



WAN/Point-to-Point Protocol (PPP) NetPerformer[®] System Reference

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NetPerformer PPP Support

1.1 About Point-to-Point Protocol

The Point-to-Point Protocol (PPP) transports multi-protocol packets over a simple point-to-point connection, using:

- PPP encapsulation: to carry different network protocols together over the same link
- Link Control Protocol (LCP): to establish and terminate the data-link connection
- Network Control Protocol (NCP): to configure the network-layer protocols, including IP.

NetPerformer support of PPP follows the concepts developed in RFC-1661, *The Point-to-Point Protocol (PPP)*, July, 1994.

When configuring a PPP port or channel, the standard defaults will handle most applications. Changes are automatically communicated to the peer device, as each end of the link describes its capabilities and requirements to the other through a negotiation process.

1.2 LCP Configuration Options

LCP is a negotiation mechanism that is used for:

- Negotiation of encapsulation format options
- Authentication of peer identity
- Detection of errors in the configuration
- Detection of loopback
- Link monitoring functions
- Termination of the connection.

LCP configuration options are negotiated between the two peers of a connection. They apply in one direction only, usually in the receive direction of the link from the point of view of the Configure-Request sender.

Note: LCP and NCP parameters are configured separately on the NetPerformer. LCP parameters are discussed in this document. NCP parameters pertain to IP support. Refer to the *LAN Connection and IP Networks* module of this document series.

1.2.1 Maximum Receive Unit (MRU)

- Can be sent to inform the peer that the port can receive larger packets, or to request that the peer send smaller packets.
- Default is set at 1500 bytes. If its value is smaller than this, the port must still be able to receive the default number, in case link synchronization is lost.

- Specifies the maximum number of bytes in the Information and Padding fields. This does not include the bits or bytes for framing, the Protocol field, FCS or transparency.

1.2.2 Magic Number

- This option is used to detect loopback links and other data link layer anomalies.
- It triggers a comparison of two numbers. If the numbers are the same this means an echo has occurred, and loopback is likely.
- By default the Magic Number is not negotiated. Zero is inserted instead.

1.2.3 Asynchronous Control Character Map (ACCM)

- This option is used to agree with the peer as to which characters should be protected for transparency.
- By default, all 32 characters from ASCII 0 to 31 are protected, as well as the Control Escape character (ASCII 125) and the Flag character (ASCII 126).

1.3 PPP Link Operation

For each PPP session, the NetPerformer sends:

1. LCP packets to configure and test the link
2. NCP packets to choose and configure the network-layer protocol(s)
3. Datagrams that contain the PPP-encapsulated traffic, once the connection is established
4. LCP or NCP packets to explicitly close down the link.

NOTE: Alternatively, the session may be closed through an inactivity timeout, or manual intervention from the network administrator.

1.3.1 Connection Phases and State Transitions

The following states or phases typically occur during a PPP session:

- **Link Dead:** The physical layer is not ready. This moves to an LCP **UP** state (or event).
- **Link Establishment:** Exchange of Configure packets for connection negotiation. The next state is an LCP **OPENED** state.
- **Network Layer Protocol:** Each protocol is configured separately by NCP. Once this phase is opened, the NetPerformer sends the network-layer protocol packets (NCP packets).
- **Link Termination:** This phase occurs when there is a loss of carrier, authentication failure, link quality failure, inactivity timeout or manual closure by the network administrator.
 - An exchange of Terminate packets takes place, which signals the physical layer to disconnect.
 - The peer that sends the Terminate-Request disconnects after receiving a Terminate-Ack or after the Restart counter expires.
 - The peer that receives the Terminate-Request waits for the other end to disconnect first, and does not disconnect until at least one Restart time (period) has expired after sending its Terminate-Ack.
 - The start or restart of the Restart timer occurs only with the Send-Configure-Request, Send-Terminate-Request and Zero-Restart-Count actions.

Note: On the NetPerformer, this timer is set using the *LCP timeout (seconds)* parameter.

1.4 PAP/CHAP Authentication

The NetPerformer can authenticate PPP connections to protect them from unauthorized use. Two authentication protocols are supported:

- **Password Authentication Protocol (PAP):** Provides password protection only once during the PPP session. The NetPerformer respects RFC-1334 for PAP operation.
- **Challenge Handshake Authentication Protocol (CHAP):** Requests authentication from the remote site at random intervals during the PPP session, which is particularly useful for long-term connections. The NetPerformer respects RFC-1994 for CHAP operation.

On the NetPerformer, PPP authentication criteria are defined for each user who may require a PPP session. The PPP User Profile maintains authentication information for up to 32 individual users. For the configuration procedure, turn to [“Configuring PAP/CHAP Authentication” on page 2-11](#).

Note: Authentication parameters (**PPPUSER**) have been separated from standard PPP parameters in NetPerformer V10.2.1, to allow multiple users to be authenticated for one PPPoE connection when server mode is supported. Refer to [“PPP over Ethernet \(PPPoE\)” on page 4-1](#).

1.5 Counters and Timers

1.5.1 Restart Timer

The restart timer times the transmission period for Configure-Request and Terminate-Request packets. If the timer expires a timeout event occurs, followed by retransmission of the packet.

This timer is configurable, with a standard default of 3 seconds. It should be configured based on the speed of the link. The default is designed for low-speed lines (2400 to 9600 bps) and links with a high switching latency (such as telephone lines).

If you have higher speed links or links with low switching latency the retransmission time is reduced. For example, round trip times for modems at 14,400 bps are in the range of 160 to 600 milliseconds. The restart timer can be reduced in this case.

Note: On the NetPerformer, the restart timer is configured using the *LCP timeout (seconds)* parameter, which serves for both the LCP and NCP protocols.

1.5.2 Max-Terminate

Max-Terminate is a restart counter for Terminate-Requests. It indicates how many Terminate-Request packets have been sent without receiving a Terminate-Ack, before assuming that the peer is unable to respond.

Note: On the NetPerformer, this parameter is not configurable, and is set at **2** transmissions.

1.5.3 Max-Configure

Max-Configure is a restart counter for Configure-Requests. It indicates how many Configure-Requests have been sent without receiving a Configure-Ack, Configure-Nak or Configure-Reject, before assuming that the peer is unable to respond.

Note: On the NetPerformer, this restart counter is governed by the *LCP retries* parameter.

1.5.4 Max-Failure

Max-Failure is a restart counter for Configure-Nak. It indicates the number of Configure-Nak packets that have been sent without sending a Configure-Ack, before assuming that the configuration is not converging (successful negotiation).

Note: On the NetPerformer this parameter is not configurable, and is set at **5** transmissions.

1.6 Asynchronous PPP Flag Sharing

The flag sharing feature of asynchronous PPP is fully supported on reception only. Flag sharing allows for single flags between frames, for example:

```
<7e>frame_1<7e>frame_2<7e>
```

instead of:

```
<7e>frame_1<7e><7e>frame_2<7e>
```

Flag sharing is permitted even when several seconds may elapse between frames. However, it is implemented on reception only. That is, the NetPerformer will accept a reduced number of flags between frames, but will continue to send fully flagged frames.



PPP Configuration

2.1 PPP Port/Channel Configuration Parameters

To verify the configuration or monitor the status of a PPP connection, refer to the chapter *Checking WAN Link Status* in the *WAN/Leased Lines* module of this document series. Special displays for PPP over Ethernet are described in the section “[Monitoring Functions for PPPoE](#)” on page 4-10.

Caution: When a PPP port parameter is changed, a PPP negotiation procedure is immediately carried out. This causes a link down condition, during which time the link restarts with the new value of the parameter. Do not make PPP configuration changes during an active session.

The **PORT** or **SLOT** submenu of the **SETUP** console command includes all parameters required to configure a WAN connection, including a PPP connection. If you are using SNMP, all WAN configuration variables are grouped under the *ifwan* category. For text-based configuration the *[ifwan#]* heading is used, where # represents the number of the port or channel.

Console	SNMP	Text-based Config
SE/PORT (serial port) SE/SLOT (digital channel or dual serial port)	<i>ifwan</i> (category)	<i>[ifwan#]</i> (heading)

A PPP connection can be configured on a serial port (including ports built into the base unit, ports on the Dual Serial Port interface card and the console port) or a channel on a digital interface card (see “[Configuring Synchronous PPP on a Digital Channel](#)” on page 2-6).

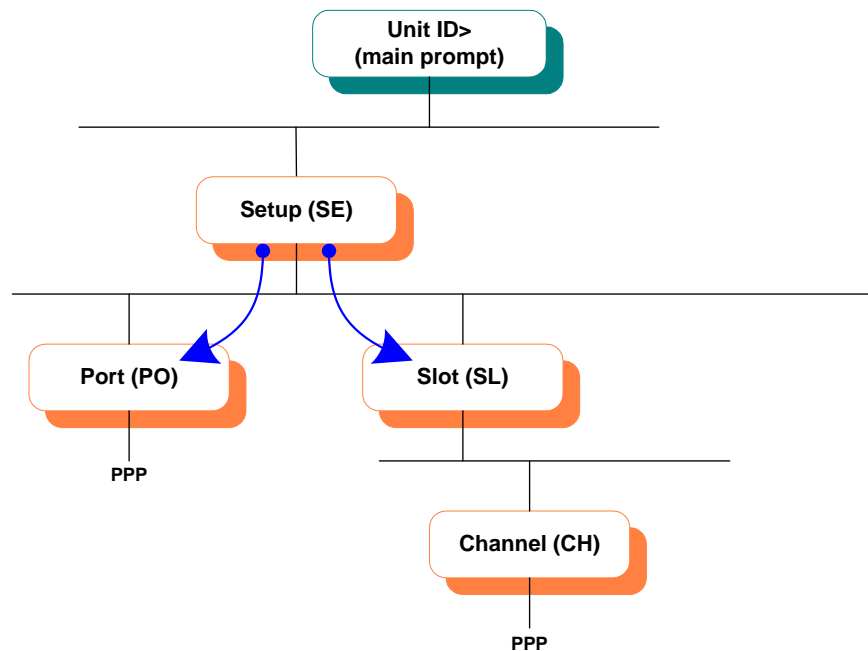


Figure 2-1: SETUP/PORT and SETUP/SLOT/CHANNEL Paths on the CLI Tree for PPP Protocol

To set a built-in serial port on the base unit to PPP:

1. Enter the menu sequence: **SE** ↵ **PORT**
2. Select the *Port number*
3. Set the *Protocol* to **PPP**
4. Set the *Port Clocking* to **SYNC** (see “[Configuring Synchronous PPP on a Serial Port](#)” on page 2-5) or **ASYNC** (see “[Configuring Asynchronous PPP](#)” on page 2-7)
5. Change the other port parameters from their default values, if desired.

To set a digital channel or a serial port on the Dual Serial interface card to PPP:

1. Enter the menu sequence: **SE** ↵ **SLOT**
2. Select the *Slot number*
3. Enter **CHANNEL** (for a digital channel only)
4. Select the *Channel number*, e.g. **102**, where the first digit indicates the slot and the last two digits indicate the channel
5. Set the *Protocol* to **PPP**
6. Set the *Port Clocking* to **SYNC** (see “[Configuring Synchronous PPP on a Serial Port](#)” on page 2-5) or **ASYNC** (see “[Configuring Asynchronous PPP](#)” on page 2-7)

Note: Asynchronous PPP is available on a port of the Dual Serial interface card, but *not* on a digital channel.

7. Change the other channel parameters from their default values, if desired.
 - Serial port configuration is described in “[Configuring Synchronous PPP on a Serial Port](#)” on page 2-5 and “[Configuring Asynchronous PPP](#)” on page 2-7
 - For digital channel configuration, refer to “[Configuring Synchronous PPP on a Digital Channel](#)” on page 2-6
 - For console port configuration refer to “[Configuring Asynchronous PPP on the Console Port](#)” on page 2-9.

Note: A PPPoE application is configured using a different submenu of the **SETUP** command. Refer to the chapter “[PPP over Ethernet \(PPPoE\)](#)” on page 4-1.

2.1.1 Limitations on Legacy Dual Serial Interface Card



Caution: The following limitations apply when the PPP protocol is configured on a Dual Serial interface card on the SDM-9360, SDM-9380 or SDM-9585:

- *Frame delay* is not supported
- *CRC encoding* is fixed at **NRZ**.

2.1.2 Setting the Protocol and Port Clocking

```
SE/PORT/#/
PPP example:
setting the
Protocol and
Port Clocking

SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH1/ETH2/CSL/1,def:1) ?
PORT 1> Protocol (def:FR-USER) ? PPP
PORT 1> Port Clocking (def:ASYNC) ?
...
```

2.1.3 Protocol

Console	SNMP	Text-based Config
Protocol	ifwanProtocol	[ifwan#] Protocol

This parameter defines the operating protocol for the port or channel. Use the value **PPP** to configure the port for the Point-to-Point Protocol.

Note: The other values of this parameter are explained in the appendix *SE/PORT/#/PVCR* in the *WAN/Leased Lines* module of this document series.

2.1.4 Port Clocking

Console	SNMP	Text-based Config
Port Clocking	ifwanFormat	[ifwan#] Format

This parameter defines the type of clocking to be used on the PPP port:

SYNC: For synchronous PPP. Many of the synchronous PPP characteristics are identical to those of an HDLC port.

ASYNC: For asynchronous PPP port. This is the default selection, as shown in the example above. Many of the asynchronous PPP characteristics are identical to those of a reliable asynchronous (**R-ASYNC**) port.

Note: The console port (**CSL**) supports asynchronous PPP only. A digital channel supports synchronous PPP only. A serial port (either built-in or on the Dual Serial interface card) supports both synchronous and asynchronous PPP.

The *Port Clocking* parameter determines whether asynchronous or synchronous PPP parameters will be listed at the console for further configuration of the port or channel.

- Synchronous PPP is addressed in the next section
- For asynchronous PPP, turn to [“Configuring Asynchronous PPP” on page 2-7](#).

Values: SYNC, ASYNC

Default: ASYNC

2.1.5 Configuring Synchronous PPP on a Serial Port

Note: Synchronous PPP is not available on the console port (**CSL**).

When you define a PPP port with synchronous port clocking (using the *Port Clocking* parameter set to **SYNC**), the following port parameters are listed on the console:

**SE/PORT/#/
PPP example:
with SYNC
Port Clocking**

```
SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH1/ETH2/CSL/1,def:ETH1) ? 1
PORT 1> Protocol (def:FR-USER) ? PPP
PORT 1> Port Clocking (def:ASYN) ? SYNC
PORT 1> Interface.....DCE-RS449
PORT 1> Clocking mode (def:INTERNAL) ?
PORT 1> Port speed (bps) (1200-6144000,def:56000) ?
PORT 1> CRC encoding (def:NRZ) ?
PORT 1> Idle (def:FLAG) ?
PORT 1> Frame delay (msec) (def:0.0) ?
PORT 1> PPP User (def:NONE) ?
PORT 1> Silent (def:SEND REQUEST) ?
PORT 1> LCP timeout (seconds) (1-255,def:3) ?
PORT 1> LCP retries, 255 = forever (0-255,def:255) ?
PORT 1> Negotiate MRU (def:NO) ? YES
PORT 1> Proposed MRU (0-3000,def:1500) ?
PORT 1> Use MRU proposed by peer (def:NO) ? YES
PORT 1> Maximum accepted MRU from peer (0-3000,def:1500) ?
PORT 1> Request Magic Number (def:YES) ?
PORT 1> Accept Magic Number Request (def:YES) ?
PORT 1> Keepalive (def:DISABLE) ?
PORT 1> Accept Addresses Old Negotiation (def:NO) ?
PORT 1> Request IP-Address (def:NO) ?
PORT 1> Accept IP-Address Request (def:NO) ?
PORT 1> Request DNS-Address (def:NO) ?
PORT 1> Accept DNS-Address Request (def:NO) ?
PORT 1> IP address (def:000.000.000.000) ?
PORT 1> Subnet mask (number of bits) (0-32,def:8) ?
{255.000.000.000}
PORT 1> IP RIP (def:V1) ?
PORT 1> IP RIP TX/RX (def:DUPLEX) ?
PORT 1> OSPF (def:DISABLE) ?
PORT 1> IP multicast active (def:NO) ?
PORT 1> NAT enable (def:NO) ?
PORT 1> Filter (def:ALL) ?
PORT 1> Mode (def:DEDICATED) ?
```

- The *Protocol* and *Port Clocking* parameters are described on [“Protocol” on page 2-4](#).
- *Interface*, *Clocking mode*, *Port Speed (bps)*, *IP address*, *Subnet mask (number of bits)*, *IP RIP*, *IP RIP TX/RX*, *OSPF*, *IP multicast active*, *NAT enable* and *Filter* are common to other WAN/user ports, and are described in the appendix *SE/*

PORT/#/PVCR Configuration Parameters in the *WAN/Leased Lines* module of this document series.

- The other parameters set specific PPP characteristics, and are detailed in the appendix “[SE/PORT/#/PPP Configuration Parameters](#)” on page 5-1.
- Also refer to the chapter “[PPP Backup Methods](#)” on page 3-1 for details on the *Mode* parameter, which determines the type of port/PVC backup that the PPP port will perform.

2.1.6 Configuring Synchronous PPP on a Digital Channel

Note: Synchronous PPP is supported on both a digital channel or a port on the Dual Serial interface card. Asynchronous PPP is not supported on a digital channel. The NetPerformer unit must be installed with a Dual Serial interface card to support asynchronous PPP on an interface card.

To set a digital channel or a serial port on the Dual Serial interface card to synchronous PPP:

- Enter the menu sequence: **SE ↵ SLOT**
- Select the *Slot number*
- Enter **CHANNEL** at the *Item* prompt
- Select the *Channel number*, e.g. **102**, where the first digit indicates the slot and the last two digits indicate the channel
- Set the *Protocol* to **PPP**
- Change the other channel parameters from their default values, if desired.

When you set a digital channel or Dual Serial port to PPP, the following parameters are listed on the console:

SE/SLOT/#/ CHANNEL/PPP example

```
SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? SLOT
SLOT> Slot number (1/2,def:1) ? 2
Item (LINK/CHANNEL,def:LINK) ? CHANNEL
SLOT> Channel Number (201-224/ALL,def:201) ?
PORT 201> Protocol (def:OFF) ? PPP
PORT 201> Timeslot (def:1) ?
PORT 201> Number of consecutive timeslots (1-24,def:1) ?
PORT 201> DS0 speed (bps) (def:64000) ?
PORT 201> PPP User (def:NONE) ?
PORT 201> Silent (def:SEND REQUEST) ?
PORT 201> LCP timeout (seconds) (1-255,def:3) ?
PORT 201> LCP retries, 255 = forever (0-255,def:255) ?
PORT 201> Negotiate MRU (def:NO) ?
PORT 201> Use MRU proposed by peer (def:NO) ?
```

```

PORT 201> Request Magic Number (def:YES) ?
PORT 201> Accept Magic Number Request (def:YES) ?
PORT 201> Keepalive (def:DISABLE) ?
PORT 201> Accept Addresses Old Negotiation (def:NO) ?
PORT 201> Request IP-Address (def:NO) ?
PORT 201> Accept IP-Address Request (def:NO) ?
PORT 201> Request DNS-Address (def:NO) ?
PORT 201> Accept DNS-Address Request (def:NO) ?
PORT 201> IP address (def:000.000.000.000) ?
PORT 201> Subnet mask (number of bits) (0-32,def:8) ?
{255.000.000.000}
PORT 201> IP RIP (def:V1) ?
PORT 201> IP RIP TX/RX (def:DUPLEX) ?
PORT 201> OSPF (def:DISABLE) ?
PORT 201> IP multicast active (def:NO) ?
PORT 201> NAT enable (def:NO) ?
PORT 201> Filter (def:ALL) ?
PORT 201> Mode (def:DEDICATED) ?

```

- The *Protocol* parameter is described on [“Protocol” on page 2-4](#).
- For details concerning the *Timeslot*, *Number of consecutive timeslots* and *DS0 speed (bps)* parameters, refer to the appendix *SE/SLOT/#/CHANNEL Configuration Parameters* in the *Digital Data* module of this document series.
- *IP address*, *Subnet mask*, *IP RIP*, *IP RIP TX/RX*, *OSPF*, *IP multicast active*, *NAT enable* and *Filter* are common to other WAN digital channels, and are described in the appendix *SE/PORT/#/PVCR Configuration Parameters* in the *WAN/Leased Lines* module of this document series.
- All other parameters in this example are the same as for synchronous PPP on a serial port, and are described in the appendix [“SE/PORT/#/PPP Configuration Parameters” on page 5-1](#).

2.1.7 Configuring Asynchronous PPP

Asynchronous PPP can be configured on a built-in serial port or a port on the Dual Serial interface card. It cannot be configured on a digital channel. To select asynchronous PPP during the port configuration:

- Set the *Port Clocking* parameter to **ASYNC**.

When you define a PPP port with asynchronous port clocking the following parameters are listed on the console:

SE/PORT/#/ PPP example: with ASYNC Port Clocking

```

SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH1/ETH2/CSL/1,def:1) ?
PORT 1> Protocol (def:PVCR) ? PPP
PORT 1> Port Clocking (def:ASYNC) ?

```

```

PORT 1> Interface.....DCE-V35
PORT 1> Clocking mode (def:ASYNC) ?
PORT 1> Port speed (bps) (300-115200,def:56000) ?
PORT 1> Reception flow control (def:NONE) ?
PORT 1> Transmission flow control (def:NONE) ?
PORT 1> Transmit holding time (sec) (0-2000,def:0) ?
PORT 1> PPP User (def:NONE) ?
PORT 1> Silent (def:SEND REQUEST) ?
PORT 1> LCP timeout (seconds) (1-255,def:3) ?
PORT 1> LCP retries, 255 = forever (0-255,def:255) ?
PORT 1> Negotiate MRU (def:NO) ?
PORT 1> Use MRU proposed by peer (def:NO) ?
PORT 1> Negotiate ACCM with peer (rcv) (def:YES) ?
PORT 1> Requested ACCM characters (def:000A0000) ?
PORT 1> Accept ACCM negotiation from peer (xmt) (def:YES) ?
PORT 1> Acceptable ACCM characters (def:000A0000) ?
PORT 1> Request Magic Number (def:YES) ?
PORT 1> Accept Magic Number Request (def:YES) ?
PORT 1> Accept Addresses Old Negotiation (def:NO) ?
PORT 1> Request IP-Address (def:NO) ?
PORT 1> Accept IP-Address Request (def:NO) ?
PORT 1> Request DNS-Address (def:NO) ?
PORT 1> Accept DNS-Address Request (def:NO) ?
PORT 1> IP address (def:000.000.000.000) ?
PORT 1> Subnet mask (number of bits) (0-32,def:8) ?
{255.000.000.000}
PORT 1> IP RIP (def:V1) ?
PORT 1> IP RIP TX/RX (def:DUPLEX) ?
PORT 1> OSPF (def:DISABLE) ?
PORT 1> IP multicast active (def:NO) ?
PORT 1> NAT enable (def:NO) ?
PORT 1> Filter (def:ALL) ?
PORT 1> Mode (def:DEDICATED) ? CALL-BKUP LINK
PORT 1> Delay before call activation (sec) (1-1000,def:10) ?
PORT 1> Delay before call deactivation (sec) (1-1000,def:120) ?
PORT 1> Call activation timer (sec) (30-1000,def:30) ?
PORT 1> Dialer (def:DTR) ? AT-115200
PORT 1> PPP dial index (def:NONE) ? 1,4-7
...

```

- The *Protocol* and *Port Clocking* parameters are described on [“Protocol” on page 2-4](#).
- *Interface*, *Clocking mode*, *Port Speed (bps)*, *IP address*, *Subnet mask*, *IP RIP*, *IP RIP TX/RX*, *OSPF*, *IP multicast active*, *NAT enable* and *Filter* are common to other WAN/user ports, and are described in the appendix *SE/PORT/#/PVCR Configuration Parameters* in the *WAN/Leased Lines* module of this document series.
- *PPP User*, *Silent*, *LCP timeout (seconds)*, *LCP retries*, *Negotiate MRU*, *Use MRU proposed by peer*, *Request Magic Number*, *Accept Magic Number*, *Accept Addresses Old Negotiation*, *Request IP-Address*, *Accept IP-Address*, *Request DNS-Address* and *Accept DNS-Address Request* are common to synchronous PPP ports, and are described in the section [SYNC Port Clocking](#) in the appendix [“SE/PORT/#/PPP Configuration Parameters”](#) on page 5-1.

- *Delay before call activation, Delay before call deactivation (sec), Call activation timer (sec) and Dialer* appear when the *Mode* parameter is set to **CALL-BKUP LINK** (see “[PPP Link Backup](#)” on page 3-5). These parameters are detailed in the *CALL-BKUP Mode* section of the appendix *SE/PORT/#/PVCR Configuration Parameters* in the *WAN/Leased Lines* module of this document series.
- The other parameters set characteristics specific to asynchronous PPP, and are detailed in “[ASYNC Port Clocking](#)” on page 5-12.

Note: The example above shows the *PPP dial index* parameter set to a numeric range of values. The parameters governing the **BACKUP CRITERIA** characteristics are displayed on the console after this parameter. Refer to “[PPP Backup Methods](#)” on page 3-1 for further information.

2.1.8 Configuring Asynchronous PPP on the Console Port

The console port can be configured to support a PPP session using asynchronous PPP. This configuration can be carried out using the console command line interface only.

Note: Only asynchronous port clocking is available for PPP on the console port. The *Port Clocking* parameter is a read-only parameter that displays the value **ASYNC**.

When the console port is set to **PPP** you can access a NetPerformer unit via the Internet, and carry out console configuration and management functions without requiring a circuit-switched telephone connection.

SE/PORT/CSL/ PPP example

```
SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH1/ETH2/CSL/1,def:ETH1) ? CSL
PORT CSL> Protocol (def:CONSOLE) ? PPP
PORT CSL> Port Clocking.....ASYNC
PORT CSL> Reception flow control (def:NONE) ?
PORT CSL> Transmission flow control (def:NONE) ?
PORT CSL> Transmit holding time (sec) (0-2000,def:2000) ?
PORT CSL> PPP User (def:NONE) ?
PORT CSL> Silent (def:SEND REQUEST) ?
PORT CSL> LCP timeout (seconds) (1-255,def:3) ?
PORT CSL> LCP retries, 255 = forever (0-255,def:255) ?
PORT CSL> Negotiate MRU (def:NO) ?
PORT CSL> Use MRU proposed by peer (def:NO) ?
PORT CSL> Negotiate ACCM with peer (rcv) (def:YES) ?
PORT CSL> Requested ACCM characters (def:000A0000) ?
PORT CSL> Accept ACCM negotiation from peer (xmt) (def:YES) ?
PORT CSL> Acceptable ACCM characters (def:000A0000) ?
PORT CSL> Request Magic Number (def:YES) ?
PORT CSL> Accept Magic Number Request (def:YES) ?
PORT CSL> Keepalive (def:DISABLE) ?
PORT CSL> Accept Addresses Old Negotiation (def:NO) ?
PORT CSL> Request IP-Address (def:NO) ?
```

```
PORT CSL> Accept IP-Address Request (def:NO) ?
PORT CSL> Request DNS-Address (def:NO) ?
PORT CSL> Accept DNS-Address Request (def:NO) ?
PORT CSL> IP address (def:000.000.000.000) ?
PORT CSL> Subnet mask (number of bits) (0-32,def:8) ?
{255.000.000.000}
PORT CSL> IP RIP (def:V1) ?
PORT CSL> IP RIP TX/RX (def:DUPLEX) ?
PORT CSL> OSPF (def:DISABLE) ?
PORT CSL> IP multicast active (def:NO) ?
PORT CSL> NAT enable (def:NO) ?
PORT CSL> Filter (def:ALL) ?
PORT CSL> About to switch console to PPP mode (def:BACK TO CONSOLE
) ?
```

- The *Protocol* parameter is described on [“Protocol” on page 2-4](#).
- *Reception flow control, Transmission flow control, Transmit holding time (sec), Negotiate ACCM with peer (rcv), Requested ACCM characters, Accept ACCM negotiation from peer (xmt) and Acceptable ACCM characters* are described in [“ASYNCR Port Clocking” on page 5-12](#).
- *IP address, Subnet mask, IP RIP, IP RIP TX/RX, OSPF, IP multicast active, NAT enable* and *Filter* are common to other WAN/user ports, and are described in the appendix *SE/PORT/#/PVCR Configuration Parameters* in the *WAN/Leased Lines* module of this document series.
- The other parameters are common to asynchronous PPP ports, and are described in the appendix [“SE/PORT/#/PPP Configuration Parameters” on page 5-1](#).
- After the *Filter* parameter, the prompt **About to switch console to PPP mode** appears.
 - To confirm that you want the console port to operate with the PPP protocol, enter **GO PPP**.
 - To cancel PPP operation on the console port, enter **BACK TO CONSOLE**. This is the default setting.

2.2 Configuring PAP/CHAP Authentication

The NetPerformer can authenticate PPP connections using Password Authentication Protocol (PAP) or Challenge Handshake Authentication Protocol (CHAP) in 32 individual PPPUSER Profile entries. See “[PAP/CHAP Authentication](#)” on page 1-5.

To update the PPP User Profile, use the **PPPUSER** submenu of the **SETUP** command. If you are using SNMP, all variables governing authentication criteria are grouped under the *pppuser* category. For text-based configuration the *[pppuser#]* heading is used, where # represents the number of the PPP User Profile entry.

Console	SNMP	Text-based Config
SE/PPPUSER	<i>pppuser</i> (category)	<i>[pppuser#]</i> (heading)

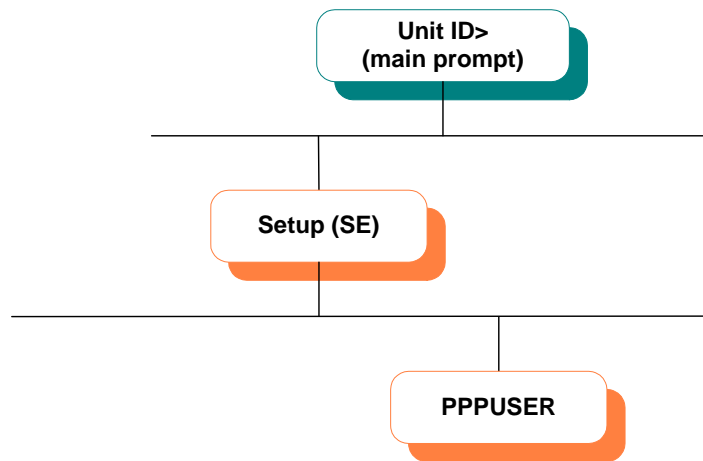


Figure 2-2: SE/PPPUSER Path in the CLI Tree

To configure the PAP/CHAP authentication criteria for a PPP User:

1. At the NetPerformer command line prompt, enter the menu sequence: **SE ↵**
PPPUSER
2. Select the *PPPUSER* number
3. Enter **YES** to activate this entry
4. Specify the *Incoming Authentication type*
5. Specify the *Outgoing Authentication type*
6. Change the other **PPPUSER** parameters from their default values, if desired.

SE/PPPUSER example

```

9380.1>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PPPUSER
  
```

```
PPPUSER number (1-32,def:1) ? 1
PPPUSER 1> PPPUSER active (def:NO) ? YES
PPPUSER 1> Incoming Authentication type (def:NONE) ? PAP
PPPUSER 1> Incoming user name (def:) ? beleimoloko.ca
PPPUSER 1> Incoming password (def:) ? lege4u2
PPPUSER 1> Outgoing Authentication type (def:NONE) ? PAP
PPPUSER 1> Outgoing user name (def:) ? chorneynoch.ca
PPPUSER 1> Outgoing password (def:) ? h03znbg5
PPPUSER 1> Authentication retries, 255 = forever (0-255,def:3) ?
PPPUSER 1> Fail delay (minutes) (0-255,def:0) ?
PPPUSER 1> Maximum challenge interval (minutes) (1-255,def:60) ?
PPPUSER 1> Authentication timeout (seconds) (1-255,def:10) ?
```

For detailed information on these parameters, consult the appendix [“SE/PPPUSER Configuration Parameters”](#) on page 6-1.



PPP Backup Methods

3.1 About the Backup Methods

The NetPerformer supports three PPP backup methods in case the primary path fails:

- **PVCR link backup:** Provides an alternative path for PPP traffic transported using PowerCell. This method relies on the status of a **specific destination** as the backup trigger. If that destination is down, the backup PVCR port takes over. For details, refer to the [WAN/Leased Lines](#) module of this document series.
- **IP-triggered PPP backup:** Provides an alternative path for the IP traffic in case the usual path fails. This method relies on the status of a **specific IP address**. If that address is unreachable, a backup PPP port takes over. For details, refer to the next section.
- **PPP link backup:** Introduced in NetPerformer V10.2.1, this backup method triggers activation of a PPP port when a **specific link** fails. If that link is down, a backup PPP port takes over. For details, refer to [“PPP Link Backup” on page 3-5](#).

Both **IP-triggered PPP backup** and **PPP link backup** are defined using the same configuration parameters. Refer to [“Configuring the PPP Backup Characteristics” on page 3-10](#).

3.2 IP-triggered PPP Backup

The NetPerformer *IP-triggered PPP Backup* function provides network dependability and redundancy in case of an **IP routing failure**. When IP-triggered PPP backup is configured between two NetPerformers, a backup PPP link is automatically activated **if the specified IP address is unreachable**. This feature provides an alternative path for IP data in case the usual path fails.

In a typical application, a PPP port uses a dialup modem to back up the IP connection through the WAN. In the example in [Figure 3-1](#), IP traffic normally goes through the Frame Relay cloud via a PVC/PVC. If the terminal cannot reach Server 1 (no response from the IP address of Server 1), the terminal will use the IP address of Server 2. This activates a backup PPP connection over a dialup phone line.

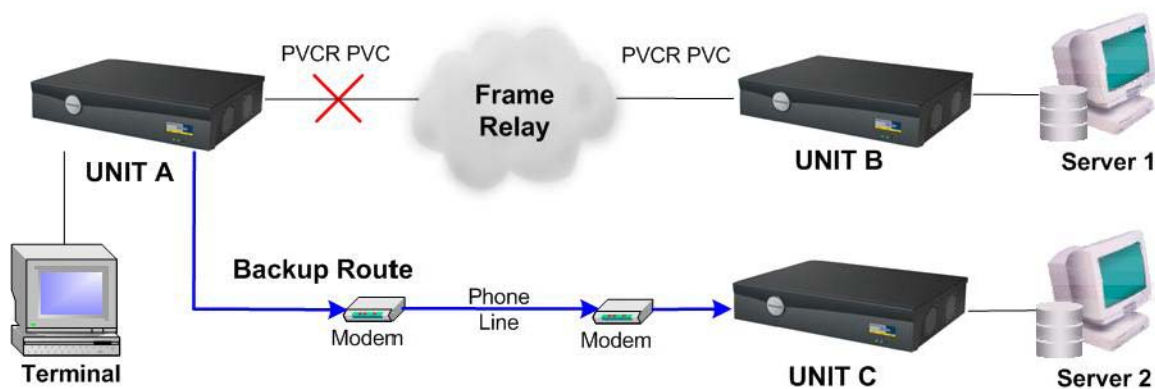


Figure 3-1: Typical Scenario for IP-triggered PPP Backup

Configuration of IP-triggered PPP backup on a PPP port is similar to that of link backup on a PVC/PVC port:

- One side is configured to activate a call when the link goes down (**CALL-BKUP IP** mode). In the example shown in [Figure 3-1](#), the **CALL-BKUP IP** link is a PPP port on Unit A.
- The other side is configured to answer the call (**ANSWER** mode). In the example above, the **ANSWER** port is configured on Unit C.

NOTE: A **CALL-BKUP IP** link can also be used for answering a call.

3.2.1 Operation

Under normal circumstances a terminal with a given IP address will use its usual IP path. If the terminal does not receive a response over this path, it can use a backup address, defined with the *Backup IP address* parameter. When the NetPerformer detects this address, it sets up a backup PPP link to allow IP traffic to reach its destination.

- The phone number for the backup PPP link is specified with the *Phone number* parameter defined in the selected PPP Dial Index profile (1-16). Define the dialing type with the *Dialer* parameter.
- If the backup link does not come up immediately, the *Call activation timer (sec)* parameter controls when the NetPerformer will redial.
- Once the main IP link has been restored, the backup PPP link drops after a certain length of time. This delay is configured with the *Delay before call deactivation (sec)* parameter.
- Up to 16 different backup IP addresses can be configured, using a different *PPP dial index* number for each backup address. However, the number of IP addresses should be kept to a minimum to avoid degrading overall system performance.

3.3 PPP Link Backup

The NetPerformer *PPP Link Backup* function provides network dependability and redundancy in case of a **port or PVC link failure**. When PPP link backup is configured between two NetPerformers, a backup PPP link is automatically activated **if the specified port or PVC fails**.

NOTE: More than one port or PVC can be backed up on the same PPP link if a dialup line is used. The types of ports and PVCs that can be backed up are listed on “[Link to Back](#)” on page 3-8.

The backup link uses an alternate route between the two NetPerformer units. Both ends of this alternate route must be defined on the appropriate unit:

- One side is configured to activate a call when the link goes down (**CALL-BKUP LINK** mode). In the example shown in [Figure 3-2](#), the **CALL-BKUP LINK** is a PPP port on Unit A.
- The other side is configured to answer the call (**ANSWER** mode). In the example below, the **ANSWER** port is configured on Unit C.

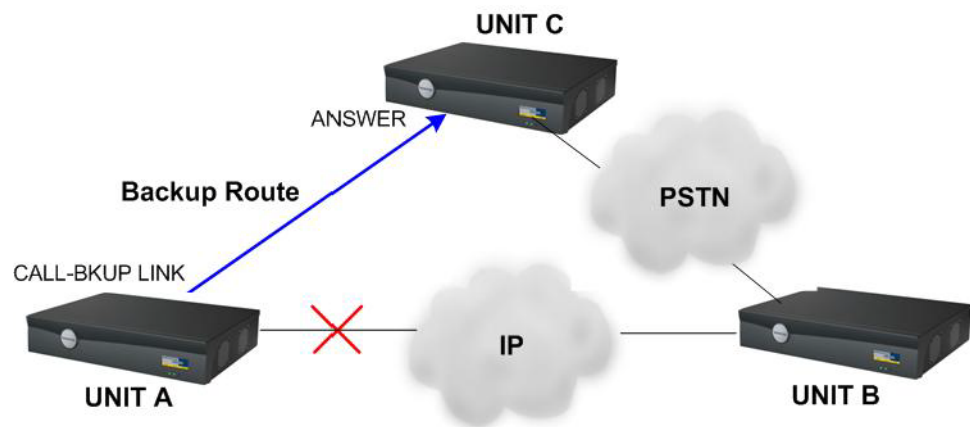


Figure 3-2: PPP Link Backup Scenario

3.3.1 Operation

In case of a failure on the specified port or PVC, the NetPerformer unit controlling the backup mechanism (Unit A) can activate a PPP backup link to take over transmissions to the destination (Unit B).

- Unit A tries to establish the PPP backup link when it discovers that it has lost contact with the specified port or PVC on Unit B.
- Unit A activates the PPP backup link according to its dialing mode setting, for example, by raising the **DTR** or **X.21 COMMAND** signal. Several dialing modes are supported (see “[Dialer Type](#)” on page 3-7), and are configured with the *Dialer* parameter on the PPP port.
- When the failed port or PVC comes back up, Unit A detects that the lost destination is now back.

For a PVCR PVC running FRoIP, the unit requires a special PING from the returned destination before it can drop the PPP backup link (see “[Backing up an FRoIP PVC Connection](#)” on page 3-9).

- If the newly returned link does not fail again during a brief testing period, Unit A deactivates the PPP backup link according to its dialing mode setting, for example, by lowering the **DTR** or **X.21 COMMAND** signal.

You can also terminate the backup manually using the **HANG** command. For further information, refer to the chapter [Manual Link Activation and Deactivation](#) in the *WAN/Leased Lines* module of this document series.

3.4 Requirements

3.4.1 Backup Link

The backup link must be a serial port or digital channel configured with the PPP protocol.

3.4.2 Port Clocking

Either **SYNC** or **ASYNC** *Port clocking* can be used. **ASYNC** is available on serial ports only (either built-in or on the Dual Serial interface card). Refer to “[Setting the Protocol and Port Clocking](#)” on page 2-4.

3.4.3 Dialer Type

For a dialup connection on a serial port, you must specify the *Dialer* type. Consult [Table 1](#) on “[Dialer Types for PPP Backup Link](#)” on page 3-7. If you choose a *Dialer* type that requires a dial phone number, you must specify this number using the **SETUP/PHONE** menu. For parameter details, consult the appendix [SE/PHONE Configuration Parameters](#) in the *WAN/Leased Lines* module of this document series.

ISDN mode is used for a PPP link configured on a digital channel. This mode does not require dialing information. All ISDN properties are configured on the digital link, using the **SLOT/LINK** submenu of the **SETUP** command. For further information, go to the [Digital Data](#) module of this document series.

Dialer Type	NetPerformer Action	Conditions
DTR	Raises the DTR signal (RS-232 or V.35)	Choose this setting when the PPP port uses a dedicated line or a modem that activates as soon as the DTR signal is raised
X21-L1	Raises the X.21 COMMAND signal (X.21 level 1)	Choose this setting when the PPP port uses a dedicated line or a modem that activates as soon as the COMMAND signal is raised
V25-H	Sends the V25bis dial command with a dial phone number to the modem, using the HDLC protocol	For HDLC applications. Requires configuration of a dial phone number. The PPP port can be configured to back up more than one link, with a different destination for each.

Table 1 *Dialer Types for PPP Backup Link*

Dialer Type	NetPerformer Action	Conditions
V25-B	Sends the V25bis dial command with a dial phone number to the modem, using the IBM BSC protocol	For BSC applications. Requires configuration of a dial phone number. The PPP port can be configured to back up more than one link, with a different destination for each.
AT-9600, AT-19200, AT-28800, AT-38400, AT-57600, AT-115200	Sends the ATE0V1 command to the modem in asynchronous mode at the specified speed, followed by the ATD command with the dial phone number	Requires configuration of a dial phone number. The PPP port can be configured to back up more than one link, with a different destination for each.

Table 1 Dialer Types for PPP Backup Link



Caution: All *Dialer* modes need a constant CTS (Clear To Send) signal from the modem to be able to establish communication. Ensure that the modem is set to always provide the CTS signal.

3.4.4 Link to Back

The following types of links can be backed up using PPP Link Backup:

- **Serial Ports:**
 - PPP protocol with SYNC *Port clocking*
 - PPP protocol with ASYNC *Port clocking*
- **Digital Channels:**
 - PPP protocol with SYNC *Port clocking*
- **PVCs:**
 - PowerCell: PVCR mode
 - Frame Relay (FR): RFC1490 mode or PVCR mode running Frame Relay over IP (FRoIP)
 - ATM: ATMPPP, ATMPVCR or RFC1483 mode.

3.5 Backing up an FRoIP PVC Connection

An FRoIP PVC connection requires special treatment for successful PPP link backup termination. Unlike other PVC types, the PPP backup link cannot be stopped when the original link is restored. This is because FRoIP transmissions resume immediately when an alternate IP route becomes available via the PPP backup link.

To drop the backup link, the *original IP route* must be restored. When the response to a PING along this route is good, the NetPerformer unit drops the PPP backup link and the FRoIP PVC returns to its original IP route.

The original IP route is defined using three parameters which automatically appear in the **SETUP/PORT** parameter listing when the PPP backup link is configured to back up an FRoIP connection:

- **FRoIP link type:** Defines the type of link interface that the FRoIP connection uses, which can be:
 - **PORT:** For serial (PVCR) or LAN (ETH) ports
 - **FR PVC:** For Frame Relay PVCs and PVCR PVCs running FRoIP
 - **ATM PVC:** For ATM PVCs (available on an ATM-ready unit only).
- **FRoIP IP link:** The original IP port interface through which the special PING will be requested
- **FRoIP next hop:** The IP address of the next hop that must be used to reach the destination. The PING reply will be routed back through the same path.

For details on these parameters, refer to [“BACKUP CRITERIA Parameters”](#) on page 5-15.

3.6 Configuring the PPP Backup Characteristics

PPP backup methods are configured with parameters that are listed at the end of the port or channel configuration (see “[PPP Port/Channel Configuration Parameters](#)” on page 2-2).

- The value of the *Mode* parameter determines which backup method is used:

CALL-BKUP IP: for IP-triggered PPP backup

CALL-BKUP LINK: for PPP link backup.

NOTE: If the *Mode* is set to **DEDICATED**, the only backup function available is PVC/R link backup. For details, refer to the [WAN/Leased Lines](#) module of this document series.

- The value of the *PPP backup criteria* parameter determines whether the PPP backup characteristics (**BACKUP CRITERIA**) will be defined. If set to **NONE**, no other parameters are listed at the console.
- If the **BACKUP CRITERIA** characteristics for a PPP backup link require dialing with a phone number, you must set up a **PHONE** Profile entry with the dialing information. The **SETUP/PHONE** parameters are detailed in the appendix [SE/PHONE Configuration Parameters](#) in the [WAN/Leased Lines](#) module of this document series.
- If the **BACKUP CRITERIA** characteristics require authentication, you must set up a **PPPUSER** profile with the authentication information. Refer to “[SE/PPPUSER Configuration Parameters](#)” on page 6-1.

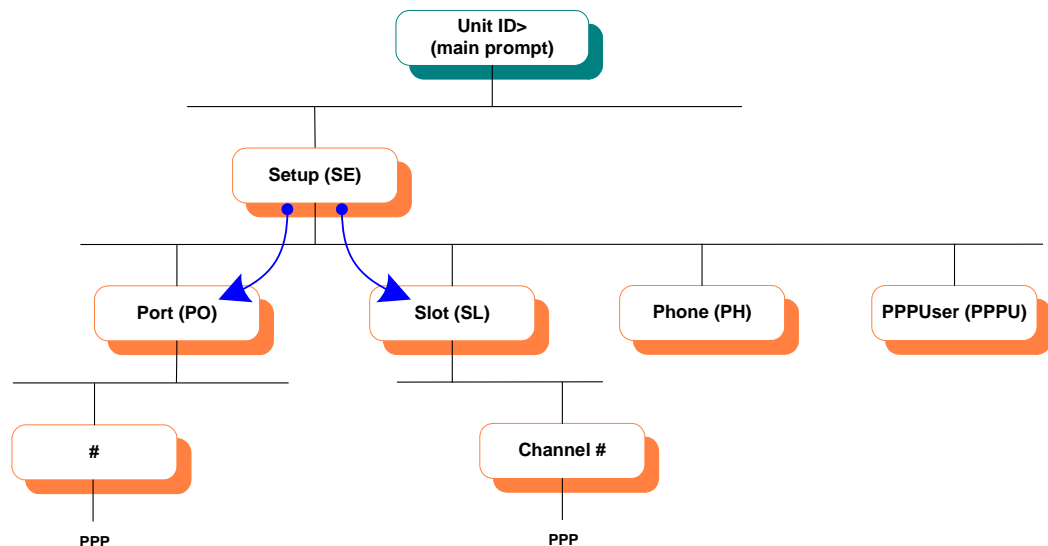


Figure 3-3: *SETUP* Commands in the CLI Tree for PPP Backup Methods

3.6.1 Configuring the NetPerformer for IP-triggered PPP Backup

To set up IP-triggered PPP backup you need to configure:

- A PPP port on the calling side in **CALL-BKUP IP** mode (see next section)
- A PPP port on the answering side in **ANSWER** mode (see “[Answering Side](#)” on [page 3-16](#))

NOTE: You can also use a PPP port in **CALL-BKUP IP** mode for answering a call.

3.6.2 Calling Side

To configure the calling side of an IP-triggered PPP backup connection:

1. At the NetPerformer command line prompt, enter the menu sequence:
 - **SE** ↵ **PORT** for a built-in serial port
 - **SE** ↵ **SLOT**, then the *Slot number* for a serial port on the Dual Serial interface card
 - **SE** ↵ **SLOT**, then the *Slot number* and **CHANNEL** for a channel on a digital interface card
2. Select the *Port number* or *Channel number*
3. Set the *Protocol* to **PPP**
4. Set the *Port Clocking* to **SYNC** or **ASYNC**

NOTE: **ASYNC** is available on serial ports only (either built-in or on the Dual Serial interface card)

5. Set the *Mode* to **CALL-BKUP IP**
6. Change the other port parameters from their default values, if desired. Important parameters include:
 - *Delay before call deactivation (sec)*
 - *Call activation timer (sec)*
 - *Dialer*
 - *PPP dial index*
7. If you set the *PPP dial index* to a numeric value you must define:
 - *Backup IP address*
 - *Phone number*

- If the connection requires authentication, the *PPP User* parameter. Configure the PPP User Profile entry as described in [“Configuring PAP/CHAP Authentication”](#) on page 2-11.

NOTE: When IP-triggered PPP backup is activated, the PPP User Profile entry that will be used for authentication purposes is the one referenced in the **BACKUP CRITERIA** parameters. If no *PPP user* is referenced in the **BACKUP CRITERIA** parameters, the NetPerformer will use the PPP User Profile entry that is referenced in the **PORT** configuration.

8. Change the other port parameters from their default values, if desired. Refer to [“PPP Port/Channel Configuration Parameters”](#) on page 2-2.

**SE/PORT/#/
PPP example:
CALL-BKUP IP
mode**

```
SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH/CSL/1/2/3,def:1) ?
PORT 1> Protocol (def:PPP) ?
PORT 1> Format (def:ASYNC) ?
PORT 1> Interface.....DCE-V35
PORT 1> Clocking mode (def:SYNC) ?
PORT 1> Port speed (bps) (300-115200,def:56000) ?
...
PORT 1> Filter (def:ALL) ?
PORT 1> Mode (def:DEDICATED) ? CALL-BKUP IP
PORT 1> Delay before call deactivation (sec) (1-1000,def:120) ?
PORT 1> Call activation timer (sec) (30-1000,def:30) ?
PORT 1> Dialer (def:DTR) ? AT-9600
PORT 1> PPP backup criteria (def:1) ? 2
BACKUP CRITERIA 2> Backup IP address (def:000.000.000.000) ?
5.0.1.12
BACKUP CRITERIA 2> Phone number (def:) ? 5551234
BACKUP CRITERIA 2> PPP User (def:NONE) ? 1
```

- For details on the *Mode* parameter, turn to [“Mode”](#) on page 5-9.
- *Delay before call deactivation (sec)*, *Call activation timer (sec)* and *Dialer* are the same parameters that are used to configure link backup on a PVC/R port. Refer to the [CALL-BKUP Mode](#) section of the appendix [SE/PORT/#/PVCR Configuration Parameters](#) in the [WAN/Leased Lines](#) module of this document series.
- For details on the *PPP backup criteria* parameter, turn to [“PPP backup criteria”](#) on page 5-10. The **BACKUP CRITERIA** parameters are detailed in the section [“BACKUP CRITERIA Parameters”](#) on page 5-15.

3.6.3 Answering Side

To configure the answering side of an IP-triggered PPP backup connection:

1. At the NetPerformer command line prompt, enter the menu sequence:
 - **SE** ↵ **PORT** for a built-in serial port
 - **SE** ↵ **SLOT**, then the *Slot number* for a serial port on the Dual Serial interface card
 - **SE** ↵ **SLOT**, then the *Slot number* and **CHANNEL** for a channel on a digital interface card
2. Select the *Port number* or *Channel number*
3. Set the *Protocol* to **PPP**
4. Set the *Port clocking* to **SYNC** or **ASYNC**
ASYNC is available on serial ports only (either built-in or on the Dual Serial interface card)
5. Set the *Mode* to **ANSWER**
6. Set the *Dialer* to the same value that is configured on the **CALL-BKUP IP** port at the other end of the connection (see previous section)
7. Leave the *PPP dial index* at its default value, **NONE**
8. Change the other port parameters from their default values, if desired. Refer to [“PPP Port/Channel Configuration Parameters” on page 2-2](#).

**SE/PORT/#/
PPP example:
ANSWER
Mode**

```
SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH/CSL/1/2/3,def:1) ?
PORT 1> Protocol (def:PPP) ?
PORT 1> Format (def:ASYNC) ?
PORT 1> Interface.....DCE-V35
PORT 1> Clocking mode (def:SYNC) ?
PORT 1> Port speed (bps) (300-115200,def:56000) ?
...
PORT 1> Filter (def:1-5) ?
PORT 1> Mode (def:CALL-BKUP LINK) ? ANSWER
PORT 1> Dialer (def:AT-115200) ?
PORT 1> PPP dial index (def:NONE) ?
```

- For details on the *Mode* parameter, turn to [“Mode” on page 5-9](#).
- The *Dialer* parameter is used to configure link backup on a PVC port. Refer to the [CALL-BKUP Mode](#) section of the appendix [SE/PORT/#/PVCR Configuration Parameters](#) in the [WAN/Leased Lines](#) module of this document series.
- For details on the *PPP dial index* parameter, turn to [“PPP backup criteria” on page 5-10](#).

3.7 Configuring the NetPerformer for PPP Link Backup

To set up a PPP backup link you need to configure:

- A PPP port on the calling side of the backup link in **CALL-BKUP LINK** mode (see next section)
- A PPP port on the answering side of the backup link in **ANSWER** mode), as described on [“Answering Side” on page 3-16](#)

NOTE: You can also use a PPP port in **CALL-BKUP LINK** mode for answering a call.

3.7.1 Calling Side

To configure the calling side of a PPP backup link:

1. At the NetPerformer command line prompt, enter the menu sequence:
 - **SE** ↵ **PORT** for a built-in serial port
 - **SE** ↵ **SLOT**, then the *Slot number* for a serial port on the Dual Serial interface card
 - **SE** ↵ **SLOT**, then the *Slot number* and **CHANNEL** for a channel on a digital interface card
2. Select the *Port number* or *Channel number*
3. Set the *Protocol* to **PPP**
4. Set the *Port Clocking* to **SYNC** or **ASYNC**
ASYNC is available on serial ports only (either built-in or on the Dual Serial interface card)
5. Set the *Mode* to **CALL-BKUP LINK**
6. Change the other port parameters from their default values, if desired. Important parameters include:
 - *Delay before call activation (sec)*
 - *Delay before call deactivation (sec)*
 - *Call activation timer (sec)*
 - *Dialer*
 - *PPP dial index*
7. If you set the *PPP dial index* to a numeric value or range of values, change the following parameters from their default values for each PPP dial index you defined:
 - *Backup link type*
 - *Link to back*

- *Phone entry index*. Also configure the PHONE Profile entries using the **SETUP/PHONE** command. For details, refer to the appendix [SE/PHONE Configuration Parameters](#) in the [WAN/Leased Lines](#) module of this document series.

For a PPP backup link, only the *Dialer type* parameter (**MODEM** or **ISDN**) and related parameters are required. The *Remote unit*, *Next hop* and *Cost* parameters are used for PVC/R link backup, and are not required for a PPP link.

- If the connection requires authentication, the *PPP User* parameter. Configure the PPP User Profile entry as described in “[Configuring PAP/CHAP Authentication](#)” on page 2-11.

When a PPP backup link is activated, the PPP User Profile entry that will be used for authentication purposes is the one referenced in the **BACKUP CRITERIA** parameters. If no *PPP user* is referenced in the **BACKUP CRITERIA** parameters, the NetPerformer will use the PPP User Profile entry that is referenced in the **PORT** configuration.

- For an FRoIP connection only:

FRoIP IP link type

FRoIP IP link

FRoIP next hop

8. Change the other port parameters from their default values, if desired. Refer to “[PPP Port/Channel Configuration Parameters](#)” on page 2-2.

**SE/PORT/#/
PPP example:
CALL-BKUP
LINK mode**

```
SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH/CSL/1/2/3,def:1) ?
PORT 1> Protocol (def:PPP) ?
PORT 1> Format (def:ASYNC) ?
PORT 1> Interface.....DCE-V35
PORT 1> Clocking mode (def:SYNC) ?
PORT 1> Port speed (bps) (300-115200,def:56000) ?
...
PORT 1> Filter (def:ALL) ?
PORT 1> Mode (def:DEDICATED) ? CALL-BKUP LINK
PORT 1> Delay before call activation (sec) (1-1000,def:10) ?
PORT 1> Delay before call deactivation (sec) (1-1000,def:120) ?
PORT 1> Call activation timer (sec) (30-1000,def:30) ?
PORT 1> Dialer (def:DTR) ? AT-115200
PORT 1> PPP backup criteria (def:NONE) ? 1,4-7
BACKUP CRITERIA 1> Backup link type (def:PORT) ?
BACKUP CRITERIA 1> Link to back (def:NONE) ? 2
BACKUP CRITERIA 1> Phone entry index (1-64,def:1) ?
BACKUP CRITERIA 1> PPP User (def:NONE) ? 1
BACKUP CRITERIA 4> Backup link type (def:PORT) ?
BACKUP CRITERIA 4> Link to back (def:NONE) ?
BACKUP CRITERIA 4> Phone entry index (1-64,def:1) ?
```

```
BACKUP CRITERIA 4> PPP User (def:NONE) ?
BACKUP CRITERIA 5> Backup link type (def:PORT) ?
BACKUP CRITERIA 5> Link to back (def:NONE) ?
BACKUP CRITERIA 5> Phone entry index (1-64,def:1) ?
BACKUP CRITERIA 5> PPP User (def:NONE) ?
BACKUP CRITERIA 6> Backup link type (def:PORT) ?
BACKUP CRITERIA 6> Link to back (def:NONE) ?
BACKUP CRITERIA 6> Phone entry index (1-64,def:1) ?
BACKUP CRITERIA 6> PPP User (def:NONE) ?
BACKUP CRITERIA 7> Backup link type (def:PORT) ?
BACKUP CRITERIA 7> Link to back (def:NONE) ?
BACKUP CRITERIA 7> Phone entry index (1-64,def:1) ?
BACKUP CRITERIA 7> PPP User (def:NONE) ?
```

- For details on the *Mode* parameter, turn to [“Mode” on page 5-9](#).
- *Delay before call activation (sec)*, *Delay before call deactivation (sec)*, *Call activation timer (sec)* and *Dialer* are the same parameters that are used to configure link backup on a PVCR port. Refer to the [CALL-BKUP Mode](#) section of the appendix [SE/PORT/#/PVCR Configuration Parameters](#) in the [WAN/Leased Lines](#) module of this document series.
- For details on the *PPP backup criteria* parameter, turn to [“PPP backup criteria” on page 5-10](#). The **BACKUP CRITERIA** parameters are detailed in the section [“BACKUP CRITERIA Parameters” on page 5-15](#).

3.7.2 Answering Side

To configure the answering side of a PPP backup link:

1. At the NetPerformer command line prompt, enter the menu sequence:
 - **SE** ↓ **PORT** for a built-in serial port
 - **SE** ↓ **SLOT**, then the *Slot number* for a serial port on the Dual Serial interface card
 - **SE** ↓ **SLOT**, then the *Slot number* and **CHANNEL** for a channel on a digital interface card
2. Select the *Port number* or *Channel number*
3. Set the *Protocol* to **PPP**
4. Set the *Port clocking* to **SYNC** or **ASYNC**
ASYNC is available on serial ports only (either built-in or on the Dual Serial interface card)
5. Set the *Mode* to **ANSWER**
6. Set the *Dialer* to the same value that is configured on the **CALL-BKUP LINK** port at the other end of the connection (see previous section)
7. Leave the *PPP dial index* at its default value, **NONE**, unless an FRoIP IP route is used

8. For an FRoIP IP route, set:
 - *FRoIP IP link type*
 - *FRoIP IP link*
 - *FRoIP next hop*
9. Change the other port parameters from their default values, if desired. Refer to “[PPP Port/Channel Configuration Parameters](#)” on page 2-2.
 - For details on the *Mode* parameter, turn to “[Mode](#)” on page 5-9.
 - The *Dialer* parameter is used to configure link backup on a PVCr port. Refer to the *CALL-BKUP Mode* section of the appendix *SE/PORT/#/PVCr Configuration Parameters* in the *WAN/Leased Lines* module of this document series.
 - For details on the *PPP backup criteria* parameter, turn to “[PPP backup criteria](#)” on page 5-10. The **BACKUP CRITERIA** parameters are detailed in the section “[BACKUP CRITERIA Parameters](#)” on page 5-15.

**SE/PORT/#/
PPP example:
ANSWER
Mode, for
FRoIP**

```
SDM-9230>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PORT
Port number (ETH1/ETH2/CSL/1,def:ETH1) ? 1
PORT 1> Protocol (def:OFF) ? PPP
PORT 1> Port Clocking (def:ASYNC) ? SYNC
PORT 1> Interface.....DCE-V35
PORT 1> Clocking mode (def:INTERNAL) ?
PORT 1> Port speed (bps) (1200-6144000,def:56000) ?
PORT 1> CRC encoding (def:NRZ) ?
...
PORT 1> Filter (def:ALL) ?
PORT 1> Mode (def:DEDICATED) ? ANSWER
PORT 1> Dialer (def:DTR) ?
PORT 1> PPP backup criteria (def:1) ? 1
BACKUP CRITERIA 1> FRoIP IP link type (def:PORT) ?
BACKUP CRITERIA 1> FRoIP IP link (def:ETH1) ?
BACKUP CRITERIA 1> FRoIP next hop (def:005.000.001.062) ?
010.001.002.096
BACKUP CRITERIA 1> PPP User (def:NONE) ?
```




PPP over Ethernet (PPPoE)

- Resolves some problems that can occur when one router is installed behind another as a default gateway
- Avoids having to interface with a router that:
 - Does not have QoS
 - Buffers a lot of low-priority data coming from a lower speed upstream DSL router.
- Several NetPerformer units can use PPPoE on a shared Ethernet LAN to open PPP sessions to more than one destination via one or more bridging modems
- Preserves the session abstraction associated with PPP in a bridged Ethernet topology
- Provides a secure connection to the Internet with authentication.

4.2 How PPP over Ethernet Works

Ethernet connection is a cost effective way to access multiple hosts from a single location. When the PPPoE protocol is activated, the bridging capabilities of the NetPerformer allow point-to-point connection to a remote site via a network of hosts.

- Access control, billing functionality and type of service are available on a per-user, rather than a per-site basis
- Each host has its own PPP stack
- The same user interface is available for all sessions.

4.2.1 The PPPoE Session

When a PPPoE session is established, the NetPerformer encapsulates PPP packets over Ethernet. This brings standard PPP characteristics, which require a point-to-point relationship between peers, to the Ethernet environment, which has a multipoint relationship between peers. These PPP characteristics include:

- Link Control Protocol (LCP)
- Network-layer Control Protocols (NCP)
- Authentication.

Refer to the chapter “[NetPerformer PPP Support](#)” on page 1-1 for further information on these characteristics.

There are two distinct stages in establishing a PPPoE session:

- Discovery process, using the *discovery protocol*
- PPP session, when actual data transmission takes place.

4.2.2 Discovery Process

Although PPP typically implies a peer-to-peer relationship, the Discovery process is more like a client-server relationship, where a Host (client) discovers an *Access Concentrator* (server), or AC. The **NetPerformer operates as a client.**

NOTE: In the NetPerformer application, up to 32 *AC Names* can be defined on a single NetPerformer unit, thus permitting a maximum of 32 distinct client/server relationships at one time.

Session Information

To establish a point-to-point connection over Ethernet, PPPoE includes a discovery protocol that provides the NetPerformer with all information required to uniquely define the PPP session:

- Depending on your network structure and your NetPerformer unit configuration, the NetPerformer may communicate with more than one AC
- The Discovery process allows the NetPerformer to discover all available ACs, and then select one
- On successful completion of the Discovery process, both the NetPerformer and the selected AC have the information they need to build a point-to-point connection over Ethernet:
 - The Ethernet MAC address of the remote peer
 - A unique session identifier.

Ethernet Frame Structure Used

In the Ethernet frame used for PPPoE:

- The *Source Address* field contains the Ethernet MAC address of the source device.
- The *Destination Address* field contains:
 - For Discovery packets, either a unique unicast Ethernet destination address or the Ethernet broadcast address (0xFFFFFFFF)
 - For PPP session traffic, the unicast Ethernet destination address, as determined from the Discovery stage
- The payload contains:
 - The *Session ID* field, which provides a fixed value for the PPP session, the *Source Address* and *Destination Address*
 - The length of the PPPoE payload (excluding headers)
 - Zero or more TAGs that indicate the specific function of this Ethernet frame and/or the action that the NetPerformer or AC must perform.

Stages in the Discovery Process

The Discovery process is carried out as follows:

1. The NetPerformer broadcasts an *Initiation* packet (PADI) with:
 - The *Destination Address* set to the broadcast address
 - The *Session ID* set to zero (0x0000).
2. One or more ACs send *Offer* packets (PADO) in reply, including:
 - The *Destination Address* set to the unicast address of the NetPerformer that sent the PADI
 - The *Session ID* set to zero (0x0000)
 - TAGs that specify the AC (*AC Name*) and the service it offers (*Service Name*)

NOTE: Only those ACs that can actually serve the NetPerformer's *Initiation* packet will reply with an *Offer* packet.

3. The NetPerformer sends a unicast *Session Request* packet (PADR) to a specific AC:
 - It selects the AC based on its *AC Name or Service Name*
 - The *Destination Address* is set to the unicast Ethernet address of the selected AC
 - The *Session ID* is still set to zero (0x0000)
 - The *Session Request* packet also includes a TAG indicating the type of service the NetPerformer is requesting.
4. The selected AC sends a *Session Confirmation* packet (PADS) in reply, including:
 - The *Destination Address* set to the unicast Ethernet address of the NetPerformer
 - The *Session ID* is set to a unique value for this PPPoE session
 - A TAG that specifies under which service the AC has accepted the PPPoE session (*Service Name*).

NOTE: If the AC cannot accept the service that the NetPerformer requested, it indicates this error in a TAG and does not generate a Session ID.

4.2.3 PPP Session

The PPP Session begins once the *Session Confirmation* packet has been generated by the AC and received by the NetPerformer. At this stage, both the NetPerformer and the AC allocate resources for a PPP virtual interface.

PPP data is sent in the same way as for other types of PPP encapsulation:

- All Ethernet packets are unicast
- The Session ID remains unchanged for the entire session, at the value that was assigned during the Discovery process
- The PPPoE payload contains a PPP frame.

4.3 Configuring the NetPerformer for PPPoE

To set up a PPPoE session you need to configure:

- A PPPoE Profile entry for each AC that can be reached via the Ethernet LAN. Use the **PPPOE** submenu of the **SETUP** command. Refer to the next section.
- The required PPP User Profile entries, which govern authentication for the PPPoE session. Use the **PPPUSER** submenu of the **SETUP** command. The required procedure can be found in the section “[Configuring PAP/CHAP Authentication](#)” on page 2-11, and parameter details in the appendix “[SE/PPPUSER Configuration Parameters](#)” on page 6-1.

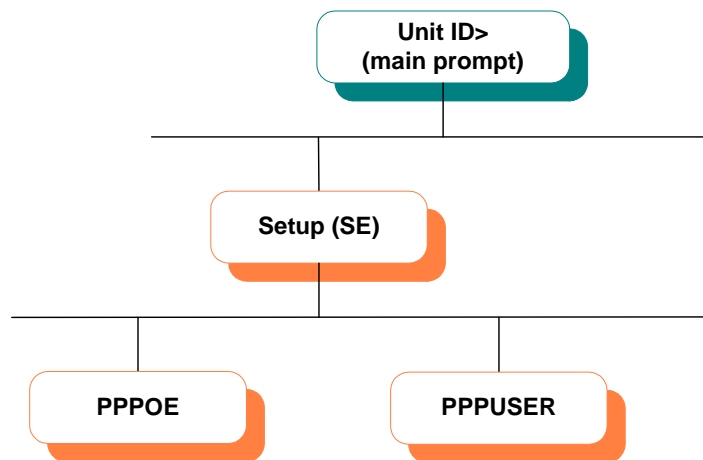


Figure 4-2: SETUP Commands in the CLI Tree for PPP over Ethernet

4.3.1 Configuring a PPPoE Profile

To configure the PPPoE entries, you can use:

- The **PPPOE** submenu of the **SETUP** console command
- The *pppoe* category if you are using SNMP
- The *[pppoe#]* heading for text-based configuration, where # represents the number of the PPPoE profile.

Console	SNMP	Text-based Config
SE/PPPOE	<i>pppoe</i> (category)	<i>[pppuser#]</i> (heading)

To configure a PPPoE entry:

1. At the NetPerformer command line prompt, enter the menu sequence: **SE ↵ PPPOE**
2. Select the *PPPoE number*
3. Set the *Mode* to **CLIENT**
4. Specify the *LAN port*

5. Change the other **PPPOE** parameters from their default values, if desired. Important parameters include:
 - *AC Name*
 - *Service Name*
 - *PPP User*. You must also configure the PPP User Profile entry as described in [“Configuring PAP/CHAP Authentication”](#) on page 2-11.
 - *Negotiate MRU*
 - *IP RIP*
 - *IP multicast active*.

SE/PPPOE example

```

9230-1>SE
SETUP
Item (BRIDGE/CALLER ID/CLASS/CUSTOM/FILTER/GLOBAL/HUNT/IP/IPX/MAP/
PHONE/
PORT/PU/PPPOE/PPPUSER/PVC/REDUNDANCY/SCHEDULE/SLOT/USER/VLAN,
def:BRIDGE) ? PPPOE
PPPoE number (1-32,def:1) ?
PPPoE 1> Mode (def:OFF) ? CLIENT
PPPoE 1> LAN port (def:ETH1) ? ETH2
PPPoE 1> AC Name (def:?) ? ANK2-CTRLPSTDOL
PPPoE 1> Service Name (def:?) ?
PPPoE 1> PPP User (def:NONE) ? 1
PPPoE 1> Silent (def:SEND REQUEST) ?
PPPoE 1> LCP timeout (seconds) (1-255,def:3) ?
PPPoE 1> LCP retries, 255 = forever (0-255,def:255) ?
PPPoE 1> Negotiate MRU (def:NO) ? YES
PPPoE 1> Proposed MRU (256-1492,def:1492) ?
PPPoE 1> Use MRU proposed by peer (def:NO) ? YES
PPPoE 1> Maximum accepted MRU from peer (256-1492,def:1492) ?
PPPoE 1> Request Magic Number (def:YES) ?
PPPoE 1> Accept Magic Number Request (def:YES) ?
PPPoE 1> Accept Addresses Old Negotiation (def:NO) ?
PPPoE 1> Request IP-Address (def:NO) ? YES
PPPoE 1> Accept IP-Address Request (def:NO) ?
PPPoE 1> Request DNS-Address (def:NO) ? YES
PPPoE 1> Accept DNS-Address Request (def:NO) ?
PPPoE 1> IP RIP (def:DISABLE) ? V1
PPPoE 1> IP RIP TX/RX (def: DUPLEX) ?
PPPoE 1> OSPF (def:DISABLE) ?
PPPoE 1> IP multicast active (def:NO) ?
PPPoE 1> NAT enable (def:NO) ?
PPPoE 1> TCP acceleration (def:NO) ?
PPPoE 1> Filter (def:ALL) ?

```

- *Silent, LCP timeout (seconds), LCP retries, Negotiate MRU, Proposed MRU, Use MRU proposed by peer, Maximum accepted MRU from peer, Request Magic Number, Accept Magic Number Request, Accept Addresses Old Negotiation, Request IP-Address, Accept IP-Address Request, Request DNS-Address and*

Accept DNS-Address Request are common to WAN/PPP ports, and are described in the appendix “[SE/PORT/#/PPP Configuration Parameters](#)” on page 5-1.

- *IP RIP, IP RIP TX/RX, OSPF, IP multicast active, NAT enable* and *Filter* are common to other WAN/user ports, and are described in the appendix [SE/PORT/#/PVCR Configuration Parameters](#) in the *WAN/Leased Lines* module of this document series. The *IP address* and *Subnet mask (number of bits)* parameters will also appear at the console if *Request IP-Address* is set to **NO**.
- The other parameters set specific PPPoE characteristics, and are detailed in the appendix “[SE/PPPOE Configuration Parameters](#)” on page 7-1.

4.4 Monitoring Functions for PPPoE

The following areas of the NetPerformer console command set provide information on how PPPoE is configured and how well it is performing in your network:

- To view the current values of configuration parameters, use the **PPPOE** and **PPPUSER** options of the Display Parameters (**DP**) command
- To view the status of a PPPoE session, use the **PPPOE** option of the Display States (**DS**) command
- For a display of PPPoE session status in real time, execute the Display PPPOE States (**DPPP**) command
- To view the alarms that have occurred on the NetPerformer unit, execute the Display Alarms (**DA**) command.

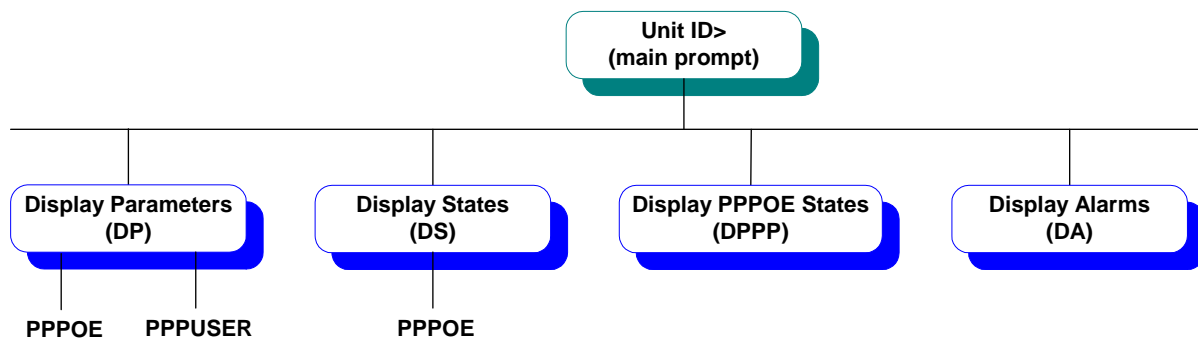


Figure 4-3: PPPoE Statistics Commands in the CLI Tree

DP/PPPOE example

```

9230-1>DP
DISPLAY PARAMETERS
SETUP
Item (BRIDGE/CLASS/CUSTOM/GLOBAL/IP/IPX/PORT/PPPOE/PPPUSER/SLOT/
USER/ALL,
def:BRIDGE) ? PPPOE
PPPoE number (1-32,def:1) ? 2
PPPoE 2> Mode.....CLIENT
PPPoE 2> LAN port.....ETH1
PPPoE 2> AC Name.....
PPPoE 2> Service Name.....
PPPoE 2> PPP User.....NONE
PPPoE 2> Silent.....SEND REQUEST
PPPoE 2> LCP timeout (seconds).....3
PPPoE 2> LCP retries, 255 = forever.....255
PPPoE 2> Negotiate MRU.....NO
PPPoE 2> Use MRU proposed by peer.....NO
PPPoE 2> Request Magic Number.....YES
PPPoE 2> Accept Magic Number Request.....YES
PPPoE 2> Accept Addresses Old Negotiation.....NO
PPPoE 2> Request IP-Address.....NO
PPPoE 2> Accept IP-Address Request.....NO
  
```

```

PPPoE 2> Request DNS-Address.....NO
PPPoE 2> Accept DNS-Address Request.....NO
PPPoE 2> IP address.....000.000.000.000
PPPoE 2> Subnet mask (number of bits).....8 {255.000.000.000}
PPPoE 2> IP RIP.....V1
PPPoE 2> IP RIP TX/RX.....DUPLEX
PPPoE 2> OSPF.....DISABLE
PPPoE 2> IP multicast active.....NO
PPPoE 2> NAT enable.....NO
PPPoE 2> Filter.....ALL

```

**DP/PPPUSER
example**

```

9230-1>DP
DISPLAY PARAMETERS
SETUP
Item (BRIDGE/CLASS/CUSTOM/GLOBAL/IP/IPX/PORT/PPPOE/PPPUSER/SLOT/
USER/ALL,
def:PPPOE) ? PPPUSER
PPPUSER number (1-32,def:1) ?
PPPUSER 1> PPPUSER active.....YES
PPPUSER 1> Incoming Authentication type.....NONE
PPPUSER 1> Outgoing Authentication type.....PAP
PPPUSER 1> Outgoing user name.....port8@mondolink.com
PPPUSER 1> Outgoing password.....min0s
PPPUSER 1> Authentication retries, 255 = forever 3
PPPUSER 1> Fail delay (minutes).....0
PPPUSER 1> Maximum challenge interval (minutes).60
PPPUSER 1> Authentication timeout (seconds).....10

```

**DS/PPPOE
example**

```

9230-1>DS
DISPLAY STATES
Item (GLOBAL/PORT/PPPOE/SLOT,def:GLOBAL) ? PPPOE
PPPoE 1> State.....DATA-DATA(orm7-
ctrlpstdak)

```

DPPP example

```

9230-1>DPPP
DISPLAY PPPOE STATES
-----
|  PPPOE#    PPPOE-STATE    PPP-STATE    Access Concentrator Name  |
|-----|-----|-----|-----|
|    1      DATA      DATA      ank2-ctrlpstdol          |
|    2      CALL      INIT                               |
|-----|-----|-----|-----|

```

Use HOME, END, UP and DOWN arrow keys to scroll. Press any other key to exit.

DA example


```

9230-1>DA
DISPLAY ALARMS
SDM-9230 vX.X.X Memotec Inc. (c) 2004
Signaling Engine vX.X.X Memotec Inc. (c) 2004
DSP code version: X.X.X
Console connected on port CSL
Time> WED 2004/04/14 14:12:00
Alarm> OUTBOUND AUTH FAILED, PPP LINK 1 WED 2004/04/14 14:11:58
Alarm> PPPoE 1 DOWN (PPPOE_1) WED 2004/04/14 14:11:53
Alarm> PPPoE 1 UP (PPPOE_1) WED 2004/04/14 14:11:36
Alarm> PPPoE 1 DOWN (PPPOE_1) WED 2004/04/14 14:11:29
Alarm> PPPoE 1 UP (PPPOE_1) WED 2004/04/14 14:11:09
Alarm> PPPoE 1 DOWN (PPPOE_1) WED 2004/04/14 14:11:03
Alarm> PPPoE 1 UP (PPPOE_1) WED 2004/04/14 14:10:58
Alarm> PPPoE 1 DOWN (PPPOE_1) WED 2004/04/14 14:06:51
Alarm> PPPoE 1 UP (PPPOE_1) WED 2004/04/14 13:17:19
Alarm> SOFT START (PWR) WED 2004/04/14 13:16:52
Alarm> LINK 1 DOWN (9230-2) WED 2004/04/14 13:16:23
Alarm> ALARMS CLEARED WED 2004/04/14 10:28:54

```




SE/PORT/#/PPP Configuration Parameters

 **Caution:** When a PPP port parameter is changed, a PPP negotiation procedure is immediately carried out. This causes a link down condition, during which time the link restarts with the new value of the parameter. Do not make PPP configuration changes during an active session.

5.1 SYNC Port Clocking

5.1.1 CRC encoding

Console	SNMP	Text-based Config
CRC encoding	ifwanCoding	[ifwan#] Coding

Bit coding for Cyclic Redundancy Check (CRC) purposes. For NRZ (normal) and NRZI coding the computed CRC is preset at **1**. For normal coding with CRC0 (NRZ-CRC0) and NRZI coding with CRC0 (NRZI-CRC0) the computed CRC is preset at **0**. The values NRZ-CRC0 and NRZI-CRC0 are available for the HDLC and PPP protocols only.

Note: *CRC encoding* is fixed at **NRZ** on a Dual Serial interface card on the SDM-9360, SDM-9380 or SDM-9585.

Values: NRZ, NRZI, NRZ-CRC0, NRZI-CRC0

Default: NRZ

5.1.2 Idle

Console	SNMP	Text-based Config
Idle	ifwanIdle	[ifwan#] Idle

Transmitter idle state, which determines the characters to be sent when no data frame is transmitted:

- **FLAG:** the transmitter continuously sends 7E (flags).
- **MARK:** the transmitter continuously sends **1**.
- **MARKD:** a 20-msec delay is added before the transmitter starts sending 1's.

Values: FLAG, MARK, MARKD

Default: FLAG

5.1.3 Frame delay (msec)

Console	SNMP	Text-based Config
Frame delay (msec)	ifwanFrameDelay	[ifwan#] FrameDelay

Delay, in milliseconds, added between each packet transmitted on the port. This delay is required by some DTE equipment operating at speeds higher than 56 Kbps.

Note: *Frame delay* is not supported on a Dual Serial interface card on the SDM-9360, SDM-9380 or SDM-9585.

Values: 0.0, 0.5, 1.0, 1.5, 2.0

Default: 0.0

5.1.4 PPP User

Console	SNMP	Text-based Config
PPP User	ifwanPppUser	[ifwan#] PppUser

Select the PPP User profile to be used for authentication purposes on this PPP port. This profile is defined using the **SETUP/PPPUSER** submenu. Refer to “[Configuring PAP/CHAP Authentication](#)” on page 2-11.

Note: The PPP User profile you select must be active.

Values: 1 - 32

Default: 1

5.1.5 Silent

Console	SNMP	Text-based Config
Silent	ifwanPppSilent	[ifwan#] PppSilent

This parameter defines how this port participates in the configuration negotiation process. When a PPP port is *Silent*, it waits for a Configure-Request packet from the remote peer. Use **WAIT FOR REQUEST** to configure the port in this way. The port must receive a request before it can negotiate a connection.

When a port is not *Silent*, it is actively trying to initialize the connection with the remote peer. Use the **SEND REQUEST** setting for this. The port will send Configure-Request packets in a timeout/retry sequence until the remote peer replies, at which point the two peers can negotiate the connection.

Values: SEND REQUEST, WAIT FOR REQUEST

Default: SEND REQUEST

5.1.6 LCP timeout (seconds)

Console	SNMP	Text-based Config
LCP timeout (seconds)	ifwanPppConfigRestart Timer	[ifwan#] PppConfigRestartTimer

(V.7.1.0 name: *Configuration Restart Timer*).

This parameter defines the duration, in seconds, of the Restart Timer, which is started when a Configure-Request or Terminate-Request packet is transmitted.

The Restart Timer is used to time responses to Configure-Request and Terminate-Request packets. If the timer expires, a timeout occurs, followed by retransmission of the packet if the value of the Configuration Restart Counter parameter is greater than 1.

Values: 1 - 255

Default: 3

5.1.7 LCP retries

Console	SNMP	Text-based Config
LCP retries	ifwanPppConfigRetries	[ifwan#] PppConfigRetries

(V.7.1.0 name: *Configuration Retries*)

This parameter is a restart counter for Configure-Requests. It defines the maximum number of successive attempts to send a Configure-Request packet to the remote peer, including the first attempt.

The port counts the number of Configure-Requests transmitted before receiving a Configure-Ack, Configure-Nak or Configure-Reject from the peer, until it assumes that the peer is unable to respond. The values 0 to 254 set a finite number of attempts. Use the value 255 to allow the port to send a Configure-Request packet an unlimited number of times.

Values: 0 - 255

Default: 255

5.1.8 Negotiate MRU

Console	SNMP	Text-based Config
Negotiate MRU	ifwanPppNegociateLocalMru	[ifwan#] PppNegociateLocalMru

(V.7.1.0 name: *Negotiate Local MRU with Peer*)

This parameter enables the negotiation of another MRU than the default MRU value (1500 bytes). The MRU is used when sending parameter values between peers to negotiate the connection. In particular, it specifies the maximum number of bytes in the Information and Padding fields of the PPP encapsulation frame.

If you set this parameter to **YES**, the port will send to the peer:

- Its receiving capability, if greater than the default MRU value, *or*
- A request that the peer restrict its frames to the local port's receiving capability, if less than the default MRU value.

Set this parameter to **NO** (the default value) when no MRU negotiation is required, that is, when the port has the default MRU of 1500 bytes. This indicates that the port is capable of receiving PPP frames with an unescaped information field of 1500 bytes.

If the peer acknowledges a negotiated MRU value, it agrees not to send frames that have an unescaped information field larger than this value. If the peer rejects the configuration request, or if the local port does not attempt to negotiate a non-default MRU value, the default MRU will be used locally.

Values: NO, YES

Default: NO

Note: If you set this parameter to **YES**, you must also configure the *Proposed MRU* parameter, shown in the example below.

```
PORT 1> Negotiate MRU (def:NO) ? YES
PORT 1> Proposed MRU (0-3000,def:1500) ?
```

5.1.9 Proposed MRU

Console	SNMP	Text-based Config
Proposed MRU	ifwanPppLocalMru	[ifwan#] PppLocalMru

(V7.1.0 name: *Negotiated Local MRU*)

This parameter determines the size of the MRU that the local port offers (if greater than the default value) or requests (if less than the default value) for use by the peer. The MRU specifies the maximum number of bytes allowed in the Information and Padding fields of the PPP encapsulation frame.

Values: 0 - 3000

Default: 1500

5.1.10 Use MRU proposed by peer

Console	SNMP	Text-based Config
Use MRU proposed by peer	ifwanPppNegociatePeerMru	[ifwan#] PppNegociatePeerMru

(V7.1.0 name: *Negotiate Peer's MRU*)

This parameter determines whether the port will consider either an offer for a larger MRU value or a request for a smaller one. Set this parameter to **YES** to allow the port to consider an MRU offer or request from the peer. Set it to **NO** (the default value) to reject it.

Values: NO, YES

Default: NO

Note: If you set this parameter to **YES**, you must also configure the *Maximum accepted MRU from peer* parameter, shown in the example below.

```
PORT 1> Use MRU proposed by peer (def:NO) ? YES
PORT 1> Maximum accepted MRU from peer (0-3000,def:1500) ?
```

5.1.11 Maximum accepted MRU from peer

Console	SNMP	Text-based Config
Maximum accepted MRU from peer	ifwanPppPeerMruUpTo	[ifwan#] PppPeerMruUpTo

(V7.1.0 name: Uses Peer's Offered MRU up to:)

This parameter determines up to what limit above the default MRU value the local port will set its MRU in response to an offer or request from the peer.

Values: 0 - 3000

Default: 1500

5.1.12 Request Magic Number

Console	SNMP	Text-based Config
Request Magic Number	ifwanPppRequestMagicNum	[ifwan#] PppRequest-MagicNum

This parameter determines whether the port will request the Magic Number from the remote peer. The Magic Number is a 4-byte field that aids in the detection of link loopback conditions and other data link layer anomalies. Set this parameter to **YES** (the default value) to request the peer's Magic Number. Set it to **NO** to disallow a Magic Number request.

Values: NO, YES

Default: YES

5.1.13 Accept Magic Number Request

Console	SNMP	Text-based Config
Accept Magic Number Request	ifwanPppAcceptMagicNum	[ifwan#] PppAccept-MagicNum

This parameter determines whether the port will accept a request from the remote peer to send the local Magic Number. Set this parameter to **YES** (the default value) to accept the peer's Magic Number request. Set it to **NO** to reject the request.

Values: NO, YES

Default: YES

5.1.14 Keepalive

Console	SNMP	Text-based Config
Keepalive	ifwanPppKeepalive	[ifwan#] PppKeepalive

Determines whether the NetPerformer will send standard PPP *keepalive* packets from this port in order to monitor the link status.

Values: DISABLE, ENABLE

Default: DISABLE

Note: If you set this parameter to **ENABLE**, you must also configure the *Keepalive period (msec)* and *Keepalive retries* parameters, shown in the example below.

```
PORT 1> Keepalive (def:DISABLE) ? ENABLE
PORT 1> Keepalive period (msec) (10-10000,def:3000) ?
PORT 1> Keepalive retries (1-20,def:5) ?
```

5.1.15 Keepalive period (msec)

Console	SNMP	Text-based Config
Keepalive period (msec)	ifwanPppKeepalivePeriod	[ifwan#] PppKeepalive-Period

Determines the interval of time, in milliseconds, during which the NetPerformer will send *keepalive* packets from this port to the remote device.

Values: 10 - 10000

Default: 3000

5.1.16 Keepalive retries

Console	SNMP	Text-based Config
Keepalive retries	ifwanPppKeepaliveRetries	[ifwan#] PppKeepaliveR-etries

This parameter specifies the maximum number of times that NetPerformer will continue to send *keepalive* packets without response before bringing the connection down.

Values: 1 - 20

Default: 5

5.1.17 Accept Addresses Old Negotiation

Console	SNMP	Text-based Config
Accept Addresses Old Negotiation	ifwanPppAcceptOldI-pAddNeg	[ifwan#] PppAcceptOldI-pAddNeg

(V7.1.0 name: *Accept Old IP-Addresses Negotiation*)

This parameter determines whether the port will accept a request from the remote peer to negotiate old IP-Addresses. Set this parameter to **YES** to accept the peer's IP-Addresses Negotiation request. The port will enter into an obsolete IP address negotiation with the peer. Set it to **NO** (the default value) to reject this configuration option.

Note: This option is supported only to provide compatibility with older systems. A NetPerformer will never initiate this type of negotiation.

Values: NO, YES

Default: NO

Request IP-Address

Console	SNMP	Text-based Config
Request IP-Address	ifwanPppNegociateIpAd- dress	[ifwan#] PppNegociateIp- Address

(V7.1.0 name: *Negotiate IP-Address*)

This parameter enables the negotiation of an IP Address with the remote peer IP-Address. Set this parameter to **YES** to allow the port to request and accept an IP Address. Set it to **NO** (the default value) to disallow IP address negotiation.

Note: For a PPPoE connection, if *Request IP-Address* is set to **NO**, you must specify the *IP address* and *Subnet mask* parameters, which will appear automatically after this parameter.

Values: NO, YES

Default: NO

5.1.18 Accept IP-Address Request

Console	SNMP	Text-based Config
Accept IP-Address Request	ifwanPppAcceptIpAdd- ress	[ifwan#] PppAcceptIpAd- dress

This parameter determines whether the port will accept a request from the remote peer to send an IP Address. Set this parameter to **YES** (the default value) to accept the peer's request for the local IP Address. Set it to **NO** to reject the request.

Values: NO, YES

Default: NO

Note: If you set the *Request IP-Address* and/or *Accept IP-Address Request* parameters to **YES**, you must also configure the *Remote IP-Address* parameter, as shown below.

```

PORT 1> Request IP-Address (def:NO) ? YES
PORT 1> Accept IP-Address Request (def:NO) ?
PORT 1> Remote IP-Address (def:000.000.000.000) ?

PORT 1> Request IP-Address (def:NO) ?
PORT 1> Accept IP-Address Request (def:NO) ? YES
PORT 1> Remote IP-Address (def:000.000.000.000) ?
    
```


5.1.19 Remote IP-Address

Console	SNMP	Text-based Config
Remote IP-Address	ifwanPppRemotelpAddress	[ifwan#] PppRemotelpAddress

This parameter defines the IP-Address to be sent to the remote peer during negotiation of the connection. The IP-Address is specific to a particular PPP session. It is a 4-byte value in dotted decimal representation, with a maximum value of 255 for each byte, for example 128.128.128.122.

Note: When this parameter is left at its default value, the NetPerformer sends an unnumbered IP address (0.0.0.0) to the remote peer.

Values: 000.000.000.000 - 255.255.255.255

Default: 000.000.000.000

Request DNS-Address

Console	SNMP	Text-based Config
Request DNS-Address	ifwanPppRequestDNS	[ifwan#] PppRequestDNS

Enables the negotiation of DNS addresses with the remote peer. Set this parameter to **YES** to allow the NetPerformer to request and accept a DNS address. The primary and secondary DNS addresses will be received from the peer. Set this parameter to **NO** (the default value) to disallow DNS address negotiation.

Values: NO, YES

Default: NO

5.1.20 Accept DNS-Address Request

Console	SNMP	Text-based Config
Accept DNS-Address Request	ifwanPppAcceptDNS	[ifwan#] PppAcceptDNS

Determines whether the NetPerformer will accept a request from the remote peer to send a DNS address. Set this parameter to **YES** to accept the peer's request for the local IP address. Set it to **NO** (the default value) to reject the request.

Values: NO, YES

Default: NO

5.1.21 Mode

Console	SNMP	Text-based Config
Mode	ifwanMode	[ifwan#] Mode

The operating mode of the PPP port. This parameter defines how the PPP port is activated:

- **DEDICATED:** Communication is carried out over a dedicated connection, and the PPP link is active as long as this connection is up.
- **ANSWER:** Answer mode, using either IP-triggered PPP backup or PPP link backup. The PPP link is activated when it receives a call from another NetPerformer unit.

When **ANSWER** mode is selected, the *Dialer* parameter is presented at the console. This parameter is also used to configure link backup on a PVCR port. For details, refer to the *CALL-BKUP Mode* section of the appendix *SE/PORT/#/ PVCR Configuration Parameters* in the *WAN/Leased Lines* module of this document series.

- **CALL-BKUP LINK:** Call mode, using the PPP link backup recovery mechanism. The PPP link is activated in case of a failure on one or more of the ports or PVCs that are designated to it.

Note: You can also activate a PPP backup link manually using the **CALL** command. Refer to the chapter *Manual Link Activation and Deactivation* in the *WAN/Leased Lines* module of this document series.

- When **CALL-BKUP LINK** mode is selected, the *Delay before call activation (sec)*, *Delay before call deactivation (sec)*, *Call activation timer (sec)* and *Dialer* parameters are presented at the console. These parameters are also used to configure link backup on a PVCR port.
- **CALL-BKUP IP:** Call mode, using the IP-triggered PPP backup recovery method. The PPP link is activated if a specific IP address is unreachable.

When **CALL-BKUP IP** mode is selected, the *Delay before call deactivation (sec)*, *Call activation timer (sec)* and *Dialer* parameters are presented at the console. These parameters are also used to configure link backup on a PVCR port.

Values: DEDICATED, ANSWER, CALL-BKUP LINK, CALL-BKUP IP

Default: DEDICATED

5.1.22 PPP backup criteria

Console	SNMP	Text-based Config
PPP backup criteria	backupCriteriaIndex	[ifwanBackupCriteria #] Index

This parameter indicates which **BACKUP CRITERIA** profile(s) to use for this port. The **BACKUP CRITERIA** parameters (see [page 15](#)) determine dialing characteristics for backup purposes. Sixteen distinct **BACKUP CRITERIA** profiles can be configured. You can select one or more of the configured **BACKUP CRITERIA** profiles to back up one or more destinations.

- If you set the *PPP backup criteria* parameter to a numeric value or range of values, the **BACKUP CRITERIA** parameters are displayed on the console. Refer to

“[PPP Backup Methods](#)” on page 3-1 for procedures to configure an IP-triggered backup link or a PPP backup link.

Note: More than one BACKUP CRITERIA index can be defined for a backup link that uses an AT- or V25-type *Dialer*, e.g. **1,3-6**. For a backup link that uses DTR or X21, **only one BACKUP CRITERIA index can be used**, e.g. **1**.

- If the *PPP backup criteria* is set to **NONE**, the PPP port operates in **DEDICATED** mode only, and no dialing characteristics are configured.

Values: **NONE**, **ALL**, **1 to 16**, a series of profile numbers separated by commas, or a range of profile numbers separated by a hyphen

Default: **NONE**

5.2 ASYNC Port Clocking

Asynchronous PPP parameters that are also used to define synchronous PPP are listed under [“SYNC Port Clocking”](#) on page 5-2.

5.2.1 Reception flow control

Console	SNMP	Text-based Config
Reception flow control	ifwanRxFlow	[ifwan#] RxFlow

Flow control on the receiver. This parameter defines the method used by the NetPerformer to control the flow of data received from the attached equipment. Flow control is applied when the number of characters on input exceeds a predefined threshold.

Values: NONE, XON_XOFF

Default: NONE

5.2.2 Transmission flow control

Console	SNMP	Text-based Config
Transmission flow control	ifwanTxFlow	[ifwan#] TxFlow

Flow control on the transmitter. This parameter defines the method used by the attached equipment to control the flow of data transmitted by the NetPerformer.

Values: NONE, XON_XOFF

Default: NONE

5.2.3 Transmit holding time (sec)

Console	SNMP	Text-based Config
Transmit holding time (sec)	ifwanTxHold-s	[ifwan#] TxHold-s

Hold time on the transmitter. This parameter defines the maximum time, in seconds, that the transmitter can be blocked due to flow control. There is no hold time limit if this parameter is configured as 0 seconds.

Values: 0 - 2000

Default: 0

5.2.4 Negotiate ACCM with peer (rcv)

Console	SNMP	Text-based Config
Negotiate ACCM with peer (rcv)	ifwanPppNegociateAccm	[ifwan#] PppNegociate-Accm

This parameter determines whether the port will inform the remote peer that it can enter into Asynchronous Control Character Map (ACCM) negotiation. This option provides a way to negotiate the use of control character mapping on asynchronous links.

By default, PPP maps all control characters into an appropriate two-character sequence. This is usually not necessary. The NetPerformer uses the ACCM negotiation option to inform the remote end which control characters must remain mapped, and which ones do not need to remain mapped when the remote end sends them.

Set this parameter to **YES** (the default value) to permit ACCM negotiation. Set it to **NO** to disallow this negotiation process.

Values: NO, YES

Default: YES

5.2.5 Requested ACCM characters

Console	SNMP	Text-based Config
Requested ACCM characters	ifwanPppRequestedAccmChar	[ifwan#] PppRequeste-dAccmChar

This parameter determines the exact characters of the Asynchronous Control Character Map that are requested from the remote peer Requested ACCM characters. The Async-Control-Character-Map field is 4 bytes long. It encoded such that each numbered bit corresponds to the ASCII control character of the same value. If a bit is cleared to zero, then the corresponding ASCII control character must remain mapped. For example, if bit 19 is set to zero, then ASCII control character 19 (CTRL-S) will not be changed during transmission.

Values: 00000000 - FFFFFFFF

Default: 000A0000

5.2.6 Accept ACCM negotiation from peer (xmt)

Console	SNMP	Text-based Config
Accept ACCM negotiation from peer (xmt)	ifwanPppAcceptAccmPeer	[ifwan#] PppAcceptAccmPeer

This parameter determines whether the port will accept a request from the remote peer to enter into Asynchronous Control Character Map (ACCM) negotiation. Set this parameter to **YES** (the default value) to accept the peer's request. Set it to **NO** to reject the request for ACCM negotiation.

Values: NO, YES

Default: YES

5.2.7 Acceptable ACCM characters

Console	SNMP	Text-based Config
Acceptable ACCM characters	ifwanPppAcceptableAccmChar	[ifwan#] PppAcceptableAccmChar

This parameter determines the exact characters of the Asynchronous Control Character Map that will be sent to the remote peer Requested ACCM characters. The Async-Control-Character-Map field is 4 bytes, encoded such that each numbered bit corresponds to the ASCII control character of the same value. If a bit is cleared to zero, then the corresponding ASCII control character must remain mapped. For example, if bit 19 is set to zero, then ASCII control character 19 (CTRL-S) may be sent without change.

Values: 00000000 - FFFFFFFF

Default: 000A0000

5.3 BACKUP CRITERIA Parameters

5.3.1 Backup IP address

Console	SNMP	Text-based Config
Backup IP address	backupCriteriaBackupIp-Address	[ifwanBackupCriteria #] BackupIpAddress

For CALL-BKUP IP mode only.

The IP address that is monitored for backup of the PPP link. If the NetPerformer cannot reach this address, it activates the dialup connection.

The *Backup IP address* is a 4-byte value in dotted decimal notation, with a maximum value of 255 for each byte. For further information about IP addressing, refer to the [LAN Connection and IP Networks](#) module of this document series.

Note: If you leave the *IP address* at its default value (**000.000.000.000**) it is considered **not defined**. IP-triggered PPP backup cannot take place in this case.

Values: 000.000.000.000 - 255.255.255.255

Default: 000.000.000.000

5.3.2 Phone number

Console	SNMP	Text-based Config
Phone number	backupCriteriaPhoneNumber	[ifwanBackupCriteria #] PhoneNumber

For CALL-BKUP IP mode only.

Defines the phone number that the NetPerformer will dial to set up an IP-triggered PPP backup connection.

Values: Maximum 16-character alphanumeric string: **0 - 9, D, T**, dash (-), comma (,), asterisk (*), space ()

Default: no value

5.3.3 Backup link type

Console	SNMP	Text-based Config
Backup link type	backupCriteriaBackupLink-Type	[ifwanBackupCriteria #] BackupLinkType

For CALL-BKUP LINK mode only.

Select the type of link that will be backed up by this PPP backup link:

- **PORT:** For serial ports or digital channels set to the **PPP** protocol
- **FR PVC:** For PVCs set to **PVCR** or **RFC1490** mode

- **ATM PVC:** For PVCs set to **ATMPPP**, **ATMPVCR** or **RFC1483** mode.

Note: The value **ATM PVC** is available only on a NetPerformer unit installed with the ATM licensed software option.

Values: PORT, FR PVC, ATM PVC

Default: PORT

5.3.4 Phone entry index

Console	SNMP	Text-based Config
Phone entry index	backupCriteriaPhonEntryIndex	[ifwanBackupCriteria #] PhonEntryIndex

For CALL-BKUP LINK mode only.

Select the PHONE Profile entry to be used for dialing. This profile is defined using the **SETUP/PHONE** submenu. Refer to the appendix [SE/PHONE Configuration Parameters](#) in the *WAN/Leased Lines* module of this document series.

Note: For a PPP backup link, only the *Dialer type* parameter (**MODEM** or **ISDN**) and related parameters are required for the PHONE Profile entry. The *Remote unit*, *Next hop* and *Cost* parameters are used for PVCR link backup, and are not required for a PPP link.

Values: 1 - 64

Default: 1

5.3.5 Link to back

Console	SNMP	Text-based Config
Link to back	backupCriteriaLinkToBack	[ifwanBackupCriteria #] LinkToBack

For CALL-BKUP LINK mode only.

The port or PVC that this PPP backup link will back up in case of failure.

- **Numeric value:** Enter the number of a specific port or PVC that is to be backed up by this PPP backup link. The backup link will be activated when the specified port or PVC goes down.

Note: To configure this PPP backup link to back up **more than one port or PVC**, the *PPP backup criteria* parameter must be set to **ALL**, a list of numbers separated by commas (for AT- or V25-type *Dialer* only), or a range of numbers separated by a hyphen (see [page 10](#)).

- **NONE:** The PPP backup link is not triggered by a specific port or PVC. Use this value to disable a backup PPP link.

Note: Since 16 distinct BACKUP CRITERIA profiles can be configured, a maximum of 16 ports/PVCs can be backed up using PPP link backup.

Values: **NONE**, automatically generated list of numeric values corresponding to the numbers of configured ports or PVCs

Default: **NONE**

5.3.6 PPP User

Console	SNMP	Text-based Config
PPP User	backupCriteriaUser	[ifwanBackupCriteria #] User

Select the PPP User profile to be used for authentication purposes on the dialup connection. This profile is defined using the **SETUP/PPPUSER** submenu. Refer to [“Configuring PAP/CHAP Authentication” on page 2-11](#), and the appendix [“SE/PPPUSER Configuration Parameters” on page 6-1](#) for details on the required parameters.

Note: The PPP User profile you select must be active.

Values: 1 - 32

Default: 1

5.3.7 FRoIP IP link type

Console	SNMP	Text-based Config
FRoIP IP link type	backupCriteriaFroipIpLink- Type	[ifwanBackupCriteria #] FroipIpLinkType

For CALL-BKUP LINK mode with an FRoIP connection only.

Select the type of link interface that this FRoIP connection uses:

- **PORT:** For serial (PVCR) or LAN (ETH) ports
- **FR PVC:** For Frame Relay PVCs and PVCR PVCs running FRoIP
- **ATM PVC:** For ATM PVCs.

Note: The value **ATM PVC** is available only on a NetPerformer unit installed with the ATM licensed software option.

Values: **PORT, FR PVC, ATM PVC**

Default: **PORT**

5.3.8 FRoIP IP link

Console	SNMP	Text-based Config
FRoIP IP link	backupCriteriaFroipIpLink	[ifwanBackupCriteria #] FroipIpLink

For CALL-BKUP LINK mode with an FRoIP connection only.

Defines the specific link interface that the NetPerformer will examine to determine whether the original FRoIP IP route is reachable.

Values: **NONE, ETH1, ETH2**, automatically generated list of numeric values corresponding to the numbers of configured ports or PVCs

Default: **NONE**

5.3.9 FRoIP next hop

Console	SNMP	Text-based Config
FRoIP next hop	backupCriteriaFroipNextHop	[ifwanBackupCriteria #] FroipNextHop

For CALL-BKUP LINK mode with an FRoIP connection only.

Defines the next hop that the NetPerformer will use when determining whether the original FRoIP IP route is reachable.

- Enter a 4-byte value in dotted decimal notation, with a maximum value of 255 for each byte.
- The IP address you specify must appear as an entry in the IP RIP routing table on the local NetPerformer.

Enter the menu sequence **DR** ↓ **IP** ↓ **UNICAST** ↓ **RIP** at the console command prompt to view all entries in this table.

Values: **000.000.000.000 - 255.255.255.255**

Default: **000.000.000.000**



SE/PPPUSER Configuration Parameters

6.1 PPPUSER number

Console	SNMP	Text-based Config
PPPUSER number	pppuserEntry, pppuserIndex	[pppuser#]

The number of the PPP User Profile entry that you want to configure. **You can configure 32 distinct PPP User Profile entries on each NetPerformer unit.**

- For SNMP, select the *pppuserEntry* table and look under the *pppuserIndex* for the desired PPP User profile.
- For text-based configuration, include the PPP User profile number, **#**, in the section heading.

At the console, the *PPPUSER number* you select will be displayed before each of the remaining PPP User profile parameters.

Values: 1 - 32

Default: 1

6.2 PPPUSER active

Console	SNMP	Text-based Config
PPPUSER active	pppuserActive	[pppuser#] Active

Set this parameter to **YES** to activate this PPP User profile. If this parameter is set to **NO**, the configured authentication rules will not be executed, even if a reference is made to this PPP User profile elsewhere in the NetPerformer configuration.

Values: **NO, YES**

Default: NO

6.3 Incoming Authentication type

Console	SNMP	Text-based Config
Incoming Authentication type	pppuserIncoming-PasswordType	[pppuser#] Incoming-AuthenticationType

Specifies the type of authentication used on an incoming call (ingress):

- **PAP:** Select this value for once-only authentication
- **CHAP (MD5):** Select this value for authentication at random intervals.
- **NONE:** No authentication is performed on an incoming call.

If this parameter is set to **PAP** or **CHAP (MD5)** the *Incoming user name* and *Incoming password* parameters are presented at the console.

Values: NONE, PAP, CHAP (MD5)

Default: NONE

6.4 Incoming user name

Console	SNMP	Text-based Config
Incoming user name	pppuserIncomingUser	[pppuser#] IncomingUser

User name when receiving an incoming call with PAP or CHAP authentication requirements. On the console, enter a single space to clear the parameter value.

Values: Maximum 48 characters

Default: none

6.5 Incoming password

Console	SNMP	Text-based Config
Incoming password	pppuserIncomingPass- word	[pppuser#] Incoming- Password

Password used when receiving an incoming call with PAP or CHAP authentication requirements. On the console, enter a single space to clear the parameter value.

Values: Maximum 16 characters

Default: none

6.6 Outgoing Authentication type

Console	SNMP	Text-based Config
Outgoing Authentication type	pppuserOutgoing-Pass- wordType	[pppuser#] Outgoing- AuthenticationType

Specifies the type of authentication used on an outgoing call (egress):

- **PAP:** Select this value for once-only authentication
- **CHAP:** Select this value for authentication at random intervals.

Values: NONE, PAP, CHAP (MD5)
Default: NONE

6.7 Outgoing user name

Console	SNMP	Text-based Config
Outgoing user name	pppuserOutgoingUser	[pppuser#] OutgoingUser

User name when initiating an outgoing call with PAP or CHAP authentication requirements. On the console, enter a single space to clear the parameter value.

Values: Maximum 48 characters
Default: none

6.8 Outgoing password

Console	SNMP	Text-based Config
Outgoing password	pppuserOutgoingPass- word	[pppuser#] Outgoing- Password

Password used when initiating an outgoing call with PAP or CHAP authentication requirements. On the console, enter a single space to clear the parameter value.

Values: Maximum 16 characters
Default: none

6.9 Authentication retries

Console	SNMP	Text-based Config
Authentication retries	pppuserAuthentication- Retries	[pppuser#] Authentica- tionRetries

Defines the number of times that an invalid password can be entered before the NetPerformer starts the *Fail delay* timer for this PPP User entry. This determines the number of retries permitted for incoming or outgoing calls.

Note: Enter **255** to allow the user to retry as many times as they want (forever). This has the effect of disabling the *Fail delay* timer.

Values: 0 - 255
Default: 3

6.10 Fail delay (minutes)

Console	SNMP	Text-based Config
Fail delay (minutes)	pppuserFailDelay	[pppuser#] FailDelay

Defines the delay, in minutes, that is triggered if the number of retries on incoming calls via the PPP port exceeds the value of the *Authentication retries* parameter.

- The NetPerformer will wait for duration of this delay before resuming normal operation of the PPP connection
- The AC that refers to this PPP User entry is forced into idle state for the duration of this delay, thereby reducing the risk of a password attack.

Values: 0 - 255

Default: 0

6.11 Maximum challenge interval (minutes)

Console	SNMP	Text-based Config
Maximum challenge interval (minutes)	pppuserMaximum-ChallengeInterval	[pppuser#] Maximum-ChallengeInterval

The maximum delay, in minutes, before a CHAP challenge is issued. The minimum delay is automatically set to $\frac{1}{4}$ of the maximum delay. The time between challenges varies, and may occur at any time between the minimum and maximum delay.

NOTE: This parameter takes effect only if the PPP User *Incoming Authentication type* or *Outgoing Authentication type* parameter is set to **CHAP (MD5)**. See [“Incoming Authentication type” on page 6-2](#).

Values: 1 - 255

Default: 60

6.12 Authentication timeout (seconds)

Console	SNMP	Text-based Config
Authentication timeout (seconds)	pppuserAuthentication-Timeout	[pppuser#] AuthenticationTimeout

The number of seconds that the NetPerformer will wait before assuming that an authentication response has been lost or was not issued for this PPP connection. This timeout applies to both PAP and CHAP authentication.

Values: 1 - 255

Default: 10



SE/PPPOE Configuration Parameters

7.1 About SE/PPPOE Configuration Parameters

PPPOE parameters that are common to PPP links are described in the appendix “[SE/PORT/#/PPP Configuration Parameters](#)” on page 5-1. Those that are common to other WAN/user ports are described in the appendix [SE/PORT/#/PVCR Configuration Parameters](#) in the [WAN/Leased Lines](#) module of this document series.

7.1.1 PPPoE number

Console	SNMP	Text-based Config
PPPoE number	pppoeEntry, pppoeIndex	[pppoe#]

The number of the PPPoE profile that you want to configure. **You can configure 32 distinct PPPoE profiles on each NetPerformer unit.**

- For SNMP, select the *pppoeEntry* table and look under the *pppoeIndex* for the desired PPPoE profile.
- For text-based configuration, include the PPPoE profile number, **#**, in the section heading.

At the console, the *PPPoE number* you select will be displayed before each of the remaining PPPoE profile parameters.

Values: 1 - 32

Default: 1

7.1.2 Mode

Console	SNMP	Text-based Config
Mode	pppoeMode	[pppoe#] Mode

Sets the mode that will be used when this PPPoE profile is activated.

NOTE: If you leave this parameter at its default value, **OFF**, no other PPPoE parameters are presented at the console, and this PPPoE profile is not activated.

Values: OFF, CLIENT

Default: OFF

7.1.3 LAN port

Console	SNMP	Text-based Config
LAN port	pppoeLANPort	[pppoe#] LANPort

Selects the LAN port that will carry the encapsulated PPP frames.

- Select **ETH** on NetPerformer products with one Ethernet port
- Select **ETH1** or **ETH2** on products with two Ethernet ports.

Values: On products with one Ethernet port: **ETH**
On products with two Ethernet ports: **ETH1, ETH2**

Default: On products with one Ethernet port: **ETH**
On products with two Ethernet ports: **ETH1**

7.1.4 AC Name

Console	SNMP	Text-based Config
AC Name	pppoeACName	[pppoe#] ACName

Defines the Access Concentrator name that will be:

- Included in all packets during the Discovery process (see [“Stages in the Discovery Process” on page 4-5](#))
- Used by the NetPerformer to select a specific destination for this PPPoE session.

Enter a name that will uniquely identify this Access Concentrator from all others in the network. If multiple servers are available, you can select the one you want to connect to.

NOTE: The *AC Name* can be left empty if only one AC is available on the Ethernet LAN segment.

Values: Maximum 16-character alphanumeric string

Default: no value

7.1.5 Service Name

Console	SNMP	Text-based Config
Service Name	pppoeServName	[pppoe#] ServName

Specifies the name of the service that can be performed by the AC defined for this PPPoE entry. Your service provider can specify which service name to connect to, if one is required. The NetPerformer uses the *Service Name* to select a specific destination for this PPPoE session. For details, refer to [“Stages in the Discovery Process” on page 4-5](#).

Values: Maximum 16-character alphanumeric string

Default: no value

7.1.6 PPP User

Console	SNMP	Text-based Config
PPP User	pppoeUser	[pppoe#] User

Select the PPP User profile to be used for authentication purposes. This profile is defined using the **SETUP/PPPUSER** submenu. Refer to [“Configuring PAP/CHAP Authentication” on page 2-11](#).

NOTE: The PPP User profile you select must be active.

Values: 1 - 32

Default: 1

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