

Link Delay Compensation (LDC) NetPerformer[®] System Reference



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Link Delay Compensation (LDC)

This chapter includes the following sections:

- [Link Delay Compensation \(LDC\)](#)
- [LDC Global Parameters.](#)
- [LDC Link Parameters](#)
- [Link Delay Compensation \(LDC\) application example](#)

1.1 Link Delay Compensation (LDC)

With version 10.5.0 R2, NetPerformer compensates for offset delays between satellite and terrestrial links. This feature can be set on PowerCell links and works by adding a compensation delay to terrestrial links, for example when detecting the activation or presence of a satellite link with longer delay in the network. This capability is required, for example, in Air Traffic Control networks where transmission of VHF audio should be synchronized with all locations.

Each unit that needs Link Delay Compensation requires a license, which can be ordered using the following part number: “161-1089-001 - NETPERFORMER LINK DELAY COMPENSATION LICENSE” and set in the unit using the PLS (Product License Status) console command

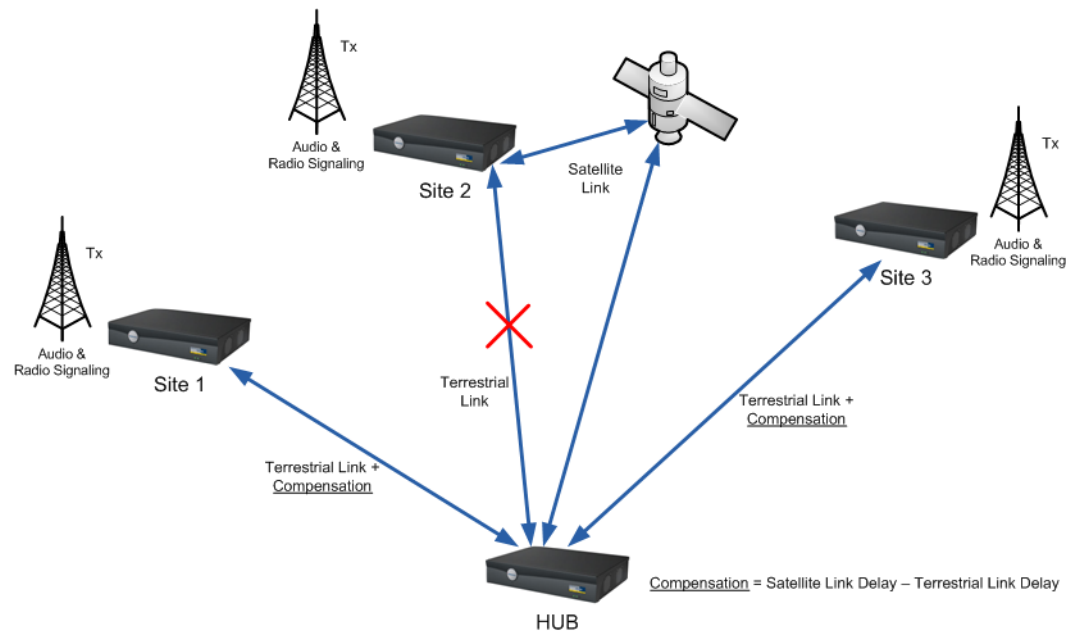


Figure 1-1: Link Delay Compensation with satellite link backup

In Air Traffic Control networks, transmission of audio should be synchronized. For example, in the figure above, NetPerformer with LDC automatically compensates for the largest delay by compensating for the delay introduced by the satellite back up link (site 2) by adding delay on the HUB links going to sites 1 and 3.

NOTE: Link delay variations (wanders) are automatically compensated for by continuous measurement of the link delays in accordance to configurable measurement parameters. For more details see [1.3.1 “Extended Parameters” on page 1-4](#).

1.2 LDC Global Parameters

LDC feature is activated and configured through parameters provided under the LDC profile. This configuration profile as well as any parameters and monitoring functions related to LDC will only appear on the units that have the LDC licenses activated, typically the NetPerformer units located at the central site where link delay compensation is required and applied on the links in both transmission and reception.

Console	SNMP	Text-based Config
LDC / Active	ldcLdcActive	[ldc] LdcActive

Description: Link Delay Compensation activation parameter

Values: NO, YES. Default is NO.

Console	SNMP	Text-based Config
LDC / Maximum delay for compensation (ms)	ldcLdcMaxDelay	[ldc] LdcMaxDelay

Description: Link Delay Compensation maximum delay. This value represents the maximum link delay value above which the NetPerformer will stop adding more delay for compensation.

Values: 10-500. Default is 300.

Console	SNMP	Text-based Config
LDC / Trigger (ms)	ldcLdcTrigger	[ldc] LdcTrigger

Description: Link Delay Compensation trigger. This value represents the offset delay value between the highest link delay and the other link delays above which NetPerformer will start adding compensation delay on the lower delay links.

Values: 5-500. Default is 100.

Console	SNMP	Text-based Config
LDC / Expansion #1 to #10	ldcExpansion01 to 10	[ldc] Expansion01 to 10

Description: Link Delay expansion units (up to 10). Typically, at the HUB, each unit that is part of the LDC group needs to be inter-connected together via PVC/R links and defined in the LDC units expansion parameters. With that information those units will know each other and will be able to exchange their statistics regarding maximum measured link delay, as any high offset delay in that LDC group should trigger link delay compensation mechanism on all the units in that group.

Minimum Length: 0

Maximum Length: 16

Available Characters: A/B/C/D/E/F/G/H/I/J/K/L/M/N/O/P/Q/R/S/T/U/V/W/X/Y/Z/0/1/2/3/4/5/6/7/8/9/./,-/

1.3 LDC Link Parameters

The LDC feature can be activated or de-activated on each PVCR link (Port or PVC) in both transmission and reception. When de-activated, a PVCR link will not provide its measured link delay to the LDC group as well as not apply any delay for compensation on its link.

Console	SNMP	Text-based Config
WAN x / Link delay compensation in transmission	ifwanLdcTx	[ifwan #] LdcTx
PVC x / Link delay compensation in transmission	frpvcLdcTx	[frpvc #] LdcTx

Description: Activate Link delay compensation in transmission

Values: NO, YES. Default is NO.

Console	SNMP	Text-based Config
WAN x / Link delay compensation in reception	ifwanLdcRx	[ifwan #] LdcRx
PVC x / Link delay compensation in receptionf	frpvcLdcRx	[frpvc #] LdcRx

Description: Activate Link delay compensation in reception

Values: NO, YES. Default is NO.

Console	SNMP	Text-based Config
WAN x / Percentage in transmission of the turnaround link delay measurement	ifwanLdcTurnaroundTxRatio	[ifwan #] LdcTurnaroundTxRatio
PVC x / Percentage in transmission of the turnaround link delay measurement	frpvcLdcTurnaroundTxRatio	[frpvc #] LdcTurnaroundTxRatio

Description: This parameter is used to set, in percentage, how much delay comes from the transmitter and how much delay comes from the receptor of the measured link turn around delay. With this approach NetPerformer can manage TX and RX delay compensation separately, which can be symmetric or asymmetric.

Values: 5 to 95; default 50.

Examples:

50 = TX is 50% of the turn-around delay (therefore RX is also 50%)

45 = TX is 45% of the turn-around delay (therefore RX is left with 55%)

70 = TX is 70% of the turn-around delay (therefore RX is left with 30%)

1.3.1 Extended Parameters

With the LDC feature, link delay variations (wanders) are automatically compensated for by continuous measurement of the link delays. This measurement interval is configurable through the following Extended Parameter:


```
CENTRAL-9230>EP GLOBAL PVCRCDELAYINTERVAL  
EXTENDED PARAMETERS  
GLOBAL> (PVCRCDELAYINTERVAL) PVCRC delay interval (0-30,def:30) ? 2 (in  
seconds)
```

For the LDC feature to start compensation as soon as possible on introduction of higher delays on the links in the network, we recommend that you set the PVCRC link delay interval to its minimum value, which is 0. 0. This value represent a delay interval that is calculated from the PVCRC link timeout delay parameter by dividing its value by 4 (def.: $1000\text{ms} / 4 = 250\text{ms}$).

1.4 Link Delay Compensation (LDC) application example

Following is an example of LDC applied on two units at a central location going to three separate remote units with different link delay scenarios. In this example, LDC is set on all three PVCs going to those remote locations.

In this application example, configuration as well as LDC statistic displays are provided based on that network.

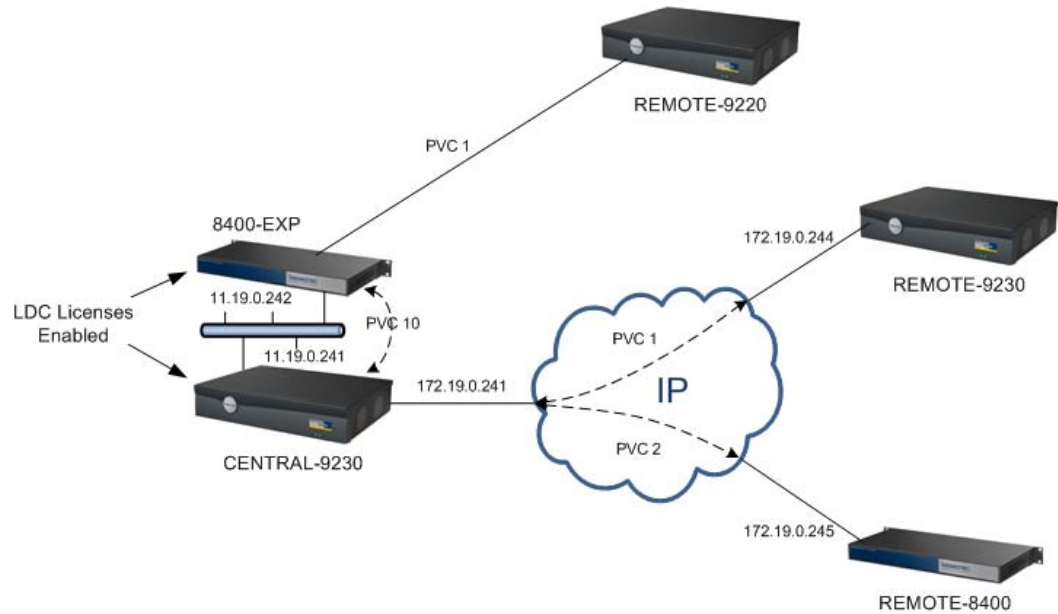


Figure 1-2: Link Delay Compensation network example

HUB Units Configuration

The following provides essential parameter values for configuring NetPerformer units at the Hub site as illustrated in [Figure 1-2](#).

CENTRAL-9230 Global Parameters

```

CENTRAL-9230>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/CUSTOM/ELOG/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/
SLOT/SS7/USER/ALL,def:GLOBAL) ?
GLOBAL> Unit name.....CENTRAL-9230
GLOBAL> PowerCell version.....V1
GLOBAL> Virtual networking over PowerCell.....NO
GLOBAL> Unit routing version.....1
GLOBAL> Unit routing CIR (bps).....64000
GLOBAL> Contact name.....Memotec Inc.
...
GLOBAL> Tone settings.....NORTH AMERICA
GLOBAL> Jitter buffer (ms).....40
GLOBAL> Global CIR for FR over IP.....10000000
GLOBAL> Timer in ms for FR over IP.....50
    
```

CENTRAL-9230 Extended Parameters

```
CENTRAL-9230>EP
EXTENDED PARAMETERS
GLOBAL> (PVCDELAYINTERVAL) PVC delay interval.....2
IP> Multihomed type.....DISABLED
```

CENTRAL-9230 Eth #1 Parameters

```
CENTRAL-9230>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/CUSTOM/ELOG/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/
SLOT/SS7/USER/ALL,def:PORT) ?
Port number (ETH1/ETH2/CSL/1,def:ETH1) ?
PORT ETH 1> Protocol.....ETH AUTO
PORT ETH 1> Link integrity.....YES
PORT ETH 1> LAN speed (mbps).....AUTO
PORT ETH 1> MAC address.....000000000000
PORT ETH 1> Redundancy MAC address active.....NO
PORT ETH 1> DHCP.....DISABLE
PORT ETH 1> IP address 1.....011.019.000.241
PORT ETH 1> Subnet mask 1 (number of bits).....24 {255.255.255.000}
PORT ETH 1> IP address 2.....000.000.000.000
PORT ETH 1> Subnet mask 2 (number of bits).....8 {255.000.000.000}
PORT ETH 1> Redundancy IP address 1.....000.000.000.000
PORT ETH 1> Redundancy subnet mask 1 (number of bits) 8 {255.000.000.000}
PORT ETH 1> Redundancy IP address 2.....000.000.000.000
PORT ETH 1> Redundancy subnet mask 2 (number of bits) 8 {255.000.000.000}
PORT ETH 1> Allow routing between IP networks.....YES
PORT ETH 1> Frame size.....1500
PORT ETH 1> IP RIP.....DISABLE
PORT ETH 1> OSPF.....DISABLE
```

CENTRAL-9230 Eth #2 Parameters

```
CENTRAL-9230>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/CUSTOM/ELOG/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/
SLOT/SS7/USER/ALL,def:PORT) ? PORT
Port number (ETH1/ETH2/CSL/1,def:ETH1) ? ETH2
PORT ETH 2> Protocol.....ETH AUTO
PORT ETH 2> Link integrity.....YES
PORT ETH 2> LAN speed (mbps).....AUTO
PORT ETH 2> MAC address.....000000000000
PORT ETH 2> Redundancy MAC address active.....NO
PORT ETH 2> DHCP.....DISABLE
PORT ETH 2> IP address 1.....172.019.000.241
PORT ETH 2> Subnet mask 1 (number of bits).....24 {255.255.255.000}
PORT ETH 2> IP address 2.....000.000.000.000
PORT ETH 2> Subnet mask 2 (number of bits).....8 {255.000.000.000}
PORT ETH 2> Redundancy IP address 1.....000.000.000.000
PORT ETH 2> Redundancy subnet mask 1 (number of bits) 8 {255.000.000.000}
PORT ETH 2> Redundancy IP address 2.....000.000.000.000
PORT ETH 2> Redundancy subnet mask 2 (number of bits) 8 {255.000.000.000}
PORT ETH 2> Allow routing between IP networks.....YES
PORT ETH 2> Frame size.....1500
PORT ETH 2> IP RIP.....DISABLE
PORT ETH 2> OSPF.....DISABLE
```

CENTRAL-9230 PVC #1 Parameters

```
CENTRAL-9230>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/CUSTOM/ELOG/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/
SLOT/SS7/USER/ALL,def:PORT) ? PVC
PVC number (1-300,def:1) ?
PVC 1> Mode.....PVCR
PVC 1> Port.....0
PVC 1> DLCI address.....101
PVC 1> Committed Information rate.....2048000
PVC 1> Remote unit name.....REMOTE-9230
PVC 1> Link quality active.....NO
PVC 1> Type.....DEDICATED
...
PVC 1> Frame over IP, source.....172.019.000.241
PVC 1> Frame over IP, destination.....172.019.000.244
PVC 1> Frame over IP, port number.....1024
PVC 1> Frame over IP, DSCP.....0
PVC 1> Frame over IP, PVCR legacy format.....DISABLE
PVC 1> Use a forced route.....NO
PVC 1> Use this port as default gateway.....NO
PVC 1> Allow load balancing.....YES
PVC 1> Link delay compensation in transmission.....YES
PVC 1> Link delay compensation in reception.....YES
PVC 1> Percentage in transmission of the turnaround link delay measurement
50
PVC 1> Redundant link.....NO
```

CENTRAL-9230 PVC #2 Parameters

```
CENTRAL-9230>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/CUSTOM/ELOG/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/
SLOT/SS7/USER/ALL,def:PVC) ? PVC
PVC number (1-300,def:1) ? 2
PVC 2> Mode.....PVCR
PVC 2> Port.....0
PVC 2> DLCI address.....102
PVC 2> Committed Information rate.....2048000
PVC 2> Remote unit name.....REMOTE-8400
PVC 2> Link quality active.....NO
PVC 2> Type.....DEDICATED
...
PVC 2> Frame over IP, source.....172.019.000.241
PVC 2> Frame over IP, destination.....172.019.000.245
PVC 2> Frame over IP, port number.....1024
PVC 2> Link delay compensation in transmission.....YES
PVC 2> Link delay compensation in reception.....YES
PVC 2> Percentage in transmission of the turnaround link delay measurement
50
```

CENTRAL-9230 PVC #10 Parameters

```
CENTRAL-9230>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/CUSTOM/ELOG/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/
SLOT/SS7/USER/ALL,def:PVC) ?
PVC number (1-300,def:2) ? 10
```

```
PVC 10> Mode.....PVCR
PVC 10> Port.....0
PVC 10> DLCI address.....900
PVC 10> Committed Information rate.....2048000
PVC 10> Remote unit name.....8400-EXP
PVC 10> Link quality active.....NO
PVC 10> Type.....DEDICATED
...
PVC 10> Frame over IP, source.....11.019.000.241
PVC 10> Frame over IP, destination.....11.019.000.242
PVC 10> Frame over IP, port number.....1024
PVC 10> Allow load balancing.....YES
PVC 10> Link delay compensation in transmission.....NO
PVC 10> Link delay compensation in reception.....NO
PVC 10> Percentage in transmission of the turnaround link delay
measurement 50
PVC 10> Redundant link.....NO
```

CENTRAL-9230 LDC Parameters

```
CENTRAL-9230>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/CUSTOM/ELOG/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/
SLOT/SS7/USER/ALL,def:GLOBAL) ? LDC
LDC> Active.....YES
LDC> Maximum delay for compensation (ms).....300
LDC> Trigger (ms).....30
LDC> Expansion #1.....8400-EXP
...
LDC> Expansion #10.....
```

8400-EXP Global Parameters

```
8400-EXP>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/USER/ALL,
def:LDC) ? GLOBAL
GLOBAL> Unit name.....8400-EXP
GLOBAL> PowerCell version.....V1
GLOBAL> Virtual networking over PowerCell.....NO
GLOBAL> Unit routing version.....1
GLOBAL> Unit routing CIR (bps).....64000
GLOBAL> Contact name.....Memotec Inc.
...
GLOBAL> Global CIR for FR over IP.....10000000
GLOBAL> Timer in ms for FR over IP.....50
```

8400-EXP Extended Parameters

```
8400-EXP>EP
EXTENDED PARAMETERS
GLOBAL> (PVCDELAYINTERVAL) PVC delay interval.....2
IP> Multihomed type.....DISABLED
```

8400-EXP Eth Parameters

```
8400-EXP>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/USER/ALL,
def:GLOBAL) ? PORT
```

```
Port number (ETH/CSL/1/2/3/4,def:ETH) ?
PORT ETH> Protocol.....ETH AUTO
PORT ETH> Link integrity.....YES
PORT ETH> LAN speed (mbps).....AUTO
PORT ETH> MAC address.....000000000000
PORT ETH> Redundancy MAC address active.....NO
PORT ETH> DHCP.....DISABLE
PORT ETH> IP address 1.....11.019.000.242
PORT ETH> Subnet mask 1 (number of bits).....24 {255.255.255.000}
PORT ETH> IP address 2.....000.000.000.000
PORT ETH> Subnet mask 2 (number of bits).....8 {255.000.000.000}
PORT ETH> Redundancy IP address 1.....000.000.000.000
PORT ETH> Redundancy subnet mask 1 (number of bits).8 {255.000.000.000}
PORT ETH> Redundancy IP address 2.....000.000.000.000
PORT ETH> Redundancy subnet mask 2 (number of bits).8 {255.000.000.000}
PORT ETH> Allow routing between IP networks.....YES
PORT ETH> Frame size.....1500
PORT ETH> IP RIP.....DISABLE
PORT ETH> OSPF.....DISABLE
```

8400-EXP Port #1 Parameters

```
8400-EXP>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/USER/ALL,
def:PVC) ? PORT
Port number (ETH/CSL/1/2/3/4,def:ETH) ? 1
PORT 1> Protocol.....FR-USER
PORT 1> Interface.....DTE-RS449
PORT 1> Clocking mode.....EXTERNAL
PORT 1> Binary coding.....NRZ
PORT 1> CRC-0.....NO
PORT 1> Management interface.....LMI
PORT 1> Congestion flow control.....ON
PORT 1> Enquiry timer (s).....2
PORT 1> Report cycle.....2
PORT 1> CLLM function.....OFF
PORT 1> Cell Packetization.....YES
```

8400-EXP PVC #1 Parameters

```
CENTRAL-9230> 8400-EXP>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/USER/ALL,
def:LDC) ? PVC
PVC number (1-300,def:10) ? 1
PVC 1> Mode.....PVCR
PVC 1> Port.....1
PVC 1> DLCI address.....201
PVC 1> Committed Information rate.....1024000
PVC 1> Burst Information rate.....1024000
PVC 1> Remote unit name.....REMOTE-9220
PVC 1> Link quality active.....NO
PVC 1> Type.....DEDICATED
...
PVC 1> IP RIP.....DISABLE
PVC 1> OSPF.....DISABLE
PVC 1> Allow load balancing.....YES
```

```
PVC 1> Link delay compensation in transmission.....YES
PVC 1> Link delay compensation in reception.....YES
PVC 1> Percentage in transmission of the turnaround link delay measurement
50
PVC 1> Redundant link.....NO
```

8400-EXP PVC #10 Parameters

```
8400-EXP>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/USER/ALL,
def:PVC) ?
PVC number (1-300,def:1) ? 10
PVC 10> Mode.....PVCR
PVC 10> Port.....0
PVC 10> DLCI address.....900
PVC 10> Committed Information rate.....2048000
PVC 10> Remote unit name.....CENTRAL-9230
PVC 10> Link quality active.....NO
PVC 10> Type.....DEDICATED
...
PVC 10> Frame over IP, source.....11.019.000.242
PVC 10> Frame over IP, destination.....11.019.000.241
PVC 10> Frame over IP, port number.....1024
PVC 10> Frame over IP, DSCP.....0
PVC 10> Frame over IP, PVCR legacy format.....DISABLE
PVC 10> Use a forced route.....NO
PVC 10> Use this port as default gateway.....NO
PVC 10> Allow load balancing.....YES
PVC 10> Link delay compensation in transmission.....NO
PVC 10> Link delay compensation in reception.....NO
PVC 10> Percentage in transmission of the turnaround link delay
measurement 50
```

8400-EXP LDC Parameters

```
8400-EXP>DP
DISPLAY PARAMETERS
Item (BRIDGE/CLASS/GLOBAL/IP/IPX/LDC/PORT/PVC/REDUNDANCY/USER/ALL,
def:PVC) ? LDC
LDC> Active.....YES
LDC> Maximum delay for compensation (ms).....300
LDC> Trigger (ms).....30
LDC> Expansion #1.....CENTRAL-9230
...
LDC> Expansion #10.....
```




Scenarios

This chapter includes the following:

- [Display Commands for Link Delay Compensation](#)
- [Scenario 1: Main Central Site unit \(CENTRAL-9230\) – Without Added Delay](#)
- [Scenario 1: Expansion Central Site unit \(8400-EXP\) – Without Added Delay](#)
- [Scenario 2: Main Central Site unit \(CENTRAL-9230\) - With 400ms Turnaround Delay Added on EXP-8400's PVC 1](#)
- [Scenario 2: Expansion Central Site unit \(8400-EXP\) - With 400ms Turnaround Delay Added on EXP-8400's PVC 1](#)
- [Scenario 3: Main Central Site unit \(CENTRAL-9230\) - With 400ms Turnaround Delay Added on CENTRAL-9230's PVC 2](#)
- [Scenario 3: Expansion Central Site unit \(8400-EXP\) - With 400ms Turnaround Delay Added on CENTRAL-9230's PVC 2](#)

2.1 Display Commands for Link Delay Compensation

Following are examples of the display states (DS) commands providing information on the LDC activities.

Those display states for LDC are provided for three different scenarios:

1. No added delay on the links (all terrestrials)
2. Delay introduced on PVC 1 between 8400-EXP and REMOTE-9220 using SX-12 link emulating equipment
3. Delay introduced on PVC 2 between CENTRAL-9230 and REMOTE-8400 using the ADDTXDELAY extended parameters

2.1.1 Scenario 1: Main Central Site unit (CENTRAL-9230) – Without Added Delay

Display States - LDC

```
CENTRAL-9230>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY/SLOT,def:PVC) ? LDC
Local> Delay in transmission.....11 ms
Local> Delay in reception.....11 ms

Expansion 1> Name.....8400-EXP
Expansion 1> State.....ACTIVE
Expansion 1> Delay in transmission.....4 ms
Expansion 1> Delay in reception.....4 ms
CENTRAL-9230>
```

Display States - PVCs

```
CENTRAL-9230>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY/SLOT,def:LDC) ? PVC
Global CIR for FR over IP (bps).....10000 k
Sum of all PVC over IP CIR (bps).....6144 k

PVC 1> Mode.....PVCR
PVC 1> Information signals.....USER -A---
PVC 1> Speed used (bps).....2048 k
PVC 1> DLCI.....101
PVC 1> Remote unit name.....REMOTE-9230
PVC 1> State.....DATA
PVC 1> Line delay (turnaround).....16 ms
PVC 1> Delay without LDC in transmission.....8 ms
PVC 1> Delay without LDC in reception.....8 ms
PVC 1> LDC delay in transmission.....0 ms
PVC 1> LDC delay in reception.....0 ms
PVC 2> Mode.....PVCR
PVC 2> Information signals.....USER -A---
PVC 2> Speed used (bps).....2048 k
PVC 2> DLCI.....102
PVC 2> Remote unit name.....REMOTE-8400
PVC 2> State.....DATA
PVC 2> Line delay (turnaround).....22 ms
```

```

PVC 2> Delay without LDC in transmission.....11 ms
PVC 2> Delay without LDC in reception.....11 ms
PVC 2> LDC delay in transmission.....0 ms
PVC 2> LDC delay in reception.....0 ms

PVC 10> Mode.....PVCR
PVC 10> Information signals.....USER -A---
PVC 10> Speed used (bps).....2048 k
PVC 10> DLCI.....900
PVC 10> Remote unit name.....8400-EXP
PVC 10> State.....DATA
PVC 10> Line delay.....11 ms

Info signals: NETwork/USER (N)ew (A)ctive (C)ir (F)ecn (B)ecn (-)off
CENTRAL-9230>

```

2.1.2 Scenario 1: Expansion Central Site unit (8400-EXP) – Without Added Delay

Display States - LDC

```

8400-EXP>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY,def:DHCPSRV) ? LDC

Local> Delay in transmission.....10 ms
Local> Delay in reception.....10 ms

Expansion 1> Name.....CENTRAL-9230
Expansion 1> State.....ACTIVE
Expansion 1> Delay in transmission.....9 ms
Expansion 1> Delay in reception.....9 ms
8400-EXP>

```

Display States - PVCs

```

8400-EXP>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY,def:LDC) ? PVC
Global CIR for FR over IP (bps).....10000 k
Sum of all PVC over IP CIR (bps).....2048 k

PVC 1> Mode.....PVCR
PVC 1> Information signals.....USER -A---
PVC 1> Speed used (bps).....1024 k
PVC 1> DLCI.....201
PVC 1> Remote unit name.....REMOTE-9220
PVC 1> State.....DATA
PVC 1> Line delay (turnaround).....20 ms
PVC 1> Delay without LDC in transmission.....10 ms
PVC 1> Delay without LDC in reception.....10 ms
PVC 1> LDC delay in transmission.....0 ms
PVC 1> LDC delay in reception.....0 ms
□
PVC 10> Mode.....PVCR
PVC 10> Information signals.....USER -A---
PVC 10> Speed used (bps).....2048 k
PVC 10> DLCI.....900

```

```
PVC 10> Remote unit name.....CENTRAL-9230
PVC 10> State.....DATA
PVC 10> Line delay.....11 ms
```

2.1.3 Scenario 2: Main Central Site unit (CENTRAL-9230) - With 400ms Turnaround Delay Added on EXP-8400's PVC 1

Display States - LDC

```
CENTRAL-9230>DS
DISPLAY STATES
Item (DHCP SRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY/SLOT,def:PVC) ? LDC
Local> Delay in transmission.....14 ms
Local> Delay in reception.....14 ms

Expansion 1> Name.....8400-EXP
Expansion 1> State.....ACTIVE
Expansion 1> Delay in transmission.....215 ms
Expansion 1> Delay in reception.....215 ms
```

CENTRAL-9230>

Display States - PVCs

```
CENTRAL-9230>DS
DISPLAY STATES
Item (DHCP SRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY/SLOT,def:LDC) ? PVC
Global CIR for FR over IP (bps).....10000 k
Sum of all PVC over IP CIR (bps).....6144 k

PVC 1> Mode.....PVCR
PVC 1> Information signals.....USER -A---
PVC 1> Speed used (bps).....2048 k
PVC 1> DLCI.....101
PVC 1> Remote unit name.....REMOTE-9230
PVC 1> State.....DATA
PVC 1> Line delay (turnaround).....440 ms
PVC 1> Delay without LDC in transmission.....13 ms
PVC 1> Delay without LDC in reception.....13 ms
PVC 1> LDC delay in transmission.....201 ms
PVC 1> LDC delay in reception.....201 ms
PVC 2> Mode.....PVCR
PVC 2> Information signals.....USER -A---
PVC 2> Speed used (bps).....2048 k
PVC 2> DLCI.....102
PVC 2> Remote unit name.....REMOTE-8400
PVC 2> State.....DATA
PVC 2> Line delay (turnaround).....424 ms
PVC 2> Delay without LDC in transmission.....9 ms
PVC 2> Delay without LDC in reception.....9 ms
PVC 2> LDC delay in transmission.....205 ms
PVC 2> LDC delay in reception.....205 ms

PVC 10> Mode.....PVCR
PVC 10> Information signals.....USER -A---
PVC 10> Speed used (bps).....2048 k
PVC 10> DLCI.....900
```

```

PVC 10> Remote unit name.....8400-EXP
PVC 10> State.....DATA
PVC 10> Line delay.....13 ms

Info signals: NETwork/USER (N)ew (A)ctive (C)ir (F)ecn (B)ecn (-)off
CENTRAL-9230>

```

2.1.4 Scenario 2: Expansion Central Site unit (8400-EXP) - With 400ms Turnaround Delay Added on EXP-8400's PVC 1

Display States - LDC

```

8400-EXP>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY,def:PVC) ? LDC
Local> Delay in transmission.....211 ms
Local> Delay in reception.....211 ms

Expansion 1> Name.....CENTRAL-9230
Expansion 1> State.....ACTIVE
Expansion 1> Delay in transmission.....14 ms
Expansion 1> Delay in reception.....14 ms

```

Display States - PVCs

```

8400-EXP>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY,def:LDC) ? PVC
Global CIR for FR over IP (bps).....10000 k
Sum of all PVC over IP CIR (bps).....2048 k

PVC 1> Mode.....PVCR
PVC 1> Information signals.....USER -A---
PVC 1> Speed used (bps).....1024 k
PVC 1> DLCI.....201
PVC 1> Remote unit name.....REMOTE-9220
PVC 1> State.....DATA
PVC 1> Line delay (turnaround).....428 ms
PVC 1> Delay without LDC in transmission.....214 ms
PVC 1> Delay without LDC in reception.....214 ms
PVC 1> LDC delay in transmission.....0 ms
PVC 1> LDC delay in reception.....0 ms

PVC 10> Mode.....PVCR
PVC 10> Information signals.....USER -A---
PVC 10> Speed used (bps).....2048 k
PVC 10> DLCI.....900
PVC 10> Remote unit name.....CENTRAL-9230
PVC 10> State.....DATA
PVC 10> Line delay.....9 ms

Info signals: NETwork/USER (N)ew (A)ctive (C)ir (F)ecn (B)ecn (-)off
8400-EXP>

```

2.1.5 Scenario 3: Main Central Site unit (CENTRAL-9230) - With 400ms Turnaround Delay Added on CENTRAL-9230's PVC 2

Display States - LDC

```
CENTRAL-9230>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY/SLOT,def:PVC) ? LDC

Local> Delay in transmission.....210 ms
Local> Delay in reception.....210 ms

Expansion 1> Name.....8400-EXP
Expansion 1> State.....ACTIVE
Expansion 1> Delay in transmission.....12 ms
Expansion 1> Delay in reception.....12 ms
```

Display States - PVCs

```
CENTRAL-9230>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY/SLOT,def:LDC) ? PVC
Global CIR for FR over IP (bps).....10000 k
Sum of all PVC over IP CIR (bps).....6144 k

PVC 1> Mode.....PVCR
PVC 1> Information signals.....USER -A---
PVC 1> Speed used (bps).....2048 k
PVC 1> DLCI.....101
PVC 1> Remote unit name.....REMOTE-9230
PVC 1> State.....DATA
PVC 1> Line delay (turnaround).....408 ms
PVC 1> Delay without LDC in transmission.....7 ms
PVC 1> Delay without LDC in reception.....7 ms
PVC 1> LDC delay in transmission.....207 ms
PVC 1> LDC delay in reception.....207 ms
PVC 2> Mode.....PVCR
PVC 2> Information signals.....USER -A---
PVC 2> Speed used (bps).....2048 k
PVC 2> DLCI.....102
PVC 2> Remote unit name.....REMOTE-8400
PVC 2> State.....DATA
PVC 2> Line delay (turnaround).....414 ms
PVC 2> Delay without LDC in transmission.....207 ms
PVC 2> Delay without LDC in reception.....207 ms
PVC 2> LDC delay in transmission.....0 ms
PVC 2> LDC delay in reception.....0 ms

PVC 10> Mode.....PVCR
PVC 10> Information signals.....USER -A---
PVC 10> Speed used (bps).....2048 k
PVC 10> DLCI.....900
PVC 10> Remote unit name.....8400-EXP
PVC 10> State.....DATA
PVC 10> Line delay.....13 ms

Info signals: NETwork/USER (N)ew (A)ctive (C)ir (F)ecn (B)ecn (-)off
```

CENTRAL-9230>

2.1.6 Scenario 3: Expansion Central Site unit (8400-EXP) - With 400ms Turnaround Delay Added on CENTRAL-9230's PVC 2

Display States - LDC

```
8400-EXP>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY,def:PVC) ? LDC
Local> Delay in transmission.....13 ms
Local> Delay in reception.....13 ms

Expansion 1> Name.....CENTRAL-9230
Expansion 1> State.....ACTIVE
Expansion 1> Delay in transmission.....212 ms
Expansion 1> Delay in reception.....212 ms
8400-EXP>
```

Display States - PVCs

```
8400-EXP>DS
DISPLAY STATES
Item (DHCPSRV/GLOBAL/LDC/PORT/PVC/REDUNDANCY,def:LDC) ? PVC
Global CIR for FR over IP (bps).....10000 k
Sum of all PVC over IP CIR (bps).....2048 k

PVC 1> Mode.....PVCR
PVC 1> Information signals.....USER -A---
PVC 1> Speed used (bps).....1024 k
PVC 1> DLCI.....201
PVC 1> Remote unit name.....REMOTE-9220
PVC 1> State.....DATA
PVC 1> Line delay (turnaround).....430 ms
PVC 1> Delay without LDC in transmission.....7 ms
PVC 1> Delay without LDC in reception.....7 ms
PVC 1> LDC delay in transmission.....203 ms
PVC 1> LDC delay in reception.....203 ms

PVC 10> Mode.....PVCR
PVC 10> Information signals.....USER -A---
PVC 10> Speed used (bps).....2048 k
PVC 10> DLCI.....900
PVC 10> Remote unit name.....CENTRAL-9230
PVC 10> State.....DATA
PVC 10> Line delay.....11 ms
Info signals: NETwork/USER (N)ew (A)ctive (C)ir (F)ecn (B)ecn (-)off
8400-EXP>
```

Enter the required Login / Password and click on Sign In. By default the NetPerformer Login and Password are as follows:

- Login: admin
- Password: setup

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