### pid

Displays the process ID

### 1.2.46 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

---

### 1.2.47 show runtime

#### Command

```
show runtime
```

#### Parameters

##### show

Show running system information

##### runtime

Display runtime information

### 1.2.48 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

### 1.2.49 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

### 1.2.50 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

### 1.2.51 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

### 1.2.52 **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)

**1.2.53 show uptime****Command**

```
show uptime
```

**Parameters****show**

Show running system information

**uptime**

Displays how long the program has been running

**1.2.54 show version****Command**

```
show version
```

**Parameters****show**

Show running system information

**version**

Displays program version

**1.2.55 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)

---

### 1.2.56 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

### 1.2.57 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 configure [terminal]

#### Command

```
configure [terminal]
```

#### Parameters

##### configure

Configuration from vty interface

##### [terminal]

Configuration terminal

### 1.3.2 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)

### 1.3.3 delete-gbproxy-peer <0-65534> (only-bvc|only-nsvc|all) [dry-run]

#### Command

```
delete-gbproxy-peer <0-65534> (only-bvc|only-nsvc|all) [dry-run]
```

#### Parameters

##### delete-gbproxy-peer

Delete a GBProxy bvc by NSEI and optionally BVCI

##### <0-65534>

NSEI number

##### only-bvc

Only delete BSSGP connections (BVC)

##### only-nsvc

Only delete dynamic NS connections (NS-VC)

##### all

Delete BVC and dynamic NS connections

##### [dry-run]

Show what would be deleted instead of actually deleting

### 1.3.4 delete-gbproxy-peer <0-65534> bvci <2-65534>

#### Command

```
delete-gbproxy-peer <0-65534> bvci <2-65534>
```

#### Parameters

---

**delete-gbproxy-peer**

Delete a GBProxy bvc by NSEI and optionally BVCI

<0-65534>

NSEI number

bvci

Only delete bvc with a matching BVCI

<2-65534>

BVCI number

### 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 filter bvc bvci <0-65535>

#### Command

```
logging filter bvc bvci <0-65535>
```

#### Parameters

---

logging

Configure logging

filter

Filter log messages

bvc

Filter based on BSSGP VC

bvci

Identify BVC by BVCI

<0-65535>

Numeric identifier

### 1.3.11 logging filter nse nsei <0-65535>

Command

```
logging filter nse nsei <0-65535>
```

Parameters

logging

Configure logging

filter

Filter log messages

nse

Filter based on NS Entity

nsei

Identify NSE by NSEI

<0-65535>

Numeric identifier

### 1.3.12 logging filter nsvc nsvci <0-65535>

Command

```
logging filter nsvc nsvci <0-65535>
```

Parameters

logging

Configure logging

filter

Filter log messages

nsvc

Filter based on NS Virtual Connection

nsvci

Identify NS-VC by NSVCI

<0-65535>

Numeric identifier

### 1.3.13 logging level (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|...

Command

```
logging level (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|lgsup| ↵
              loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lns|lbssgp|lndata|lnsignal|liuup| ↵
              lpfcpl|lcn1|lio) (debug|info|notice|error|fatal)
```

Parameters

logging

Configure logging

level

Set the log level for a specified category

gprs

GPRS Packet Service

obj

GbProxy object allocation/release

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

### 1.3.14 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

---

### 1.3.15 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

### 1.3.16 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

---

### 1.3.17 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>')

### 1.3.18 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

### 1.3.19 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.

### 1.3.20 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

### 1.3.21 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

### 1.3.22 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

### 1.3.23 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

**1.3.24 logp (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|lgsup|loa...****Command**

```
logp (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|lgsup|loap|lss7| ↵
    lscgp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lms|lbssgp|lmsdata|lmsignal|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

**gprs**

GPRS Packet Service

**obj**

GbProxy object allocation/release

**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

**.LOGMESSAGE**

Arbitrary message to log on given category and log level

### 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 nse <0-65535> restart-sns

**Command**

```
nse <0-65535> restart-sns
```

**Parameters****nse**

NSE specific commands

**<0-65535>**

NS Entity ID (NSEI)

**restart-sns**

Restart SNS procedure



### 1.3.27 nsvc <0-65535> (block|unblock|reset)

#### Command

```
nsvc <0-65535> (block|unblock|reset)
```

#### Parameters

nsvc

NS Virtual Connection

<0-65535>

NS Virtual Connection ID (NS-VCI)

block

Block a NSVC. As cause code O&M intervention will be used.

unblock

Unblock a NSVC. As cause code O&M intervention will be used.

reset

Reset a NSVC. As cause code O&M intervention will be used.

### 1.3.28 show alarms

#### Command

```
show alarms
```

#### Parameters

show

Show running system information

alarms

Show current logging configuration

### 1.3.29 show asciidoc counters

#### Command

```
show asciidoc counters
```

#### Parameters

show

Show running system information

asciidoc

Asciidoc generation

counters

Generate table of all registered counters

### 1.3.30 show cpu-sched threads

#### Command

```
show cpu-sched threads
```

#### Parameters

show

Show running system information

cpu-sched

Show Sched section information

threads

Show information about running threads)

### 1.3.31 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

### 1.3.32 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

---

### 1.3.33 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

### 1.3.34 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

### 1.3.35 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

---

### 1.3.36 show gbproxy bvc (bss|sgsn) [stats]

#### Command

```
show gbproxy bvc (bss|sgsn) [stats]
```

#### Parameters

##### show

Show running system information

##### gbproxy

Display information about the Gb proxy

##### bvc

Show BSSGP Virtual Connections

##### bss

Display BSS-side BVCs

##### sgsn

Display SGSN-side BVCs

##### [stats]

Show statistics

### 1.3.37 show gbproxy bvc (bss|sgsn) nsei <0-65535> [stats]

#### Command

```
show gbproxy bvc (bss|sgsn) nsei <0-65535> [stats]
```

#### Parameters

##### show

Show running system information

##### gbproxy

Display information about the Gb proxy

##### bvc

Show BSSGP Virtual Connections

##### bss

Display BSS-side BVCs

##### sgsn

Display SGSN-side BVCs

##### nsei

Limit display to cells from an NSE

##### <0-65535>

NSEI to use

##### [stats]

Show statistics

### 1.3.38 show gbproxy cell [stats]

#### Command

```
show gbproxy cell [stats]
```

#### Parameters

##### show

Show running system information

##### gbproxy

Display information about the Gb proxy

##### cell

Show GPRS Cell Information

##### [stats]

Show statistics

### 1.3.39 show gbproxy cell nsei <0-65535> [stats]

#### Command

```
show gbproxy cell nsei <0-65535> [stats]
```

#### Parameters

##### show

Show running system information

##### gbproxy

Display information about the Gb proxy

##### cell

Show GPRS Cell Information

##### nsei

Limit display to cells from an NSE

##### <0-65535>

NSEI to use

##### [stats]

Show statistics

### 1.3.40 show gbproxy imsi-cache

#### Command

```
show gbproxy imsi-cache
```

#### Parameters

show

Show running system information

gbproxy

Display information about the Gb proxy

imsi-cache

Show IMSI cache entries

### 1.3.41 show gbproxy tlli-cache

#### Command

```
show gbproxy tlli-cache
```

#### Parameters

show

Show running system information

gbproxy

Display information about the Gb proxy

tlli-cache

Show TLLI cache entries

### 1.3.42 show history

#### Command

```
show history
```

#### Parameters

show

Show running system information

history

Display the session command history

### 1.3.43 show logging vty

#### Command

```
show logging vty
```

#### Parameters

show

Show running system information

logging

Show current logging configuration

vtv

Show current logging configuration for this vty

### 1.3.44 show nri all

#### Command

```
show nri all
```

#### Parameters

show

Show running system information

nri

Mapping of Network Resource Indicators to this SGSN, for SGSN pooling

all

Show all SGSNs

### 1.3.45 show nri nsei <0-65535>

#### Command

```
show nri nsei <0-65535>
```

#### Parameters

show

Show running system information

nri

Mapping of Network Resource Indicators to this SGSN, for SGSN pooling

nsei

Identify SGSN by NSEI

<0-65535>

NSEI of the SGSN

---

### 1.3.46 show ns (nsei|nsvc) <0-65535> [stats]

#### Command

```
show ns (nsei|nsvc) <0-65535> [stats]
```

#### Parameters

##### show

Show running system information

##### ns

Display information about the NS protocol

##### nsei

Select one NSE by its NSE Identifier

##### nsvc

Select one NSE by its NS-VC Identifier

##### <0-65535>

The Identifier of selected type

##### [stats]

Include Statistics

### 1.3.47 show ns binds [stats]

#### Command

```
show ns binds [stats]
```

#### Parameters

##### show

Show running system information

##### ns

Display information about the NS protocol

##### binds

Display information about the NS protocol binds

##### [stats]

Include statistic



### 1.3.48 show ns entities [stats]

#### Command

```
show ns entities [stats]
```

#### Parameters

##### show

Show running system information

##### ns

Display information about the NS protocol

##### entities

Display information about the NS protocol entities (NSEs)

##### [stats]

Include statistics

### 1.3.49 show ns persistent

#### Command

```
show ns persistent
```

#### Parameters

##### show

Show running system information

##### ns

Display information about the NS protocol

##### persistent

Show only persistent NS

### 1.3.50 show online-help

#### Command

```
show online-help
```

#### Parameters

##### show

Show running system information

##### online-help

Online help

### 1.3.51 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

### 1.3.52 show runtime

#### Command

```
show runtime
```

#### Parameters

##### show

Show running system information

##### runtime

Display runtime information

### 1.3.53 show startup-config

#### Command

```
show startup-config
```

#### Parameters

##### show

Show running system information

##### startup-config

Contentes of startup configuration

---

### 1.3.54 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

### 1.3.55 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

---

### 1.3.56 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

### 1.3.57 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

### 1.3.58 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)

---

### 1.3.59 show version

#### Command

```
show version
```

#### Parameters

##### show

Show running system information

##### version

Displays program version

### 1.3.60 shutdown

#### Command

```
shutdown
```

#### Parameters

##### shutdown

Request a shutdown of the program

### 1.3.61 stats report

#### Command

```
stats report
```

#### Parameters

##### stats

Stats related commands

##### report

Manurally trigger reporting of stats

### 1.3.62 stats reset

#### Command

```
stats reset
```

#### Parameters

##### stats

Stats related commands

##### reset

Reset all rate counter stats

---

### 1.3.63 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)

### 1.3.64 terminal monitor

#### Command

```
terminal monitor
```

#### Parameters

##### terminal

Set terminal line parameters

##### monitor

Copy debug output to the current terminal line

### 1.3.65 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

### 1.3.66 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

### 1.3.67 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 banner motd default

#### Command

```
banner motd default
```

#### Parameters

##### banner

Set banner string

##### motd

Strings for motd

##### default

Default string

---



### 1.4.2 banner motd file [FILE]

#### Command

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

#### Parameters

##### banner

Set banner

##### motd

Banner for motd

##### file

Banner from a file

##### [FILE]

Filename

### 1.4.3 cpu-sched

#### Command

```
cpu-sched
```

#### Parameters

##### cpu-sched

Configure CPU Scheduler related settings

### 1.4.4 ctrl

#### Command

```
ctrl
```

#### Parameters

##### ctrl

Configure the Control Interface

---

### 1.4.5 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

### 1.4.6 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

### 1.4.7 gbproxy

#### Command

```
gbproxy
```

#### Parameters

##### gbproxy

Configure the Gb proxy

### 1.4.8 hostname WORD

#### Command

```
hostname WORD
```

#### Parameters

##### hostname

Set system's network name

##### WORD

This system's network name

### 1.4.9 line vty

#### Command

```
line vty
```

#### Parameters

##### line

Configure a terminal line

##### vty

Virtual terminal

### 1.4.10 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

---

### 1.4.11 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

### 1.4.12 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)

### 1.4.13 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

---

#### 1.4.14 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

#### 1.4.15 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

### 1.4.16 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

### 1.4.17 no banner motd

Command

```
no banner motd
```

Parameters

no

Negate a command or set its defaults

banner

Set banner string

motd

Strings for motd

### 1.4.18 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

---

### 1.4.19 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

### 1.4.20 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

### 1.4.21 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

### 1.4.22 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)

### 1.4.23 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

### 1.4.24 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

---



### 1.4.25 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

### 1.4.26 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

### 1.4.27 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)

---

### 1.4.28 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

### 1.4.29 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

### 1.4.30 ns

#### Command

```
ns
```

#### Parameters

ns

Configure the GPRS Network Service

### 1.4.31 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

### 1.4.32 password LINE

#### Command

```
password LINE
```

#### Parameters

##### password

Assign the terminal connection password

##### LINE

The UNENCRYPTED (cleartext) line password

### 1.4.33 service advanced-vty

#### Command

```
service advanced-vty
```

#### Parameters

##### service

Set up miscellaneous service

##### advanced-vty

Enable advanced mode vty interface

---

### 1.4.34 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)

### 1.4.35 sgsn nsei <0-65534>

#### Command

```
sgsn nsei <0-65534>
```

#### Parameters

##### sgsn

Configure the SGSN

##### nsei

NSEI to be used in the connection with the SGSN

##### <0-65534>

The NSEI

### 1.4.36 show history

#### Command

```
show history
```

#### Parameters

##### show

Show running system information

##### history

Display the session command history

### 1.4.37 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)

### 1.4.38 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

### 1.4.39 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

---

### 1.4.40 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

### 1.4.41 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 filter nse nsei <0-65535>

#### Command

```
logging filter nse nsei <0-65535>
```

#### Parameters

## logging

Configure logging

filter

Filter log messages

nse

Filter based on NS Entity

nsei

Identify NSE by NSEI

<0-65535>

Numeric identifier

### 1.5.4 logging filter nsvc nsvci <0-65535>

Command

```
logging filter nsvc nsvci <0-65535>
```

Parameters

logging

Configure logging

filter

Filter log messages

nsvc

Filter based on NS Virtual Connection

nsvci

Identify NS-VC by NSVCI

<0-65535>

Numeric identifier

### 1.5.5 logging level (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|...

Command

```
logging level (gprs|obj|lglobal|llapd|linp|lmux|lmi|lmib|lsms|lctrl|lgtp|lstats|lgsup| ↵
    loap|lss7|lscpp|lsua|lm3ua|lmgcp|ljibuf|lrspro|lms|lbssgp|lmsdata|lmsignal|liuup| ↵
    lpfcpl|lcsn1|lio) (debug|info|notice|error|fatal)
```

Parameters

logging

Configure logging

level

Set the log level for a specified category

gprs

GPRS Packet Service



---

obj  
GbProxy object allocation/release

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
lrs	GPRS NS layer
lbssgp	GPRS BSSGP layer
lrsdata	GPRS NS layer data PDU
lrsignal	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

### 1.5.6 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

### 1.5.7 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

---

### 1.5.8 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

### 1.5.9 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>')

### 1.5.10 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

### 1.5.11 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.

### 1.5.12 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

### 1.5.13 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

### 1.5.14 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

### 1.5.15 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-ns

### 1.8.1 bind (fr|udp) ID

Command

```
bind (fr|udp) ID
```

Parameters

bind

Configure local Bind

fr

Frame Relay

udp

UDP/IP

ID

Unique identifier for this bind (to reference from NS-VCs, NSEs, ...)

### 1.8.2 ip-sns-default bind ID

Command

```
ip-sns-default bind ID
```

Parameters

ip-sns-default

Defaults for dynamically created NSEs created by IP-SNS in SGSN role

bind

IP SNS binds

ID

Name of NS udp bind whose IP endpoint will be used as IP-SNS local endpoint. Can be given multiple times.

### 1.8.3 no bind ID

Command

```
no bind ID
```

Parameters

no

Negate a command or set its defaults

bind

Delete a bind

ID

Unique identifier for this bind

---

### 1.8.4 no ip-sns-default bind ID

#### Command

```
no ip-sns-default bind ID
```

#### Parameters

no

Negate a command or set its defaults

ip-sns-default

Defaults for dynamically created NSEs created by IP-SNS in SGSN role

bind

IP SNS binds

ID

Name of NS udp bind whose IP endpoint will be removed as IP-SNS local endpoint.

### 1.8.5 no nse <0-65535>

#### Command

```
no nse <0-65535>
```

#### Parameters

no

Negate a command or set its defaults

nse

Delete a Persistent NS Entity

<0-65535>

NS Entity ID (NSEI)

### 1.8.6 nse <0-65535> [ip-sns-role-sgsn]

#### Command

```
nse <0-65535> [ip-sns-role-sgsn]
```

#### Parameters

nse

Persistent NS Entity

<0-65535>

NS Entity ID (NSEI)

[ip-sns-role-sgsn]

Create NSE in SGSN role (default: BSS)

---

### 1.8.7 timer (tns-block|tns-block-retries|tns-reset|tns-reset-retries|tns-test|tns-aliv...

#### Command

```
timer (tns-block|tns-block-retries|tns-reset|tns-reset-retries|tns-test|tns-alive|tns- ↵  
    alive-retries|tsns-prov|tsns-size-retries|tsns-config-retries|tsns-procedures- ↵  
    retries) <0-65535>
```

#### Parameters

##### timer

Network Service Timer

##### tns-block

(un)blocking Timer (Tns-block) timeout

##### tns-block-retries

(un)blocking Timer (Tns-block) number of retries

##### tns-reset

Reset Timer (Tns-reset) timeout

##### tns-reset-retries

Reset Timer (Tns-reset) number of retries

##### tns-test

Test Timer (Tns-test) timeout

##### tns-alive

Alive Timer (Tns-alive) timeout

##### tns-alive-retries

Alive Timer (Tns-alive) number of retries

##### tsns-prov

SNS Provision Timer (Tsns-prov) timeout

##### tsns-size-retries

SNS Size number of retries

##### tsns-config-retries

SNS Config number of retries

##### tsns-procedures-retries

SNS Procedures number of retries

##### <0-65535>

Timer Value

## 1.8.8 txqueue-max-length <1-4096>

### Command

```
txqueue-max-length <1-4096>
```

### Parameters

#### txqueue-max-length

Set the maximum length of the txqueue (for UDP)

<1-4096>

Maximum length of the txqueue

## 1.9 config-ctrl

### 1.9.1 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

## 1.10 config-cpu-sched

### 1.10.1 cpu-affinity (self|all|<0-4294967295>|THREADNAME) CPUHEXMASK [delay]

### Command

```
cpu-affinity (self|all|<0-4294967295>|THREADNAME) CPUHEXMASK [delay]
```

### Global attributes

Flag: !

This command applies immediately

### Parameters

---

**cpu-affinity**

Set CPU affinity mask on a (group of) thread(s)

**self**

Set CPU affinity mask on thread running the VTY

**all**

Set CPU affinity mask on all process' threads

**<0-4294967295>**

Set CPU affinity mask on a thread with specified PID

**THREADNAME**

Set CPU affinity mask on a thread with specified thread name

**CPUHEXMASK**

CPU affinity mask

**[delay]**

If set, delay applying the affinity mask now and let the app handle it at a later point

## 1.10.2 policy rr <1-32>

**Command**

```
policy rr <1-32>
```

**Global attributes****Flag: !**

This command applies immediately

**Parameters****policy**

Set the scheduling policy to use for the process

**rr**

Use the SCHED\_RR real-time scheduling algorithm

**<1-32>**

Set the SCHED\_RR real-time priority

## 1.11 config-ns-bind

### 1.11.1 accept-dynamic-ip-sns

**Command**

```
accept-dynamic-ip-sns
```

**Parameters****accept-dynamic-ip-sns**

Allow to create dynamic NS Entities by IP-SNS PDUs

---



### 1.11.2 accept-ipaccess

#### Command

```
accept-ipaccess
```

#### Parameters

##### accept-ipaccess

Allow to create dynamic NS Entity by NS Reset PDU on UDP (ip.access style)

### 1.11.3 dscp <0-63>

#### Command

```
dscp <0-63>
```

#### Parameters

##### dscp

Set DSCP/TOS on the UDP socket

##### <0-63>

DSCP Value

### 1.11.4 fr NETIF (fr|frnet)

#### Command

```
fr NETIF (fr|frnet)
```

#### Parameters

##### fr

frame relay

##### NETIF

Interface name(e.g. ep0)

##### fr

fr (user) is used by BSS or SGSN attached to UNI of a FR network

##### frnet

frnet (network) is used by SGSN if BSS is directly attached

---

### 1.11.5 ip-sns signalling-weight <0-254> data-weight <0-254>

#### Command

```
ip-sns signalling-weight <0-254> data-weight <0-254>
```

#### Parameters

ip-sns

IP SNS

signalling-weight

signalling weight used by IP-SNS dynamic configuration

<0-254>

signalling weight used by IP-SNS dynamic configuration

data-weight

data weight used by IP-SNS dynamic configuration

<0-254>

data weight used by IP-SNS dynamic configuration

### 1.11.6 listen (A.B.C.D|X:X::X:X) <1-65535>

#### Command

```
listen (A.B.C.D|X:X::X:X) <1-65535>
```

#### Parameters

listen

Configure local IP + Port of this bind

A.B.C.D

Local IPv4 Address

X:X::X:X

Local IPv6 Address

<1-65535>

Local UDP Port

### 1.11.7 no accept-dynamic-ip-sns

#### Command

```
no accept-dynamic-ip-sns
```

#### Parameters

no

Negate a command or set its defaults

accept-dynamic-ip-sns

Disable dynamic creation of NS Entities by IP-SNS PDUs

---

### 1.11.8 no accept-ipaccess

#### Command

```
no accept-ipaccess
```

#### Parameters

no

Negate a command or set its defaults

accept-ipaccess

Reject NS Reset PDU on UDP (ip.access style)

### 1.11.9 no dscp

#### Command

```
no dscp
```

#### Parameters

no

Set DSCP/TOS on the UDP socket

dscp

DSCP Value

### 1.11.10 no fr NETIF

#### Command

```
no fr NETIF
```

#### Parameters

no

Negate a command or set its defaults

fr

Delete a frame relay link

NETIF

Delete a frame relay link

---

### 1.11.11 no listen

#### Command

```
no listen
```

#### Parameters

no

Negate a command or set its defaults

listen

Delete a IP/Port assignment

### 1.11.12 socket-priority <0-255>

#### Command

```
socket-priority <0-255>
```

#### Parameters

socket-priority

Set socket priority on the UDP socket

<0-255>

Priority Value (>6 requires CAP\_NET\_ADMIN)

## 1.12 config-ns-nse

### 1.12.1 ip-sns-bind BINDID

#### Command

```
ip-sns-bind BINDID
```

#### Parameters

ip-sns-bind

IP SNS binds

BINDID

Name of NS udp bind whose IP endpoint will be used as IP-SNS local endpoint. Can be given multiple times.

### 1.12.2 ip-sns-remote (A.B.C.D|X:X::X:X) <1-65535>

#### Command

```
ip-sns-remote (A.B.C.D|X:X::X:X) <1-65535>
```

#### Parameters

##### ip-sns-remote

SNS Initial Endpoint

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

SGSN IPv4 Address

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

SGSN IPv6 Address

##### <1-65535>

SGSN UDP Port

### 1.12.3 no ip-sns-bind BINDID

#### Command

```
no ip-sns-bind BINDID
```

#### Parameters

##### no

Negate a command or set its defaults

##### ip-sns-bind

IP SNS binds

##### BINDID

Name of NS udp bind whose IP endpoint will not be used as IP-SNS local endpoint

### 1.12.4 no ip-sns-remote (A.B.C.D|X:X::X:X) <1-65535>

#### Command

```
no ip-sns-remote (A.B.C.D|X:X::X:X) <1-65535>
```

#### Parameters

##### no

Negate a command or set its defaults

##### ip-sns-remote

Delete a SNS Initial Endpoint

---

A.B.C.D

SGSN IPv4 Address

X:X::X:X

SGSN IPv6 Address

<1-65535>

SGSN UDP Port

### 1.12.5 no nsvc fr NETIF dlci <16-1007>

Command

```
no nsvc fr NETIF dlci <16-1007>
```

Parameters

no

Negate a command or set its defaults

nsvc

Delete frame relay NS-VC

fr

frame relay

NETIF

frame relay interface. Must be registered via fr vty

dlci

Data Link connection identifier

<16-1007>

Data Link connection identifier

### 1.12.6 no nsvc ipa BIND (A.B.C.D|X:X::X:X) <1-65535> nsvci <0-65535>

Command

```
no nsvc ipa BIND (A.B.C.D|X:X::X:X) <1-65535> nsvci <0-65535>
```

Parameters

no

Negate a command or set its defaults

nsvc

Delete a NS Virtual Connection

ipa

NS over UDP

**BIND**

A unique bind identifier created by ns bind

**A.B.C.D**

Remote IPv4 Address

**X:X::X:X**

Remote IPv6 Address

**<1-65535>**

Remote UDP Port

**nsvc**

NS Virtual Connection ID (NS-VCI)

**<0-65535>**

NS Virtual Connection ID (NS-VCI)

**1.12.7 no nsvc nsvc <0-65535>****Command**

```
no nsvc nsvc <0-65535>
```

**Parameters****no**

Negate a command or set its defaults

**nsvc**

Delete NSVC

**nsvc**

NS Virtual Connection ID (NS-VCI)

**<0-65535>**

NS Virtual Connection ID (NS-VCI)

**1.12.8 no nsvc udp BIND (A.B.C.D|X:X::X:X) <1-65535>****Command**

```
no nsvc udp BIND (A.B.C.D|X:X::X:X) <1-65535>
```

**Parameters****no**

Negate a command or set its defaults

**nsvc**

Delete a NS Virtual Connection

udp

NS over UDP

BIND

A unique bind identifier created by ns bind

A.B.C.D

Remote IPv4 Address

X:X::X:X

Remote IPv6 Address

<1-65535>

Remote UDP Port

### 1.12.9 nsvc fr NETIF dlci <16-1007> nsvci <0-65535>

Command

```
nsvc fr NETIF dlci <16-1007> nsvci <0-65535>
```

Parameters

nsvc

NS Virtual Connection

fr

frame relay

NETIF

frame relay interface. Must be registered via fr vty

dlci

NS Virtual Connection ID (NS-VCI)

<16-1007>

NS Virtual Connection ID (NS-VCI)

nsvci

Data Link connection identifier

<0-65535>

Data Link connection identifier

### 1.12.10 nsvc ipa BIND (A.B.C.D|X:X::X:X) <1-65535> nsvci <0-65535>

Command

```
nsvc ipa BIND (A.B.C.D|X:X::X:X) <1-65535> nsvci <0-65535>
```

Parameters

---



nsvc

NS Virtual Connection

ipa

NS over UDP ip.access style (uses RESET/BLOCK)

BIND

A unique bind identifier created by ns bind

A.B.C.D

Remote IPv4 Address

X:X::X:X

Remote IPv6 Address

<1-65535>

Remote UDP Port

nsvci

NS Virtual Connection ID (NS-VCI)

<0-65535>

NS Virtual Connection ID (NS-VCI)

### 1.12.11 nsvc udp BIND (A.B.C.D|X:X::X:X) <1-65535>

Command

```
nsvc udp BIND (A.B.C.D|X:X::X:X) <1-65535>
```

Parameters

nsvc

NS Virtual Connection

udp

NS over UDP

BIND

A unique bind identifier created by ns bind

A.B.C.D

Remote IPv4 Address

X:X::X:X

Remote IPv6 Address

<1-65535>

Remote UDP Port

### 1.12.12 nsvc udp BIND (A.B.C.D|X:X::X:X) <1-65535> signalling-weight <0-254> data-weight...

#### Command

```
nsvc udp BIND (A.B.C.D|X:X::X:X) <1-65535> signalling-weight <0-254> data-weight <0-254>
```

#### Parameters

##### nsvc

NS Virtual Connection

##### udp

NS over UDP

##### BIND

A unique bind identifier created by ns bind

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

Remote IPv4 Address

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

Remote IPv6 Address

##### <1-65535>

Remote UDP Port

##### signalling-weight

Signalling weight of the NSVC (default = 1)

##### <0-254>

Signalling weight of the NSVC (default = 1)

##### data-weight

Data weight of the NSVC (default = 1)

##### <0-254>

Data weight of the NSVC (default = 1)

## 1.13 config-gbproxy

Configure the Gb proxy

### 1.13.1 nri bitlen <0-15>

#### Command

```
nri bitlen <0-15>
```

#### Global attributes

---

Flag: !

This command applies immediately

#### Parameters

nri

Mapping of Network Resource Indicators to this SGSN, for SGSN 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).

<0-15>

bit count (0 disables) pooling)

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

#### Command

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

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

nri

Mapping of Network Resource Indicators to this SGSN, for SGSN pooling

null

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

---

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

#### Command

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

#### Global attributes

Flag: !

This command applies immediately

#### Parameters

nri

Mapping of Network Resource Indicators to this SGSN, for SGSN pooling

null

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

del

Remove 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.

### 1.13.4 pool bvc-flow-control-ratio <1-100>

#### Command

```
pool bvc-flow-control-ratio <1-100>
```

#### Parameters

pool

SGSN Pool related configuration

bvc-flow-control-ratio

Ratio of BSS-advertised bucket size + leak rate advertised to each SGSN

<1-100>

Ratio of BSS-advertised bucket size + leak rate advertised to each SGSN (Percent)

## 1.14 config-sgsn

### 1.14.1 allow-attach

Command

```
allow-attach
```

Global attributes

Flag: !

This command applies immediately

Parameters

allow-attach

Allow this SGSN to attach new subscribers (default).

### 1.14.2 name NAME

Command

```
name NAME
```

Parameters

name

Configure the SGSN

NAME

Name the SGSN

### 1.14.3 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 SGSN. Useful if an SGSN in an SGSN pool is configured to off-load subscribers. The SGSN will still be operational for already IMSI-Attached subscribers, but the NAS node selection function will skip this SGSN for new subscribers

### 1.14.4 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 SGSN, for SGSN pooling

add

Add NRI value or range to the NRI mapping for this SGSN

<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.

### 1.14.5 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 SGSN, for SGSN pooling

del

Remove NRI value or range from the NRI mapping for this SGSN

<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.

---