
L2TP Network Server Commands

Generic Commands

description

Syntax	description <i>description-string</i> no description
Context	config>isa>>Ins-group
Description	This command creates a text description which is stored in the configuration file to help identify the content of the entity. The no form of the command removes the string from the configuration.
Default	none
Parameters	<i>string</i> — The description character string. Allowed values are any string composed of printable, 7-bit ASCII characters. If the string contains special characters (#, \$, spaces, etc.), the entire string must be enclosed within double quotes.

shutdown

Syntax	[no] shutdown
Context	config>isa>Ins-group
Description	This command administratively disables the entity. When disabled, an entity does not change, reset, or remove any configuration settings or statistics. Many entities must be explicitly enabled using the no shutdown command. The shutdown command administratively disables an entity. The operational state of the entity is disabled as well as the operational state of any entities contained within. Many objects must be shut down before they may be deleted.

LNS Commands

Ins-group

Syntax	ins-group <i>ins-group-id</i> [create] no ins-group <i>ins-group-id</i>
Context	config>isa
Description	This command configures an LNS group. The no form of the command removes the LNS group ID from the configuration.
Default	none
Parameters	<i>ins-group-id</i> — Values 1 — 4 create — Mandatory keyword used when creating tunnel group in the ISA context. The create keyword requirement can be enabled/disabled in the environment>create context.

mda

Syntax	mda <i>mda-id</i> [drain] no mda <i>mda-id</i>
Context	config>isa>ins-group
Description	This command configures an L2TP ISA Media Dependent Adapter (MDA) for the L2TP ISA group. The no form of the command removes the MDA ID from the configuration.
Context	none
Parameters	<i>mda-id</i> — Specifies the ISA LNS group MDA. Values <i>mda-id</i> <slot>/<mda> slot 1 — 10 mda 1 — 2 drain — Specifies that this MDA is drained from LNS tunnels.

port-policy

Syntax	port-policy <i>policy-name</i> no port-policy
Context	config>isa>ins-group

Description	<p>This command enables policies referenced in the configure>port-policy context to be created under ports. These are the ports that link the carrier IOM to the ISA, and are hidden within the system (they cannot be created through the CLI). They are created automatically. Use the show port command to view information.</p> <p>Currently only the port scheduler policy is supported. Each lns-esm port in the lns-group receives an independent port scheduler instance. The port schedulers are instantiated in the carrier IOM on the lns-esm ports that carry PPPoE traffic in the downstream direction towards the ISA before the PPPoE traffic is L2TP encapsulated.</p> <p>The no form of the command removes the policy name from the configuration.</p>
Default	none
Parameters	<i>policy-name</i> — specifies the port policy of this LNS group.

port-policy

Syntax	port-policy <i>policy-name</i> no port-policy
Context	config
Description	<p>This command instantiates a port policy manager that applies policies (port scheduler) to be hidden, dynamically created ports for WLAN GW/LNS/NAT.</p> <p>The no form of the command removes the policy name from the configuration.</p>
Default	no port-policy
Parameters	<i>policy-name</i> — specifies the port policy of this LNS group.

egress-scheduler-policy

Syntax\	egress-scheduler-policy <i>port-sched-plcy</i> no egress-scheduler-policy
Context	config>isa>port-policy
Description	<p>This command references a port scheduler policy that is defined under the configure>qos>port-scheduler-policy> hierarchy. Port schedulers are instantiated on carrier IOMs towards all ISAs that are part of the lns-group.</p> <p>The no form of the command removes the port scheduler policy from the configuration.</p>
Default	no egress-scheduler-policy
Parameters	<i>port-sched-plcy</i> — Specifies the the egress scheduler policy up to 32 characters in length.

mda

Syntax	mda <i>mda-id</i> [drain] no mda <i>mda-id</i>									
Context	config>isa>Ins-group									
Description	This command configures an ISA LNS group MDA. The no form of the command removes the MDA ID from the LNS group configuration.									
Parameters	<i>mda-id</i> — <table><tr><td>Values</td><td>mda-id:</td><td><i>slot/mda</i></td></tr><tr><td></td><td></td><td>slot: 1 — 10</td></tr><tr><td></td><td></td><td>mda: 1, 2</td></tr></table> drain — Prevents new L2TP sessions being associated with the ISA. If an ISA is removed from the <i>ins-group</i> or if the <i>ins-group</i> be shutdown all associated L2TP sessions will be immediately terminated (and L2TP CDN messages sent to the L2TP peer). View show commands to determine which ISA is terminating which session (show router l2tp session).	Values	mda-id:	<i>slot/mda</i>			slot: 1 — 10			mda: 1, 2
Values	mda-id:	<i>slot/mda</i>								
		slot: 1 — 10								
		mda: 1, 2								

Network Address Translation (NAT) Commands

nat-group

Syntax	nat-group <i>nat-group-id</i> [create] no nat-group <i>nat-group-id</i>
Context	config>isa
Description	This command configures an ISA NAT group. The no form of the command removes the ID from the configuration.
Default	none
Parameters	<i>nat-group</i> — Specifies the ISA NAT group ID. Values 1 — 4

active-mda-limit

Syntax	active-mda-limit <i>number</i> no active-mda-limit
Context	config>isa
Description	This command configures the ISA NAT group maximum number of MDA. The no form of the command removes the number from the configuration.
Default	none
Parameters	<i>number</i> — Specifies the active MDA limit. Values 1 — 6

mda

Syntax	[no] mda <i>mda-id</i>
Context	config>isa>nat-group
Description	This command configures an ISA NAT group MDA.
Parameters	<i>mda-id</i> — Specifies the MDA ID in the <i>slot/mda</i> format. Values slot: 1 — 10 mda: 1 — 2

session-limits

Syntax	session-limits
Context	config>isa>nat-group
Description	This command configures the ISA NAT group session limits.

reserved

Syntax	reserved <i>num-sessions</i> no reserved
Context	config>isa>nat-group>session-limits
Description	This command configures the number of sessions rper block that will be reserved for prioritized sessions.
Parameters	<i>num-sessions</i> — Specifies the number of sessions reserved for prioritized sessions. Values 0 — 4194303

watermarks

Syntax	watermarks <i>high percentage low percentage</i> no watermarks
Context	config>isa>nat-group>session-limits
Description	This command configures the ISA NAT group watermarks. high percentage — Specifies the high watermark of the number of sessions for each MDA in this NAT ISA group. Values 1 — 100 low percentage — Specifies the low watermark of the number of sessions for each MDA in this NAT ISA group. Values 0 — 99

MLPPP on LNS Commands

accept-mrru

Syntax	[no] accept-mrru
Context	configure>subscr-mgt>ppp-policy>mlppp
Description	<p>This command is applicable only to LAC. MRRU option is an indication that the session is of MLPPPoX type. The 7750 LAC will never initiate MRRU option in LCP negotiation process. However, it will respond to MRRU negotiation request by the client.</p> <p>This command provides an option to specifically enable or disable negotiation of MLPPPoX on a capture SAP level or on a group-interface level.</p>
Default	no accept-mrru — The MRRU option in LCP will not be negotiated by LAC.

admin-state

Syntax	admin-state {up down} no admin-state
Context	configure>router>l2tp>group>tunnel>mlppp configure>service>vpn>l2tp>group>tunnel>mlppp
Description	<p>This command is applicable only to LNS.</p> <p>The tunnel can be explicitly activated (assuming that the parent group is in a no shutdown state) or deactivated by the up and down keywords.</p> <p>If case that there is no admin-state configured, the tunnel will inherit its administrative state from its parent (group).</p>
Default	<p>no admin-state — Tunnel administrative state is inherited from the group.</p> <p>up — Tunnel is in administratively up.</p> <p>down — Tunnel is administratively down.</p>

encap-offset

Syntax	encap-offset [type <i>encap-type</i>] no encap-offset
Context	configure>subscriber-mgmt>local-user-db>ppp>host>access-loop
Description	This command is applicable within the LAC/LNS context. It provides the last mile link encapsulation information that is needed for proper (shaping) rate calculations and interleaving delay in the last mile.

The encapsulation value will be taken from the following sources in the order of priority:

- Statically provisioned value in local user database (LUDB).
- RADIUS
- PPPoE tags on LAC or ICRQ message (RFC 5515) on LNS

In case that the encapsulation information is not provided by any of the existing means (LUDB, RADIUS, AVP signaling, PPPoE Tags), then by default pppoea-null encapsulation will be in effect.

The following values are supported encapsulation values on LNS in the 7750.

encap-type:

```
pppoa-llc LLC (NLPID) PPPoA encapsulation.
pppoa-null VC-MUX PPPoA encapsulation.
pppoeoa-llc LLC/SNAP based bridged Ethernet PPPoEoA encapsulation without FCS.
pppoeoa-llc-fcs LLC/SNAP based bridged Ethernet PPPoEoA encapsulation with FCS.
pppoeoa-null VC-MUX PPPoEoA encapsulation without FCS.
pppoeoa-null-fcs VC-MUX PPPoEoA encapsulation with FCS.
pppoe PPPoE encapsulation.
pppoe-tagged Tagged PPPoE Encapsulation.
```

The values are not supported encapsulation values on LNS in the 7750.

```
pppoeoa-llc-tagged
pppoeoa-llc-tagged-fcs
pppoeoa-null-tagged
pppoeoa-null-tagged-fcs
ipoa-llc
ipoa-null
ipoeoa-llc
ipoeoa-llc-fcs
ipoeoa-llc-tagged
ipoeoa-llc-tagged-fcs
ipoeoa-null
ipoeoa-null-fcs
ipoeoa-null-tagged
ipoeoa-null-tagged-fcs
ipoe
ipoe-tagged
```

Default no encap-offset No offset is configured.

endpoint

Syntax **endpoint ip** *ip-address*
endpoint mac *ieee-address*
endpoint system-ip
endpoint system-mac
no endpoint

Context configure>router>l2tp>group>mlppp
configure>router>l2tp>group>tunnel>mlppp


```
configure>service>vprn>l2tp>group>mlppp
configure>service>vprn>l2tp>group>tunnel>mlppp
configure>subscr-mgt>ppp-policy>mlppp
```

Description	<p>When configured under the l2tp hierarchy, this command is applicable to LNS.</p> <p>Within the ppp-policy, this command is applicable only to LAC.</p> <p>The endpoint, according to RFC 1990, represents the system transmitting the packet. It is used during MLPPPoX negotiation phase to distinguish this peer from all others.</p> <p>In the case that the client rejects the endpoint option during LCP negotiation, the LAC and the LNS must be able to negotiate the LCP session without the endpoint option.</p> <p>The no form of this command disables sending endpoint option in LCP negotiation.</p>
Default	no endpoint
Parameters	<p>ip <i>ip-address</i> — Specifies the IPv4 address (class 2)</p> <p>system-ip — Specifies to use the system IPv4 address (class 2)</p> <p>mac <i>ieee-address</i> — Specifies the MAC address of the interface (class 3).</p> <p>system-mac — Specifies to use the MAC address of the system (class 3)</p>

interleave

Syntax	[no] interleave
Context	<pre>configure>router>l2tp>group>mlppp configure>service>vprn>l2tp>group>mlppp</pre>
Description	<p>This command is applicable only to LNS. Interleaving is supported only on MLPPPoX bundles that contain a single member link. If more than one link is present in the MLPPPoX bundle, interleaving will be automatically disabled and a TRAP/log (tmnxMlpppBundleIndicatorsChange) will be generated.</p> <p>The minimum supported rate of the link on which interleaving is performed is 1kbps.</p> <p>If configured at this level, interleaving will be enabled on all tunnels within the group, unless it is explicitly disable per tunnel.</p>
Default	no interleave — Interleaving per group is disabled.

interleave

Syntax	interleave {always never} no interleave
Context	<pre>configure>router>l2tp>group>tunnel>mlppp configure>service>vprn>l2tp>group>tunnel>mlppp</pre>
Description	<p>This command is applicable only to LNS. Interleaving is supported only on MLPPPoX bundles that contain a single member link. If more than one link is present in the MLPPPoX bundle, interleaving</p>

will be automatically disabled and a TRAP/log (tmnxMlpppBundleIndicatorsChange) will be generated.

The minimum supported rate of the link on which interleaving is performed is 1kbps.

Interleaving configured on this level will overwrite the configuration option under the group hierarchy. If the no form of the command is configured for interleaving at this level, the interleaving configuration will inherit the configuration option configured under the l2tp group.

Default no interleave — Interleaving configuration is inherited from the group.

Parameters **always** — Always perform interleaving on single linked MLPPPoX sessions within this tunnel, regardless of the configuration option for interleaving under the group level.

never — Never perform interleaving on single linked MLPPPoX sessions within this tunnel, regardless of the configuration option for interleaving under the group level.

load-balance-method

Syntax **load-balance-method {session | tunnel}**
no load-balance-method

Context configure>router>l2tp>group
configure>router>l2tp>group>tunnel
configure>service>vprn>l2tp>group
configure>service>vprn>l2tp>group>tunnel

Description This command is applicable only to LNS. By default traffic load balancing between the BB-ISAs is based on sessions. Each session is individually assigned to an BB-ISA during session establishment phase.

By introducing MLPPPoX, all sessions of a bundle must be terminated on the same LNS BB-ISA. This is necessary for two reasons:

- QoS in the carrier IOM has a uniform view of the subscriber
- a single BB-ISA is responsible for MLPPPoX encapsulation/fragmentation for a given bundle.

Therefore, if fragmentation is enabled, load-balancing per tunnel must be configured. In the per tunnel load-balancing mode, all sessions within the same tunnel are terminated on the same LNS BB-ISA.

In the case that we have MLPPPoX sessions with a single member link, both load-balancing methods are valid.

The **no** form of this command set the per session load balancing.

Default session — Per session load balancing is enabled by default.

Parameters **session** — Traffic load balancing between the LNS BB-ISAs is based on individual PPPoE sessions.

tunnel — Traffic load balancing between the LNS BB-ISAs is based on tunnels.

max-fragment-delay

Syntax	max-fragment-delay <i>mili-seconds</i> no max-fragment-delay
Context	configure>router>l2tp>group>mlppp configure>router>l2tp>group>tunnel>mlppp configure>service>vprn>l2tp>group>mlppp configure>service>vprn>l2tp>group>tunnel>mlppp
Description	This command is applicable only to LNS. It determines the maximum fragment delay caused by the transmission that will be imposed on a link. Fragmentation can be used to interleave high priority packet in-between low priority fragments on a MLPPPoX session with a single link or on a MLPPPoX session with multiple links to better load balance traffic over multiple member links.
Default	no max-fragment-delay — Fragmentation is disabled.
Parameters	<i>mili-seconds</i> — Specifies the interval in mili-seconds. Values 5-1000ms

max-link

Syntaxs	max-links <i>max-links</i> no max-links
Context	configure>router>l2tp>group>mlppp configure>router>l2tp>group>tunnel>mlppp configure>service>vprn>l2tp>group>mlppp configure>service>vprn>l2tp>group>tunnel>mlppp
Description	This command is applicable only to LNS. It determines the maximum number of links that can be put in a bundle. Any attempt of a session to join a bundle that is above the max-link limit will be rejected. If interleaving is configured, it is recommended that max-links be set to 1 or a <input type="checkbox"/> <input type="checkbox"/> version of the command is used (no max-links). Both have the same effect. The configuration under the tunnel hierarchy will override the configuration under the group hierarchy. The no form of this command limits the number of links in the bundle to 1.
Default	no max-links — A single link per bundle is allowed.
Parameters	<i>max-links</i> — Specifies the maximum number of links in a bundle. Values 1 — 8

reassembly-timeout

Syntax	reassembly-timeout {{100 1000} milliseconds} no reassembly-timeout
Context	configure>router>l2tp>group>mlppp configure>router>l2tp>group>tunnel>mlppp configure>service>vprn>l2tp>group>mlppp configure>service>vprn>l2tp>group>tunnel>mlppp
Description	This command is applicable only to LNS. It determines the time during which the LNS keeps fragments of the same packet in the buffer before it discards them. The assumption is that if the fragments do not arrive within certain time, the chance is that they were lost somewhere in the network. In this case the partial packet cannot be reassembled and all fragments that has arrived up to this point and are stored in the buffer will be discarded in order to free up the buffer. Otherwise, a condition will arise in which partial packets will be held in the buffer until the buffer is exhausted. The configuration under the tunnel hierarchy will override the configuration under the group hierarchy. The no form of this command also sets the time-out to 1000ms.
Default	1000
Parameters	{{100 1000} milliseconds} — Specifies the reassembly timeout value.

rate-down

Syntax	rate-down <i>rate</i> no rate-down
Context	configure>subscriber-mgmt>local-user-db>ppp>host>access-loop
Description	This command is applicable to LAC and LNS. It provides the last mile link rate in the downstream direction that is needed for proper shaping and calculating the interleaving delay. The rate information in the last mile will be taken from the following sources in the order of priority: <ul style="list-style-type: none"> • Statically provisioned value in local user database (LUDB). • RADIUS. • PPPoE tags on LAC or ICRQ message (RFC 5515) /ICCN message (TX Connect Seed) on LNS.
Default	no rate-down
Parameters	<i>rate</i> — Specifies last mile link downstream rate in the access loop Values 1 — 100000 kbps

short-sequence-numbers

Syntax **[no] short-sequence-numbers**

Context	configure>subscr-mgt>ppp-policy>mlppp
Description	This command enables a peer request to send short sequence numbers. This command is applicable to LAC and LNS. By default, MLPPPoX will negotiate 24bit long sequence numbers. This command allows this to be changed to shorter, 12-bit sequence numbers.
Default	short-sequence-numbers

