DLSw+ Configuration Commands

This chapter describes the commands to configure DLSw+, our implementation of the data-link switching (DLSw) standard. For DLSw+ configuration tasks and examples, refer to the "Configuring DLSw+" chapter of the *Router Products Configuration Guide*. For specific SDLC commands to configure DLSw+ for SDLC, refer to the "LLC2 and SDLC Commands" chapter of the *Router Products Command Reference* publication.

dlsw bgroup-list

Use the **dlsw bgroup-list** global configuration command to map traffic on the local Ethernet bridge group interface to remote peers.

dlsw bgroup-list *list-number* **bgroups** *number*
no dlsw bgroup-list *group-list*

Syntax Description

list-number	The ring list number. This number is subsequently used in the dlsw remote-peer command to define the segment to which the bridge-group belongs
bgroups	The transparent bridge group to which DLSw+ will be attached. The valid range is 1 through 63.
number	The transparent bridge group list number. The valid range is 1 through 255.

Default

There is no default setting.

Command Mode

Global configuration

Usage Guidelines

Traffic received from a remote peer is forwarded only to the bridge group specified in the bridge group list. Traffic received from a local interface is forwarded to peers if the input bridge group number appears in the bridge group list applied to the remote peer definition. The definition of a bridge group list is optional. Since each remote peer has a single list-number associated with it, if you want traffic to go to a bridge group and to either a ring list or port list, you should specify the same list number in each definition

Example

The following example configures bgroup list 1:

```
dlsw bgroup-list 1 bgroups 33
```

Related Command

dlsw bridge-group
dlsw port-list
dlsw ring-list

dlsw bridge-group

Use the **dlsw bridge-group** global configuration command to link DLSw+ to the bridge group of the Ethernet LANs. Use the **no** form of this command to disable the link.

dlsw bridge-group *group-number*
no dlsw bridge-group *group-number*

Syntax Description

group-number	The transparent bridge group to which DLSw+ will be attached. The valid range is 1 through 63.

Default

There is no default setting.

Command Mode

Global configuration

Example

The following example links DLSw+ to bridge-group 1:

```
dlsw bridge-group 1
```

Related Command

dlsw bgroup-list

dlsw disable

Use the **dlsw disable** global configuration command to disable and reenable DLSw+ without altering the configuration.

> **dlsw disable**

Syntax Description

This command has no arguments or keywords.

Default

There is no default setting.

Command Mode

Global configuration

Example

The following example disables and reenables DLSw+:

```
dlsw disable
```

Related Command

show dlsw capabilities

dlsw duplicate-path-bias

Use the **dlsw duplicate-path-bias** global configuration command to specify how DLSw+ handles duplicate paths to the same MAC address or NetBIOS name. Use the **no** form of the command to return to the default (fault-tolerance).

> **dlsw duplicate-path-bias** [**load-balance**]
> **no dlsw duplicate-path-bias** [**load-balance**]

Syntax Description

load-balance	(Optional) Specifies that sessions are load-balanced across duplicate paths.

Default

Fault-tolerance is the default logic used to handle duplicate paths.

Command Mode

Global configuration

Usage Guidelines

A path is either a remote peer or a local port.

In full-tolerance mode, the preferred path is always used unless it is unavailable. The preferred path is either the path over which the first response to an explorer was received, or, in the case of remote peers, the peer with the least cost.

Example

The following example specifies load balancing to resolve duplicate paths.

```
dlsw duplicate-path-bias load balance
```

Related Commands

dlsw remote-peer
show dlsw capabilities

dlsw explorerq-depth

Use the **dlsw explorerq-depth** global configuration command to configure the depth of the DLSw explorer packet processing queue. Use the **no** form of this command to disable the explorer packet processing queue.

> **dlsw explorerq-depth** *queue-max*
> **no dlsw explorerq-depth** *queue-max*

Syntax Description

queue-max	Maximum queue size in packets. The valid range is 25 through 500 packets.

Default

No default queue-max is configured.

Command Mode

Global configuration

Example

The following example sets the explorer packet processing queue to 256:

```
dlsw explorerq-depth 256
```

Related Command

show dlsw capabilities

dlsw icannotreach saps

Use the **dlsw icannotreach saps** global configuration command to configure a list of SAPs not locally reachable by the router. Use the **no** form of this command to remove the list.

dlsw icannotreach saps *sap* [*sap...*]
no dlsw icannotreach saps *sap* [*sap...*]

Syntax Description

sap sap...	Array of SAPs.

Default

No lists are configured.

Command Mode

Global configuration

Usage Guidelines

The **dlsw icannot reach saps** command causes the local router to send a control vector to its peers during the capabilities exchange, which tells the peers not to send canureach messages to the local router for sessions using those DSAPs. (They are DSAPs from the peer's perspective, and SSAPs from the perspective of the devices attached to the local router.) The effect is that devices attached to the peer will not be able to initiate sessions to devices attached to the local router using the listed DSAPs. Devices attached to the local router, however, will still be able to start sessions with devices on its peers using the listed saps as SSAPs. The reason is that the local router can still send canureach requests to its peers, since no filtering is actually done on the local router. The filtering done by the peers does not prohibit the peers from responding to canureach requests from the local router sending the control vector, only sending canureach requests to the local router.

Example

The following example specifies a list of SAPs that are not reachable:

```
dlsw icannotreach saps F0
```

Related Command

show dlsw capabilities

dlsw icanreach

Use the **dlsw icanreach** global configuration command to configure a resource that is locally reachable by this router. Use the **no** form of this command to remove the resource.

> **dlsw icanreach** {**mac-exclusive** | **netbios-exclusive** | **mac-address** *mac-addr* [**mask** *mask*] | **netbios-name** *name*}
> **no dlsw icanreach** {**mac-exclusive** | **netbios-exclusive** | **mac-address** *mac-addr* [**mask** *mask*] | **netbios-name** *name*}

Syntax Description

mac-exclusive	Router can reach only the MAC addresses that are user configured.
netbios-exclusive	Router can reach only the NetBIOS names that are user configured.
mac-address *mac-addr*	Configure a MAC address that this router can locally reach.
mask *mask*	(Optional) MAC address mask in hexadecimal h.h.h. The mask indicates which bits in the MAC address are relevant.
netbios-name *name*	Configure a NetBIOS name that this router can locally reach. Wildcards are allowed. The wildcard is either an asterisk (*) at the end, or a question mark (?) in the middle of the name.

Default

No resources are configured.

Command Mode

Global configuration

Usage Guidelines

This command can be entered at any time. It causes a capabilities exchange to relay the information to all active peers. By specifying resource names or MAC addresses in this command, you can avoid broadcasts from remote peers that are looking for this resource. By specifying "exclusive" you can avoid broadcasts to this router for any resources. For example, you could configure the FEP MAC address or corporate site LAN servers in central site routers to avoid any broadcasts over the WAN for these resources.

Example

The following example indicates that this peer only has information about a single NetBIOS server, and that no peers should send this peer explorers searching for other NetBIOS names:

```
dlsw icanreach netbios-exclusive
dlsw icanreach netbios-name lanserv
```

Related Commands

show dlsw capabilities
show dlsw peers

dlsw local-peer

Use the **dlsw local-peer** global configuration command to define the parameters of the DLSw+ local peer. Use the **no** form of this command to cancel the definitions.

> **dlsw local-peer** [**peer-id** *ip-address*] [**group** *group*] [**border**] [**cost** *cost*]
>   [**lf** *size*] [**keepalive** *seconds*] [**passive**] [**promiscuous**]
> **no dlsw local-peer** [**peer-id** *ip-address*] [**group** *group*] [**border**] [**cost** *cost*]
>   [**lf** *size*] [**keepalive** *seconds*] [**passive**] [**promiscuous**]

Syntax Description

peer-id *ip-address*	(Optional) Local peer IP address; required for FST and TCP.
group *group*	(Optional) Peer group number for this router. The valid range is 1 through 255.
border	(Optional) Enables as a border peer.
cost *cost*	(Optional) Peer cost advertised to remote peers in the capabilities exchange. The valid range is 1 through 5.
lf *size*	(Optional) Largest frame size for this local peer. Valid sizes are the following: 516-516 byte maximum frame size 1470-1470 byte maximum frame size 1500-1500 byte maximum frame size 2052-2052 byte maximum frame size 4472-4472 byte maximum frame size 8144-8144 byte maximum frame size 11407-11407 byte maximum frame size 11454-11454 byte maximum frame size 17800-17800 byte maximum frame size
keepalive *seconds*	(Optional) Default remote peer keepalive interval in seconds. The valid range is 0 through 1200 seconds.
passive	(Optional) Specifies that the router will not initiate remote peer connections to configured peers.
promiscuous	(Optional) Accepts connections from nonconfigured remote peers.

Default

No parameters are defined.

Command Mode

Global configuration

Usage Guidelines

Use the **cost** keyword when there are multiple peers to a given destination, to determine which router is preferred and which is capable. The **cost** keyword only applies in fault tolerance mode.

Example

The following command defines the local peer IP address and specifies the peer group number for this router:

```
dlsw local-peer peer-id 10.2.17.1 group 2
```

Related Commands

dlsw duplicate-path-bias
show dlsw capabilities
show dlsw peers

dlsw mac-addr

Use the **dlsw mac-addr** global configuration command to configure a static MAC address. Use the **no** form of this command to cancel the configuration.

> **dlsw mac-addr** *mac-addr* {**ring-group** *ring* | **remote-peer** {**interface serial**
> *number* | **ip-address** *ip-address*} | **group** *group*}
> **no dlsw mac-addr** *mac-addr* {**ring-group** *ring* | **remote-peer** {**interface serial**
> *number* | **ip-address** *ip-address*} | **group** *group*}

Syntax Description

macaddr	Specifies the MAC address.
ring-group *ring*	Maps the MAC address to a ring number or ring group number. The valid range is 1 through 4095.
remote-peer	Maps the MAC address to a specific remote peer.
interface serial *number*	Specifies the remote peer by direct serial interface.
ip-address *ip-address*	Specifies the remote peer by IP address.
group *group*	Maps the MAC address to a specified peer group. Valid numbers are in the range 1 through 255.

Default

No static MAC address is configured.

Command Mode

Global configuration

Usage Guidelines

You can statically define resources to prevent a router from sending explorer frames for the specified resource. For example, you can include the MAC address of a FEP in the configuration for each remote router to eliminate any broadcasts that are searching for a FEP. Alternatively, you can specify a single **dlsw icanreach** statement in the routers attached to the FEP indicating the MAC address of the FEP. This information is sent to all remote routers as part of the capabilities exchange.

Example

The following example configuration inserts an entry with MAC address 1000.5A12.3456 and a RIF string of 0630.0081.0090 into the RIF cache:

```
dlsw mac-addr 1000.5A12.3456 remote-peer ip-address 10.17.3.2
```

Related Commands

show dlsw capabilities
show dlsw peers

dlsw netbios-name

Use the **dlsw netbios-name** global configuration command to configure a static NetBIOS name. Use the **no** form of this command to cancel the configuration.

> **dlsw netbios-name** *netbios-name* {**ring-group** *ring* | **remote-peer** {**interface**
> **serial** *number* | **ip-address** *ip-address*} | **group** *group*}
> **no dlsw netbios-name** *netbios-name* {**ring-group** *ring* | **remote-peer** {**interface**
> **serial** *number* | **ip-address** *ip-address*} | **group** *group*}

Syntax Description

netbios-name	Specifies the NetBIOS name. Wildcards are allowed.
ring-group *ring*	Maps the NetBIOS name to a ring number or ring group number. Test frames for this name will only be sent to LAN ports in this ring group.
remote-peer	Maps the NetBIOS name to a specific remote peer.
interface serial *number*	Specifies the remote peer by direct interface.
ip-address *ip-address*	Specifies the remote peer by IP address.
group *group*	Maps the NetBIOS name to a specified peer group. Valid numbers are in the range 1 through 255.

Default

No static NetBIOS name is configured.

Command Mode

Global configuration

Example

The following example configures a static NetBIOS name and links it to ring group 3:

```
dlsw netbios-name netname ring-group 3
```

Related Commands

show dlsw capabilities
show dlsw peers

dlsw peer-on-demand-defaults fst

Use the **dlsw peer-on-demand-defaults fst** global configuration command to configure FST for peer-on-demand transport. Use the **no** form of this command to disable the previous assignment.

dlsw peer-on-demand-defaults fst [**bytes-netbios-out** *bytes-list-name* | **cost** *cost* | **host-netbios-out** *host-list-name* | **keepalive** *keepalive* | **lsap-output-list** *access-list-number* | **port-list** *portnumber*]

no dlsw peer-on-demand-defaults fst [**bytes-netbios-out** *bytes-list-name* | **cost** *cost* | **host-netbios-out** *host-list-name* | **keepalive** *keepalive* | **lsap-output-list** *access-list-number* | **port-list** *portnumber*]

Syntax Description

bytes-netbios-out *bytes-list-name*	Configures NetBIOS bytes output filtering for peer-on-demand peers. The *bytes-list-name* is the name of the previously defined netbios bytes access list filter.
cost *cost*	Specifies the cost to reach peer-on-demand peers. The valid range is 1 through 5. The default cost is 3.
host-netbios-out *host-list-name*	Configures NetBIOS host output filtering for peer-on-demand peers. The *host-list-name* is the name of the previously defined NetBIOS host access list filter.
inactivity *minutes*	(Optional) Configures the length of time after the peer's circuit count is zero that the peer-on-demand is disconnected. The default is 10 minutes.
keepalive *keepalive*	Configures the peer-on-demand keepalive interval. The valid range is 0 through 1200 seconds. The default is 30 seconds.
lf *size*	(Optional) Largest frame size for this remote peer. Valid sizes are the following: 516-516 byte maximum frame size 1470-1470 byte maximum frame size 1500-1500 byte maximum frame size 2052-2052 byte maximum frame size 4472-4472 byte maximum frame size 8144-8144 byte maximum frame size 11407-11407 byte maximum frame size 11454-11454 byte maximum frame size 17800-17800 byte maximum frame size
lsap-output-list *access-list-number*	Configures LSAP output filtering for peer-on-demand peers. Valid numbers are in the range 200 through 299.
port-list *portlistnumber*	Configures a port list for peer-on-demand peers. Valid numbers are in the range 0 through 4095.

Default

The default peer-on-demand transport is TCP.

Command Mode

Global configuration

Example

The following example configures FST for peer-on-demand transport:

```
dlsw peer-on-demand-defaults fst
```

Related Commands

show dlsw capabilities
show dlsw peers

dlsw peer-on-demand-defaults tcp

Use the **dlsw peer-on-demand-defaults tcp** global configuration command to configure TCP for peer-on-demand transport. Use the **no** form of this command to disable the previous assignment.

> **dlsw peer-on-demand-defaults tcp** [**bytes-netbios-out** *bytes-list-name* | **cost** *cost* | **host-netbios-out** *host-list-name* | **keepalive** *seconds* | **local-ack** | **lsap-output-list** *accesslistnumber* | **port-list** *portnumber* | **priority**]
> **no dlsw peer-on-demand-defaults tcp** [**bytes-netbios-out** *bytes-list-name* | **cost** *cost* | **host-netbios-out** *host-list-name* | **keepalive** *seconds* | **local-ack** | **lsap-output-list** *accesslistnumber* | **port-list** *portnumber* | **priority**]

Syntax Description

bytes-netbios-out *bytes-list-name*	Configures NetBIOS bytes output filtering for peer-on-demand peers. The bytes-list-name is the name of the previously defined netbios bytes access list filter.
cost *cost*	Specifies the cost to reach peer-on-demand peers. The valid range is 1 through 5. The default cost is 3.
host-netbios-out *host-list-name*	Configures netbios host output filtering for peer-on-demand peers. Host-list-name is the name of the previously defined netbios host access list filter.
inactivity *minutes*	(Optional) Configures the length of time after the peer's circuit count is zero that the peer-on-demand is disconnected. The default is 10 minutes.
keepalive *seconds*	Configures the peer-on-demand keepalive interval. The valid range is 0 through 1200 seconds. The default is 30 seconds.
lf *size*	(Optional) Largest frame size for this remote peer. Valid sizes are the following: 516-516 byte maximum frame size 1470-1470 byte maximum frame size 1500-1500 byte maximum frame size 2052-2052 byte maximum frame size 4472-4472 byte maximum frame size 8144-8144 byte maximum frame size 11407-11407 byte maximum frame size 11454-11454 byte maximum frame size 17800-17800 byte maximum frame size
local-ack	Configures local acknowledgment for peer-on-demand sessions.
lsap-output-list *accesslistnumber*	Configures local SAP (LSAP) output filtering for peer-on-demand peers. Valid numbers are in the range 200 through 299.
port-list *portlistnumber*	Configures a port-list for peer-on-demand peers. Valid numbers are in the range 0 through 4095.
priority	Configures prioritization for peer-on-demand peers. The default state is off.

Default

The default peer-on-demand transport is TCP.

Command Mode

Global configuration

Example

The following example configures TCP for peer-on-demand transport:

```
dlsw peer-on-demand-defaults tcp
```

Related Commands

show dlsw capabilities
show dlsw peers

dlsw port-list

Use the **dlsw port-list** global configuration command to map traffic on a local interface (either Token ring or serial) to remote peers. Use the **no** form of this command to disable the previous map assignment.

> **dlsw port-list** *list-number* [serial \ tokenring] *number* [serial | tokenring] *number*
> **no dlsw port-list** *list-number* [serial \ tokenring] *number* [serial | tokenring] *number*

Syntax Description

list-number	Port list number. The valid range is 1 through 255.
serial | tokenring	The interface type, indicated by the keyword **serial** or **tokenring**.
number	The interface number.

Default

No port list is configured.

Command Mode

Global configuration

Usage Guidelines

Traffic received from a remote peer is forwarded only to the ports specified in the port list. Traffic received from a local interface is forwarded to peers if the input port number appears in the port list applied to the remote peer definition. The definition of a port list is optional.

Example

The following example configures a DLSw peer port list for Ethernet 1 interface:

```
dlsw port-list 3 ethernet 1
```

Related Commands

dlsw bgroup-list
dlsw ring-list

dlsw remote-peer frame relay

Use the **dlsw remote-peer frame relay** global configuration command to specify the remote peer with which the router will connect. Use the **no** form of this command to disable the previous assignments.

dlsw remote-peer *list-number* **frame-relay interface serial** *number dlci-number* [**pass-thru**] [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*] [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out** *bytes-list-name*]

no dlsw remote-peer *list-number* **frame-relay interface** *number dlci-number* [**pass-thru**] [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*] [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out** *bytes-list-name*]

Syntax Description

list-number	Ring list number. The valid range is 1 through 255. The default is 0, which means DLSw+ forwards explorers over all ports or bridge groups on which DLSw+ is enabled.
interface serial *number*	The serial interface number of the remote peer with which the router is to communicate.
dlci-number	The DLCI number of the remote peer.
pass-thru	(Optional) Passthrough mode is selected. (The default, if nothing is specified, is Local Acknowledgment mode.)
cost *cost*	(Optional) Cost to reach this remote peer. The valid range is 1 through 5.
lf *size*	(Optional) Largest frame size for this local peer. Valid sizes are the following: 516-516 byte maximum frame size 1470-1470 byte maximum frame size 1500-1500 byte maximum frame size 2052-2052 byte maximum frame size 4472-4472 byte maximum frame size 8144-8144 byte maximum frame size 11407-11407 byte maximum frame size 11454-11454 byte maximum frame size 17800-17800 byte maximum frame size
keepalive *seconds*	(Optional) Sets the keepalive interval for this remote peer. The range is 0 through 1200 seconds.
lsap-output-list *list*	(Optional) Filters output IEEE 802.5 encapsulated packets. Valid access list numbers are in the range 200 through 299.
host-netbios-out *host-list-name*	(Optional) Configures NetBIOS host output filtering for this peer. The *host-list-name* is the name of the previously defined NetBIOS host access list filter.

bytes-netbios-out *bytes-list-name*   (Optional) Configures NetBIOS bytes output filtering for this peer. The bytes-list-name is the name of the previously defined NetBIOS bytes access list filter.

Default

Command Mode
Global configuration

Usage Guidelines
The **cost** keyword specified in a remote peer statement takes precedence over the cost learned as part of the capabilities exchange with the remote peer. The **cost** keyword is relevant only in fault tolerance mode.

Example
The following example specifies an FST encapsulation connection for remote peer transport:

```
dlsw remote-peer 1 fst 10.2.17.8
```

Related Command
dlsw local-peer
show dlsw capabilities
show dlsw peers

dlsw remote-peer fst

Use the **dlsw remote-peer fst** global configuration command to specify a Fast-Sequenced Transport (FST) encapsulation connection for remote peer transport. Use the **no** form of this command to disable the previous assignments.

> **dlsw remote-peer** *list-number* **fst** *ip-address* [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*]
> [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out**
> *bytes-list-name*] [**backup-peer** *ip-address*]
> **no dlsw remote-peer** *list-number* **fst** *ip-address* [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*]
> [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out**
> *bytes-list-name*] [**backup-peer** *ip-address*]

Syntax Description

list-number	Ring list number. The valid range is 1 through 255. The default is 0, which means DLSw+ forwards explorers over all ports or bridge groups on which DLSw+ is enabled.
fst *ip-address*	IP address of the remote peer with which the router is to communicate.
cost *cost*	(Optional) Cost to reach this remote peer. The valid range is 1 through 5.
lf *size*	(Optional) Largest frame size for this local peer. Valid sizes are the following: 516-516 byte maximum frame size 1470-1470 byte maximum frame size 1500-1500 byte maximum frame size 2052-2052 byte maximum frame size 4472-4472 byte maximum frame size 8144-8144 byte maximum frame size 11407-11407 byte maximum frame size 11454-11454 byte maximum frame size 17800-17800 byte maximum frame size
keepalive *seconds*	(Optional) Sets the keepalive interval for this remote peer. The range is 0 through 1200 seconds.
lsap-output-list *list*	(Optional) Filters output IEEE 802.5 encapsulated packets. Valid access list numbers are in the range 200 through 299.
host-netbios-out *host-list-name*	(Optional) Configures NetBIOS host output filtering for this peer. The *host-list-name* is the name of the previously defined NetBIOS host access list filter.
bytes-netbios-out *bytes-list-name*	(Optional) Configures NetBIOS bytes output filtering for this peer. The bytes-list-name is the name of the previously defined NetBIOS bytes access list filter.
backup-peer *ip-address*	(Optional) Configures a backup to an existing TCP/FST peer.

Default

No FST encapsulation connection is specified.

Command Mode

Global configuration

Usage Guidelines

The **cost** keyword specified in a remote peer statement takes precedence over the cost learned as part of the capabilities exchange with the remote peer. The **cost** keyword is relevant only in fault tolerance mode.

Example

The following example specifies an FST encapsulation connection for remote peer transport:

```
dlsw remote-peer 1 fst 10.2.17.8
```

Related Command

dlsw local-peer
show dlsw capabilities
show dlsw peers

dlsw remote-peer interface

Use the **dlsw remote-peer interface** global configuration command when specifying a point-to-point direct encapsulation connection. Use the **no** form of this command to disable previous interface assignments.

dlsw remote-peer *list-number* **interface serial** *number* [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*] [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out** *bytes-list-name*] [**backup-peer** *ip-address*]

no dlsw remote-peer *list-number* **interface serial** *number* [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*] [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out** *bytes-list-name*] [**backup-peer** *ip-address*]

Syntax Description

list-number	Ring list number. The valid range is 1 through 255 The default is 0, which means all.
interface serial *number*	Specifies the remote peer by direct serial interface.
cost *cost*	(Optional) Cost to reach this remote peer. The valid range is 1 through 5.
lf *size*	(Optional) Largest frame size for this remote peer. Valid sizes are the following: 516-516 byte maximum frame size 1470-1470 byte maximum frame size 1500-1500 byte maximum frame size 2052-2052 byte maximum frame size 4472-4472 byte maximum frame size 8144-8144 byte maximum frame size 11407-11407 byte maximum frame size 11454-11454 byte maximum frame size 17800-17800 byte maximum frame size
keepalive *seconds*	(Optional) Sets the keepalive interval for this remote peer. The range is 0 through 1200 seconds.
lsap-output-list *list*	(Optional) Filters output IEEE 802.5 encapsulated packets. Valid access list numbers are in the range 200 through 299.
host-netbios-out *host-list-name*	(Optional) Configures NetBIOS host output filtering for this peer. The *host-list-name* is the name of the previously defined NetBIOS host access list filter.
bytes-netbios-out *bytes-list-name*	(Optional) Configures NetBIOS bytes output filtering for this peer. The bytes-list-name is the name of the previously defined NetBIOS bytes access list filter.
backup-peer *ipaddress*	(Optional) Configures a backup to an existing peer.

Default

No point-to-point direct encapsulation connection is specified.

Command Mode

Global configuration

Usage Guidelines

The **cost** keyword specified in a remote peer statement takes precedence over the cost learned as part of the capabilities exchange with the remote peer. The **cost** keyword is relevant only in fault tolerance mode.

Example

The following example specifies a point-to-point direct encapsulation connection for remote peer transport:

```
dlsw remote-peer 1 interface serial 2
```

Related Commands

show dlsw peers
show interfaces

dlsw remote-peer tcp

Use th**e dlsw remote-peer tcp** global configuration command to identify the IP address of a peer with which to exchange traffic using TCP. Use the **no** form of this command to remove a remote peer.

dlsw remote-peer *list-number* **tcp** *ip-address* [**priority**]
    [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*] [**tcp-queue-max** *size*]
    [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out**
    bytes-list-name] [**backup-peer** *ip-address*]
no dlsw remote-peer *list-number* **tcp** *ip-address* [**priority**]
    [**cost** *cost*] [**lf** *size*] [**keepalive** *seconds*] [**tcp-queue-max** *size*]
    [**lsap-output-list** *list*] [**host-netbios-out** *host-list-name*] [**bytes-netbios-out**
    bytes-list-name] [**backup-peer** *ip-address*]

Syntax Description

list-number	Remote peer ring group list number. This ring group list number default is 0. Otherwise, this value must match the number you specify with the **dlsw ring-list, dlsw port-list** or **dlsw bgroup-list** command.
tcp *ip-address*	IP address of the remote peer with which the router is to communicate.
priority	Enables prioritization features for this remote peer.
cost *cost*	(Optional) The cost to reach this remote peer. The valid range is 1 through 5.
lf *size*	(Optional) Largest frame size for this remote peer. Valid sizes are the following: 516-516 byte maximum frame size 1470-1470 byte maximum frame size 1500-1500 byte maximum frame size 2052-2052 byte maximum frame size 4472-4472 byte maximum frame size 8144-8144 byte maximum frame size 11407-11407 byte maximum frame size 11454-11454 byte maximum frame size 17800-17800 byte maximum frame size
keepalive *seconds*	(Optional) Sets the keepalive interval for this remote peer. The range is 0 through 1200 seconds.
tcp-queue-max *size*	Maximum output TCP queue size for this remote peer. The valid maximum TCP queue size is a number in the range 10 through 2000.
lsap-output-list *list*	(Optional) Filters output IEEE 802.5 encapsulated packets. Valid access list numbers are in the range 200 through 299.
host-netbios-out *host-list-name*	(Optional) Configures NetBIOS host output filtering for this peer. The host-list-name is the name of the previously defined NetBIOS host access list filter.

bytes-netbios-out *bytes-list-name*	(Optional) Configures NetBIOS bytes output filtering for this peer. The bytes-list-name is the name of the previously defined NetBIOS bytes access list filter.
backup-peer *ip-address*	(Optional) Configures a backup to an existing peer.

Default
No peer IP address is identified.

Command Mode
Global configuration

Example
The following example specifies a TCP encapsulation connection for remote peer transport:

```
dlsw remote-peer 1 tcp 10.2.17.8
```

Related Commands
dlsw ring-list
show dlsw capabilities
show dlsw peers

dlsw ring-list

Use the **dlsw ring-list** to configure a ring list, mapping traffic on a local interface to remote peers. Use the **no** form of this command to cancel the definition.

> **dlsw ring-list** *list-number* **rings** *ring-number*
> **no dlsw ring-list** *list-number* **rings** *ring-number*

Syntax Description

list-number	Ring list number. The valid range is 1 through 255.
rings	Specify one or more physical or virtual ring.
ring-number	Physical or virtual ring number. The valid range is 1-4095.

Default

There is no default setting.

Command Mode

Global configuration

Usage Guidelines

Traffic received from a remote peer is forwarded only to the rings specified in the ring list. Traffic received from a local interface is forwarded to peers if the input ring number appears in the ring list applied to the remote peer definition. The definition of a ring list is optional.

Example

The following example configures a DLSw ring list, assigning rings 1, 2, and 3 to ring list 3:

```
dlsw ring-list 3 rings 1 2 3
```

Related Commands

dlsw bgroup-list
dlsw port-list
show dlsw capabilities
show dlsw peers

dlsw timer

Use the **dlsw timer** global configuration command to tune an existing configuration parameter. Use the **no** form of this command to restore the default parameters.

> **dlsw timer** {**icannotreach-block-time** | **netbios-cache-timeout** | **netbios-explorer-timeout** | **netbios-retry-interval** | **netbios-verify-interval** | **sna-cache-timeout** | **sna-explorer-timeout** | **sna-retry-interval** | **sna-verify-interval**} *time*
> **no dlsw timer** {**icannotreach-block-time** | **netbios-cache-timeout** | **netbios-explorer-timeout** | **netbios-retry-interval** | **netbios-verify-interval** | **sna-cache-timeout** | **sna-explorer-timeout** | **sna-retry-interval** | **sna-verify-interval**} *time*

Syntax Description

icannotreach-block-time *time*

Cache life of unreachable resource, during which searches for that resource are blocked. The valid range is 1 through 86400 seconds. The default is 0 (disabled).

netbios-cache-timeout *time*

Cache life of NetBIOS name location for both local and remote reachability cache. The valid range is 1 through 86400 seconds. The default is 16 minutes.

netbios-explorer-timeout *time*

Length of time that this router waits for an explorer response before marking a resource unreachable (LAN and WAN). The valid range is 1 through 86400 seconds. The default is 6 seconds.

netbios-retry-interval *time*

NetBIOS explorer retry interval (LAN only). The valid range is 1 through 86400 seconds. The default is 1 second.

netbios-verify-interval *time*

Interval between the creation of a cache entry and when the entry is marked as stale. If a search request comes in for a stale cache entry, a directed verify query is sent to assure that it still exists. The valid range is 1 through 86400 seconds. The default is 4 minutes.

sna-cache-timeout *time*

Length of time that an SNA MAC/SAP location cache entry exists before it is discarded (local and remote). The valid range is 1 through 86400 seconds. The default is 16 minutes.

sna-explorer-timeout *time*

Length of time that this router waits for an explorer response before marking a resource unreachable (LAN and WAN). The valid range is 1 through 86400 seconds. The default is 3 minutes.

sna-retry-interval *time*

Interval between SNA explorer retries (LAN). The valid range is 1 through 86400 seconds. The default is 30 seconds.

sna-verify-interval *time*	Interval between the creation of a cache entry and when the entry is marked as stale. If a search request comes in for a stale cache entry, a directed verify query is sent to assure that it still exists. The valid range is 1 through 86400 seconds. The default is 4 minutes.

Command Mode

Global configuration

Example

The following example configures the length of time that an SNA MAC/SAP location cache entry exists before it is discarded:

```
dlsw timer sna-cache-timeout 3
```

sdlc dlsw

Use the **sdlc dlsw** interface configuration command to attach sdlc addresses to DLSw+. Use the **no** form of this command to cancel the configuration.

sdlc dlsw *sdlc-address sdlc-address*
no sdlc dlsw *sdlc-address sdlc-address*

Syntax Description

sdlc-address	SDLC address in hexadecimal. The valid range is 1 through FE.

Default

No correspondence is defined.

Command Mode

Interface configuration

Example

The following command attaches SDLC address d2 to DLSw+:

```
sdlc dlsw d2
```

Related Commands

encapsulation sdlc
sdlc address
sdlc role

show dlsw capabilities

Use the **show dlsw capabilities** privileged EXEC command to display the configuration of the peer specified or of all peers.

> **show dlsw capabilities** [**interface** {*type number*} | **ip-address** *ip-address* | **local**]

Syntax Description

interface *type*	(Optional) The interface type is indicated by the keyword **ethernet**, **null**, **serial**, or **tokenring**.
number	(Optional) The interface number.
ip-address *ip-address*	(Optional) Specifies a remote peer by its IP address.
local	(Optional) Specifies the local DLSw peer.

Command Mode

Privileged EXEC

Sample Display

The following is sample output from the **show dlsw capabilities** command:

```
Flounder#show dlsw capabilities
DLSw: Capabilities for peer 10.2.17.7(2065)
  vendor id (OUI)        : '00C' (cisco)
  version number         : 1
  release number         : 0
  init pacing window     : 10
  unsupported saps       : none
  num of tcp sessions    : 1
  loop prevent support   : no
  icanreach mac-exclusive : no
  icanreach netbios-excl. : no
  reachable mac addresses : none
  reachable netbios names : none
  cisco version number   : 1
  local-ack capable      : yes
  priority capable       : no
  peer group number      : 10
  border peer capable    : yes
  peer cost              : 3
  border peer for group 10 : peer 10.2.17.7(2065) cost 3
  version string         :
```

Table 30-1 describes significant fields shown in the display.

Table 30-1   Show DLSw Capabilities Field Descriptions

Field	Description
vendor id (OUI)	Vendor ID is cisco
version number	DLSw Version Number = 1
release number	Release = 0

Field	Description
init pacing window	Initial Pacing Window = 10
unsupported saps	Unsupported Saps = 0
num of tcp sessions	Number of TCP session = 1
loop prevent support	No Loop Prevent Support no
icanreach mac-exclusive	icanreach mac-exclusive = no
icanreach netbios-excl.	icanreach netbios-exclusive = no
reachable mac address	Reachable MAC Address
reachable netbios name	Reachable Netbios Name
cisco version number	Cisco Version Number = 1
local-ack capable	Local Ack Capable = yes
priority capable	Priority Capability = yes
peer group number	Peer Group Member Number
border peer capable	Border Peer Capability = yes
peer cost	Peer Cost = 3
border peer for group 10	Peer 10.2.17.7 (2065) Cost = 3
version string	

show dlsw circuits

Use the **show dlsw circuit** privileged EXEC command to display the state of all circuits involving this MAC address as a source and destination.

show dlsw circuits

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Sample Display

The following is sample output from the **show dlsw circuit** command:

```
oregon#show dlsw circuits

oregon#show dlsw circuits
Index    local addr(lsap)    remote addr(dsap)  state
4D00    4006.313c.a07f(F0)  0800.5a8f.8822(F0) CONNECTED
        Slot:0 Port:4 Type:ETH peer 10.2.32.1(2065)
7500    4006.313c.a07f(04)  0800.5a8f.8822(04) CONNECTED
        Slot:0 Port:4 Type:ETH peer 10.2.32.1(2065)
```

Table 30-2 describes significant fields shown in the display

Table 30-2   Show DLSw Circuits Field Descriptions

Field	Description
Index	Index = 4D00
local addr (lsap)	Local Address (LSAP) = 4066.313c.a07f (F0)
remote addr (dsap)	Remote Address (DSAP) = 0800.5a8f.8822
state	Connected

show dlsw fastcache

Use the **show dlsw fastcache** privileged EXEC command to display the fast cache for FST and direct-encapsulated peers.

> **show dlsw fastcache**

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Sample Display

The following is sample output from the **show dlsw fastcache** command:

```
oregon#show dlsw fastcache
    peer            local-mac      remote-mac   l/r sap rif
FST 10.2.32.1       0800.5a8f.881c 0800.5a8f.8822  04/04  0680.02D5.1360
```

Table 30-3 describes significant fields shown in the display.

Table 30-3   Show DLSw Fastcache Field Descriptions

Field	Description
peer	Peer = FST 10.2.32.1
local-mac	Local MAC = 0800.5a8f.881c
remote-mac	Remote MAC = 0800.5a8f.8822
l/r sap	Local/Remote SAP 4/4
rif	RIF 0680.02D5.1360

show dlsw peers

Use the **show dlsw peers** privileged EXEC command to display DLSw peer information.

> **show dlsw peers** [**interface** {**ethernet** *number* | **null** *number* | **serial** *number* | **tokenring** *number*} | **ip-address** *ip-address*]

Syntax Description

interface {**ethernet** *number*	**null** *number*	**serial** *number*	**tokenring** *number*}	(Optional) Specifies a remote peer by a direct interface.
ip-address *ip-address*	(Optional) Specifies a remote peer by its IP address.

Command Mode

Privileged EXEC

Sample Display

The following is sample output from the **show dlsw peers** command:

```
oregon#show dlsw peers ip-address 10.2.32.1
Peers:               state  rg_lst  pkts_rx  pkts_tx  type  drops group border
 TCP 10.2.32.1       CONNECT     0    79170    50816  conf      0     0    no
```

Table 30-4 describes significant fields shown in the display.

Table 30-4   Show DLSw Peers Field Descriptions

Peers	Information related to the remote peer, including encapsulation type, IP address (if using FST, TCP), and interface number (if using direct encapsulation.)
state	State of the peer: CONNECT: normal working peer DISCONN: peer is not connected CAP_EXG: capabilities exchange mode. Waiting for capabilities response. WAIT_RD: TCP write pipe (local port 2065) is open and peer is waiting for remote peer to open the read port (local port 2067). This field applies only to TCP peers. WAN_BUSY: Tcp outbound queue is full. This field applies only to TCP peers.
p_lst	Port list number. The default is 0. The possible range is 1 through 255. The p_lst number can be used on port, ring, and bgroup lists. The number is the means by which all 3 lists are associated
pkts_rx	Number of received packets.
pkts_tx	Number of transmitted packets.
type	conf : configuration prom : promiscuous pod : peer on demand

drops	Reasons for the counter to increment: Wan interface not being up for a direct peer. Dlsw tries to send a pak before the peer is fully connected (waiting for TCP event or capabilities event). Outbound tcp queue full FST sequence number count mismatch Can't get buffer to "slow switch" FST packet Cbus controller failure on high end (can't move packet from receive buffer to transmit buffer, or vice versa) Destination ip address of fst packet does not match local peer-id Wan interface not being up for an fst peer No srb route cache command configured Madge ring buffer is full on low end systems (wan feeding lan too fast)
group	Peer group number. Valid range is 1 to 255.
border	YES = border peer capable NO = Not a border peer

show dlsw reachability

Use the **show dlsw reachability** privileged EXEC command to display DLSw reachability information.

show dlsw reachability

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

Sample Display

The following is sample output from the **show dlsw reachability** command:

```
oregon#show dlsw reachability
DLSw MAC address reachability cache list
Mac Addr          status     Loc.     peer/port      rif
0000.f62e.6366    FOUND      LOCAL    P000-S001      06B0.1F41.7D00
0004.f5d9.fa27    FOUND      LOCAL    P000-S001      0A90.00B2.0321.1F41.7D00
0800.5a30.7a9b    FOUND      REMOTE   150.150.10.1(2065)

DLSw NetBIOS Name reachability cache list
NetBIOS Name      status     Loc.     peer/port      rif
EMILY             FOUND      LOCAL    P000-S001      06B0.1F41.7D00
ROSE              FOUND      REMOTE   150.150.10.1(2065)
```

Table 30-5 describes significant fields shown in the display.

Table 30-5   Show DLSw Reachability Field Descriptions

Field	Description
Mac Addr	Mac address of station being sought.(Destination MAC address of canureach_ex packet)
status	Result of search: FOUND SEARCHING: NOT_FOUND: Negative caching is on, and the station has not responded to queries. UNCONFIRMED: Station configured, but DLSw has not had a chance to verify it VERIFY: verifying cache information, either because cache going stale, or verifying user configuration. entry.
loc	Location of station: LOCAL: On the local network REMOTE: On the remote network

Field	Description
peer/port	Peer/Port Number If the Location is REMOTE, this denotes the peer through which the station was found to be reachable. If the station is LOCAL, this denotes the port through which this station was found to be reachable. For ports, the port number and slot number are given. "Pxxx-Syyy" denotes port xxx slot yyy. If the station is reachable through a bridge group, that is shown by "TBridge-xxx"
rif	Currently this column applies only to LOCAL stations. If the station was reached through some media that does not support rifs (such as SDLC or Ethernet) then dlsw shows "--no rif--." Otherwise, the actual rif in the cache is shown.