

Cisco – Configuring Frame Relay DLCI Prioritization

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Configuring Frame Relay DLCI Prioritization

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Introduction

Data-link connection identifier (DLCI) prioritization is the process whereby different traffic types are placed upon separate DLCIs so that a Frame Relay network can provide a different committed information rate for each traffic type. It can be used in conjunction with either custom queuing or priority queuing to provide bandwidth management control over the access link to the Frame Relay network. In addition, some Frame Relay service providers and Frame Relay switches (such as the Stratacom Internetwork Packet Exchange [IPX], IGX and BPX or AXIS switches) actually provide prioritization within the Frame Relay cloud based on this priority setting.

Before You Begin

Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

Prerequisites

There are no specific prerequisites for this document.

Components Used

This document is not restricted to specific software and hardware versions.

The information presented in this document was created from devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If you are working in a live network, ensure that you understand the potential impact of any command before using it.

Implementation Considerations

When implementing DLCI prioritization, please note the following points:

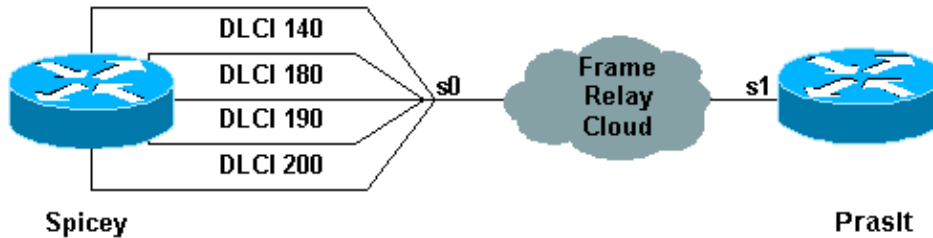
- If a secondary DLCI goes down, you lose traffic destined for that queue only.
- If you lose the primary DLCI, the subinterface goes down and you lose all traffic.

Configure

In this section, you are presented with the information to configure the features described in this document.

Note: To find additional information on the commands used in this document, use the Command Lookup Tool (registered customers only) .

Network Diagram



In order to use this setup, you need to have four DLCIs for the side that will use the DLCI prioritization. In this example, we have configured Spicey for priority queuing as follows:

- Ping is in the high-priority queue.
- Telnet is in the medium-priority queue.
- File Transfer Protocol (FTP) is in the normal-priority queue.
- All other IP traffic is in the low-priority queue.

Note: Make sure you configure the DLCIs to correspond with the priority list, or the system will not use the correct queue.

Configurations

- Spicey
- Prasit

Spicey
<pre>Spicey#show running-config Building configuration... Current configuration : 1955 bytes ! version 12.1 service timestamps debug datetime msec service timestamps log datetime msec ! hostname Spicey ! ! interface Ethernet0 ip address 124.124.124.1 255.255.255.0 ! interface Serial0</pre>

```

no ip address
encapsulation frame-relay
priority-group 1
!
interface Serial0.1 point-to-point
ip address 4.0.1.1 255.255.255.0
frame-relay priority-dlci-group 1 140 180 190 200
frame-relay interface-dlci 140
!
router igrp 2
network 4.0.0.0
network 124.0.0.0
!
access-list 102 permit icmp any any
priority-list 1 protocol ip high list 102
priority-list 1 protocol ip medium tcp telnet
priority-list 1 protocol ip normal tcp ftp
priority-list 1 protocol ip low
!
line con 0
exec-timeout 0 0
transport input none
line aux 0
line vty 0 4
login
!
end

```

Prasit

```

Prasit#show running-config
Building configuration...

!
version 12.1
service timestamps debug datetime msec
service timestamps log datetime msec
!
hostname Prasit
!
!
!
interface Ethernet0
ip address 123.123.123.1 255.255.255.0
!
interface Serial1
ip address 4.0.1.2 255.255.255.0
encapsulation frame-relay
!
router igrp 2
network 4.0.0.0
network 123.0.0.0
!
line con 0
exec-timeout 0 0
transport input none
line aux 0
line vty 0 4
login
!
end

```

Verify

This section provides information you can use to confirm your configuration is working properly.

Certain **show** commands are supported by the Output Interpreter Tool (registered customers only) , which allows you to view an analysis of **show** command output.

- **show frame-relay pvc**
- **show frame-relay map**
- **show queueing priority**
- **debug priority**

Spicey

```
Spicey#show frame-relay pvc
```

```
PVC Statistics for interface Serial0 (Frame Relay DTE)
```

	Active	Inactive	Deleted	Static
Local	4	0	0	0
Switched	0	0	0	0
Unused	0	0	0	0

```
DLCI = 140, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0.1
```

```
input pkts 106          output pkts 15          in bytes 6801
out bytes 1560          dropped pkts 0          in FECN pkts 0
in BECN pkts 0          out FECN pkts 0        out BECN pkts 0
in DE pkts 0            out DE pkts 0
out bcast pkts 0        out bcast bytes 0
pvc create time 00:29:22, last time pvc status changed 00:20:37
Priority DLCI Group 1, DLCI 140 (HIGH), DLCI 180 (MEDIUM)
DLCI 190 (NORMAL), DLCI 200 (LOW)
```

```
DLCI = 180, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0.1
```

```
input pkts 0            output pkts 51          in bytes 0
out bytes 2434          dropped pkts 0          in FECN pkts 0
in BECN pkts 0          out FECN pkts 0        out BECN pkts 0
in DE pkts 0            out DE pkts 0
out bcast pkts 0        out bcast bytes 0
pvc create time 00:29:23, last time pvc status changed 00:14:48
```

```
DLCI = 190, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0.1
```

```
input pkts 0            output pkts 13          in bytes 0
out bytes 3653          dropped pkts 0          in FECN pkts 0
in BECN pkts 0          out FECN pkts 0        out BECN pkts 0
in DE pkts 0            out DE pkts 0
out bcast pkts 13      out bcast bytes 3653
pvc create time 00:29:23, last time pvc status changed 00:14:28
```

```
DLCI = 200, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial0.1
```

```
input pkts 0            output pkts 42          in bytes 0
out bytes 2554          dropped pkts 0          in FECN pkts 0
in BECN pkts 0          out FECN pkts 0        out BECN pkts 0
in DE pkts 0            out DE pkts 0
out bcast pkts 10      out bcast bytes 500
pvc create time 00:29:24, last time pvc status changed 00:14:09
```

```
Spicey#show frame-relay map
Serial0.1 (up): point-to-point dlci, dlci 140(0x8C,0x20C0), broadcast
status defined, active
Priority DLCI Group 1, DLCI 140 (HIGH), DLCI 180 (MEDIUM)
DLCI 190 (NORMAL), DLCI 200 (LOW)
```

```
Spicey#show queueing priority
Current priority queue configuration:
```

```
List Queue Args
1 high protocol ip list 102
1 medium protocol ip tcp port telnet
1 normal protocol ip tcp port ftp
1 low protocol ip
```

To verify the priority queue, use the **debug priority** command.

```
Spicey#debug priority
Priority output queueing debugging is on
```

```
Spicey#ping 123.123.123.1
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 123.123.123.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 44/45/48 ms
Spicey#
*Mar 1 00:32:30.391: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.395: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.399: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:32:30.439: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.443: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.447: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:32:30.487: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.491: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.495: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:32:30.535: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.539: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.543: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:32:30.583: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.587: PQ: Serial0: ip (s=4.0.1.1, d=123.123.123.1) ->high
*Mar 1 00:32:30.587: PQ: Serial0 output (Pk size/Q 104/0)Spicey#
```

```
Spicey#telnet 123.123.123.1
Trying 123.123.123.1 ... Open
```

```
User Access Verification
```

```
Password:
```

```
*Mar 1 00:32:59.447: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.451: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.451: PQ: Serial0 output (Pk size/Q 48/1)
*Mar 1 00:32:59.475: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.479: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.483: PQ: Serial0 output (Pk size/Q 44/1)
*Mar 1 00:32:59.487: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.487: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.491: PQ: Serial0 output (Pk size/Q 53/1)
*Mar 1 00:32:59.495: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.499: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.499: PQ: Serial0 output (Pk size/Q 44/1)
*Mar 1 00:32:59.511: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.511: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.515: PQ: Serial0 output (Pk size/Q 47/1)
```

```

*Mar 1 00:32:59.519: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.519: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.523: PQ: Serial0 output (Pk size/Q 47/1)
*Mar 1 00:32:59.527: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.527: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.531: PQ: Serial0 output (Pk size/Q 53/1)
*Mar 1 00:32:59.539: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.543: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.547: PQ: Serial0 output (Pk size/Q 47/1)
*Mar 1 00:32:59.751: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.755: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:32:59.755: PQ: Serial0 output (Pk size/Q 44/1)
Password:

```

Other IP traffic goes through the low queue.

```

Spicey#
*Mar 1 00:53:57.079: PQ: Serial0 output (Pk size/Q 13/0)
*Mar 1 00:53:58.851: PQ: Serial0: ip -> low
*Mar 1 00:53:58.907: PQ: Serial0: ip -> low
*Mar 1 00:53:58.907: PQ: Serial0 output (Pk size/Q 36/3)
*Mar 1 00:53:59.459: PQ: Serial0: ip -> low
*Mar 1 00:53:59.463: PQ: Serial0: ip -> low
*Mar 1 00:53:59.463: PQ: Serial0 output (Pk size/Q 50/3)
Spicey#

```

Prasit

```
Prasit#show frame-relay pvc
```

```
PVC Statistics for interface Serial11 (Frame Relay DTE)
```

	Active	Inactive	Deleted	Static
Local	1	0	0	0
Switched	0	0	0	0
Unused	0	0	0	0

```
DLCI = 150, DLCI USAGE = LOCAL, PVC STATUS = ACTIVE, INTERFACE = Serial11
```

```

input pkts 134          output pkts 119          in bytes 12029
out bytes 7801          dropped pkts 0           in FECN pkts 0
in BECN pkts 0         out FECN pkts 0         out BECN pkts 0
in DE pkts 0           out DE pkts 0
out bcast pkts 18      out bcast bytes 1260
pvc create time 00:21:15, last time pvc status changed 00:21:15

```

```
Prasit#show frame-relay map
```

```
Serial11 (up): ip 4.0.1.1 dlci 150(0x96,0x2460), dynamic,
               broadcast, status defined, active
```

```
Prasit#ping 124.124.124.1
```

```
Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 124.124.124.1, timeout is 2 seconds:
```

```
!!!!!
```

```
Success rate is 100 percent (5/5), round-trip min/avg/max = 44/45/48
```

```
Here is the debug output shown on Spicey when you use the command above to ping to Spicey :
```

```
Spicey#
```

```

*Mar 1 00:33:26.755: PQ: Serial0 output (Pk size/Q 13/0)
*Mar 1 00:33:28.535: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.539: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.543: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:33:28.583: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high

```

```
*Mar 1 00:33:28.587: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.587: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:33:28.631: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.635: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.635: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:33:28.679: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.683: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.683: PQ: Serial0 output (Pk size/Q 104/0)
*Mar 1 00:33:28.723: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.727: PQ: Serial0: ip (s=124.124.124.1, d=4.0.1.2) ->high
*Mar 1 00:33:28.731: PQ: Serial0 output (Pk size/Q 104/0)
```

```
Prasit#telnet 124.124.124.1
Trying 124.124.124.1 ... Open
```

```
User Access Verification
Password:
Spicey>exit
```

```
[Connection to 124.124.124.1 closed by foreign host]
Prasit#
```

Here is the debug output shown on Spicey when you use the command above to **telnet** to Spicey from Prasit.

```
Spicey#
*Mar 1 00:33:54.499: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.499: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.503: PQ: Serial0 output (Pk size/Q 48/1)
*Mar 1 00:33:54.527: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.531: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.531: PQ: Serial0 output (Pk size/Q 56/1)
*Mar 1 00:33:54.547: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.551: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.555: PQ: Serial0 output (Pk size/Q 86/1)
*Mar 1 00:33:54.559: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.563: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.563: PQ: Serial0 output (Pk size/Q 47/1)
*Mar 1 00:33:54.571: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.575: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.575: PQ: Serial0 output (Pk size/Q 47/1)
*Mar 1 00:33:54.779: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.783: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:54.783: PQ: Serial0 output (Pk size/Q 44/1)
*Mar 1 00:33:56.755: PQ: Serial0 output (Pk size/Q 13/0)
*Mar 1 00:33:57.143: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:57.143: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:57.147: PQ: Serial0 output (Pk size/Q 44/1)
*Mar 1 00:33:57.447: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:57.447: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:57.451: PQ: Serial0 output (Pk size/Q 44/1)
*Mar 1 00:33:57.899: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:57.899: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:57.903: PQ: Serial0 output (Pk size/Q 53/1)
*Mar 1 00:33:59.491: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:59.495: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:59.495: PQ: Serial0 output (Pk size/Q 45/1)
*Mar 1 00:33:59.711: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:59.715: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:59.715: PQ: Serial0 output (Pk size/Q 45/1)
*Mar 1 00:33:59.951: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:59.951: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:33:59.955: PQ: Serial0 output (Pk size/Q 45/1)
*Mar 1 00:34:00.123: PQ: Serial0: ip (tcp 23) -> medium
```

```
*Mar 1 00:34:00.123: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:34:00.127: PQ: Serial0 output (Pk size/Q 45/1)
*Mar 1 00:34:00.327: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:34:00.327: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:34:00.331: PQ: Serial0 output (Pk size/Q 46/1)
*Mar 1 00:34:00.495: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:34:00.499: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:34:00.499: PQ: Serial0 output (Pk size/Q 44/1)
*Mar 1 00:34:00.543: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:34:00.543: PQ: Serial0: ip (tcp 23) -> medium
*Mar 1 00:34:00.547: PQ: Serial0 output (Pk size/Q 44/1)
```

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- [More Information on Frame Relay Commands](#)
 - [More Information on Configuring Frame Relay](#)
 - [Comprehensive Guide to Configuring and Troubleshooting Frame Relay](#)
 - [Frame Relay Technology Support Pages](#)
 - [Technical Support – Cisco Systems](#)
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