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**RcPAX Network System**

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**X.25 DCE**

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**EM Reference Manual**

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**Keywords:**

RcPAX, RC5000 MegaSwitch, RC5000 Network Switch, EM, DCE.

**Abstract:**

Description of EM Operations for X.25.

**Date:**

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## 1. Introduction

This document describes the Entity Management (EM) Operations for X.25 Software Entity of the RC5000 MegaSwitch and the RC5000 Network Switch.

The EM operations described are implemented by X.25 version 6.149.

Later versions will normally be backward compatible.

The kernel EM Operations are described in:

- RcPAX Operating System
- Entity Management Kernel
- EM Reference Manual
- PN: 99001421

and are therefore not described in this document.

A number of the EM operations use the non-standard status bits (11-16). If an EM operation uses one or more of these bits, the precise usage is documented in the help text for the **request** of the operation.

The operations using non-standard status bits are listed below:

12, 14, 16, 28, 36, 45, 52, 60, 64, 113, 152, 156, 220, 252



## 2. Survey of all EM Operations.

### Operations

| <u>Number</u> | <u>Name</u>                   |
|---------------|-------------------------------|
| 0             | dce request survey            |
| 1             | Create DCE                    |
| 4             | set event bit mask            |
| 5             | get event bit mask            |
| 6             | get logical channel statistic |
| 7             | order events                  |
| 8             | restart DCE                   |
| 9             | get dce survey                |
| 11            | counterorder events           |
| 12            | clear logical channel         |
| 14            | get HDLC line statistics      |
| 15            | set snoop criteria            |
| 16            | reset logical channel         |
| 17            | sense timeout values          |
| 18            | Get buffer statistics         |
| 20            | set timeout value             |
| 24            | set default credit            |
| 25            | sense logical channel range   |
| 28            | create PVC                    |
| 29            | sense flow control neg.       |
| 33            | sense closed user group       |
| 36            | open HDLC line                |
| 37            | get default destination addr  |
| 40            | close HDLC line               |
| 41            | get current tariff            |
| 45            | sense HDLC state              |
| 49            | Get DCE buf-configuration     |
| 52            | initialize dce                |
| 53            | Get huntgroup description     |
| 55            | read em zone a                |
| 56            | set default window size       |
| 57            | Get redirection description   |
| 59            | read em zone b                |
| 60            | set default packet size       |
| 61            | get local charging prevention |
| 63            | read em zone old to new       |
| 64            | set flow control negotiation  |
| 65            | sense ats zone                |
| 67            | read em zone mask             |

|     |                               |
|-----|-------------------------------|
| 68  | cancel flow cntr negotiation  |
| 69  | sense buffers                 |
| 71  | read program version          |
| 72  | set throughput class neg.     |
| 75  | read incarnation parameters   |
| 76  | cancel throughput class neg   |
| 79  | read snoop criteria           |
| 80  | set default throughput class  |
| 83  | get events ordered            |
| 84  | set access barred             |
| 87  | get event groups              |
| 88  | set closed user group facil.  |
| 92  | initialize closed user group  |
| 96  | remove closed user group      |
| 100 | set fast select               |
| 104 | cancel fast select            |
| 108 | set fast select acceptance    |
| 112 | cancel fast select acceptance |
| 113 | sense logical channel         |
| 116 | set reverse charging          |
| 120 | cancel reverse charging       |
| 124 | set default destination addr. |
| 128 | set reverse charge acceptance |
| 132 | cancel reverse charge acc.    |
| 136 | set nui validation            |
| 140 | cancel nui validation         |
| 144 | change current tariff         |
| 148 | create account record event   |
| 149 | get lc survey from index      |
| 152 | measure transit delay         |
| 156 | Set DCE buf-configuration     |
| 160 | Set redirection               |
| 161 | Sense bcug                    |
| 164 | Cancel redirection            |
| 168 | Define huntgroup              |
| 172 | Cancel huntgroup              |
| 176 | Set transit delay             |
| 180 | Set called adr modified notif |
| 184 | Cancel called adr mod notif   |
| 188 | Set redirection notification  |
| 192 | Cancel redirection notific    |
| 196 | set local charging prevention |
| 200 | cancel local charging prevent |
| 204 | Set 80/84 vars (D-bit - 8084) |
| 205 | Get 80/84 vars (D-bit - 8084) |
| 208 | Charging information subscr   |
| 209 | sense poolhandler zone        |
| 212 | Cancel charging information   |
| 216 | set extended packet seq. num  |
| 220 | set receive limit             |
| 236 | Set default calling address   |
| 240 | set bcug facility subscript   |
| 244 | Initialize bcug membership    |
| 248 | Remove bcug membership        |
| 252 | init address translation      |
| 253 | ats pnuc activate             |

**Events**

| <u>Number</u> | <u>Name</u>                   |
|---------------|-------------------------------|
| 23            | call accepted from DTE        |
| 27            | clear confirmation from DTE   |
| 31            | indication establish lic      |
| 39            | HDLC line up                  |
| 43            | HDLC line down                |
| 47            | SCC indication answer         |
| 51            | HDLC line warning             |
| 55            | measured transit delay        |
| 59            | address translation respond   |
| 63            | incoming call to DTE          |
| 67            | call connected to DTE         |
| 71            | establish lic request         |
| 159           | PVC_removal_xcep              |
| 163           | A-end Account record          |
| 167           | B-end Account record          |
| 199           | diagnostic packet             |
| 203           | restart request from DTE      |
| 207           | call request from DTE         |
| 211           | clear request from DTE        |
| 215           | reset confirmation from DTE   |
| 219           | restart confirmation from DTE |
| 223           | reset request from DTE        |
| 227           | logical channel cleared       |
| 231           | logical channel reset         |
| 235           | restart indication            |
| 249           | snoop event                   |
| 253           | trace event                   |
| 254           | exception event               |
| 255           | events lost                   |



### 3. Control Operations.

#### 3. 1. restart DCE (8)

##### Request and Answer data

None.

##### Function

This LCP operation performs a software restart of the DCE module.

All unused buffers are returned to the HDLC.

Output-queues toward the DTE's are emptied.

All active channels are either cleared (virtual-calls) or reset (permanent virtual calls).

During these actions cause is 'local\_proc\_error' and diagnostic is 'ncc\_originated' (D128).

Having done these actions a 'restart-request' is issued on the line if the HDLC-state is connected.

#### 3. 2. clear logical channel (12)

##### Request and Answer data

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |

##### Function

This operation clears a specified logical channel.

It is checked if the specified channel is in an active state. If so the channel is cleared with cause 'local\_proc\_error' and diagnostic 'diag\_ncc\_orig' i.e. D5 and D128 in the clear indication to the DTE.

Both SVC's and PVC's can be cleared.

Use of non-standard status bits in answer:  
15: Logical channel zero

**Parameters**

logical channel number

Min-max: 1-4095 Std: 1

**3. 3. reset logical channel (16)****Request and Answer data**

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |

**Function**

This operation resets a specified logical channel.

It is checked whether the channel is active or not.  
If so a reset procedure is initiated.

During this procedure cause 'local\_procedure\_error' (D5)  
and diagnostic 'ncc\_originated' (D128) are used in the  
reset-indication to the DTE.

Use of non-standard status bits in answer:  
15: Logical channel zero

**Parameters**

logical channel number

Min-max: 1-4095 Std: 1

**3. 4. set timeout value (20)****Request and Answer data**

| <u>Field name</u>           | <u>Datatype</u> |
|-----------------------------|-----------------|
| timeout identifier          | num16           |
| new timeout value (seconds) | num16           |

**Function**

Set timeout value

Operation used to adjust DCE timers:

| id | timer              | explanation          |
|----|--------------------|----------------------|
| 0  | T10                | restart indication   |
| 1  | T11                | incoming call        |
| 2  | T12                | reset indication     |
| 3  | T13                | clear indication     |
| 4  | RR                 |                      |
| 5  | (establish LIC)    | call request         |
| 6  | (remove LIC)       | clear request        |
| 7  | (reset LIC)        | reset request        |
| 8  | (conf est LIC)     | accept incoming call |
| 9  | (send mes to LIC)  | interrupt            |
| 10 | (send data to LIC) | data                 |
| 11 | T14                | close down link      |

- 12 (send PVC-data to LIC) data
- 13 (send PVC-interrupt to LIC) interrupt

### Parameters

timeout identifier

Min-max: 0-11 Std: 0

new timeout value (seconds)

Min-max: 0-65535 Std: 60

## 3. 5. set default credit (24)

### Request and Answer data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| logical channel no. (0: all) | num16           |
| Start credit                 | num16           |
| Free queue                   | num16           |
| Accumulation limit           | num16           |

### Function

This operation enables you to set the net-credit (the window valid internally in the network) for either a specific logical channel or for all logical channels.

### Parameters

logical channel no. (0: all)

Min-max: 0-4095 Std: 0

#### Start credit

The value will only be used if the byte count is 4, and then it will be as close as possible to the old Set Lic start credit operation.

Start credit = number of credits sent to the remote end at start up.

Min-max: 0-16 Std: 7

#### Free queue

Number of buffers used to send data from the net to the DTE.

Min-max: 1-16 Std: 7

#### Accumulation limit

Credit are accumulated up to this limit before it is sent.

Min-max: 0-16 Std: 2

### 3. 6. create PVC (28)

#### Request and Answer data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| logical channel number        | num16           |
| remote net number             | num8            |
| remote region number          | num8            |
| remote node number            | num8            |
| remote extension number       | num16           |
| remote logical channel number | num16           |
| window size to DTE            | num8            |
| window size from DTE          | num8            |
| remote window size to DTE     | num8            |
| remote window size from DTE   | num8            |
| packet size to DTE (2**x)     | num8            |
| packet size from DTE (2**x)   | num8            |
| throughput class to DTE       | num8            |
| throughput class from DTE     | num8            |
| priority of the PVC           | num8            |
| charging at remote end        | num8            |
| x28 permanent                 | num8            |
| nui                           | text-fix        |
| Length of called adr          | num8            |
| Called address                | hex-df20        |

#### Function

This operation enables you to set up a permanent virtual circuit (PVC). Apart from specifying the endpoints of the connection the following can be specified :

    window-sizes

    packet-sizes

    throughput-classes

    HDLC-priority

    Account-relevant information like

- charge at A or B-end
- if an endpoint is X.28 permanent subscr.
- administrative NUI
- X.121 address at B-end

Use of non-standard status bits in answer:

12: Packet size larger than transmit/receive n1

13: Packet size larger than max. packet size in buffers

14: Channel state not p1

#### Parameters

**logical channel number**  
Local LCN of the PVC.

Min-max: 1-4095 Std: 1

**remote net number**

Min-max: 1-255 Std: 1

**remote region number**

Min-max: 1-255 Std: 1

**remote node number**

Min-max: 1-255 Std: 1

**remote extension number**

Min-max: 1-65535 Std: 1

**remote logical channel number**

Min-max: 1-4095 Std: 1

**window size to DTE**

Min-max: 1-7 Std: 2

**window size from DTE**

Min-max: 1-7 Std: 2

**remote window size to DTE**

Min-max: 1-7 Std: 2

**remote window size from DTE**

Min-max: 1-7 Std: 2

**packet size to DTE (2\*\*x)**

Min-max: 4-12 Std: 7

**packet size from DTE (2\*\*x)**

Min-max: 4-12 Std: 7

**throughput class to DTE**

Min-max: 3-15 Std: 15

**throughput class from DTE**

Min-max: 3-15 Std: 15

**priority of the PVC**

The specified value is converted via div 32  
to a valid HDLC-priority in the range (0-7).

The PVC is established using this HDLC-priority

Min-max: 0-255 Std: 0

**charging at remote end**

Specifies which end of the PVC is to be  
charged.

Min-max: 0-1 Std: 0

**x28 permanent**

Specifies if this end of the PVC is a permanent X.28 subscriber.

Min-max: 0-1 Std: 0

**nui**

A nui associated with this end of the pvc.  
The nui is not validated but will go into the account record and therefore can be used for administrative purposes.

Max chars: 8 Std:

**Length of called adr**

Min-max: 0-14 Std: 0

**Called address**

The called X.121 address can be specified here.  
The field will go into the account-record but will not be used when establishing the PVC.

Hex digits: 14 Std: 00000000000000

**3. 7. open HDLC line (36)****Request and Answer data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| 0,0,-s,-poll,inf,ecm,fin,auto | bit8            |
| retransm. timer, T1 (ms)      | num16           |
| no. of retransmissions (N2)   | num16           |
| no. of outstand. frames (k)   | num16           |
| min. flags between frames     | num16           |
| min. flags after abort        | num16           |
| n-poll                        | num16           |
| connect identification        | num16           |
| link reset recovery procedure | num8            |

**Function**

Explanation of mode-field:

mode = (rnr\_disc, auto\_return, no\_s\_commands, no\_poll, delay\_inf, extended\_connect\_message, final\_alarm, auto\_connect)

rnr\_disc : always false ie. line\_state is not changed at rnr\_timeout.

auto\_return : recommended true ie. all output-messages are returned when linestate is dis- or connecting

no\_s\_commands: recommended false ie no sup-cmds when timeout.

no\_poll: poll-bit or sup-cmds are not xmitted when timeout.

delay\_inf: after rej-frame received and after a linerreset

only one i-frame is xmitted until ack is received

extended\_connect\_message: if true the value for polling is read from the field 'n\_poll'.

final\_alarm : frmr is transmitted if an unsolicited response with f\_bit set is received.

auto\_connect:recommended true ie. line disconnects at error

Use of non-standard status bits in answer:

-----  
 Illegal\_State +11: Problems with get\_hdlc\_line  
 Illegal\_State +12: get\_hdlc\_line - no reservation  
 Illegal\_State +11,12: Already reserved  
 Illegal\_State +11,13: No communication with HDLC driver  
 Illegal\_State +11,14: Problems with sense version  
 Illegal\_State +11,15: Problems with disconn. immediately  
 Illegal\_State +11,16: Problems with return all  
 Illegal\_State +11,12,13: Problems with sense status  
 Illegal\_State +11,12,14: Problems with get events  
 Illegal\_State +11,12,15: Cannot clear COM204 event queue  
 Illegal\_State +11,12,16: HDLC mem layout - persistent error  
 Illegal\_State +11,12,13,14: HDLC mem layout - prot. not im-  
 plem  
 Illegal\_State +11,12,13,15: HDLC mem layout - other errors  
 Illegal\_State +11,12,13,16: HDLC control event  
 Illegal\_State +11,12,13,14,15: HDLC connect - other errors

No\_Free\_Resources +11: Cannot allocate pool  
 Out\_Of\_Range +11: HDLC mem layout - invalid parameter  
 Out\_Of\_Range +12: HDLC connect - invalid parameter

## Parameters

0,0,-s,-poll,inf,ecm,fin,auto  
 ecm : extended connect message.

Std: 01000111

retransm. timer, T1 (ms)

Min-max: 0-65535 Std: 1600

no. of retransmissions (N2)

Min-max: 0-65535 Std: 10

no. of outstand. frames (k)

Min-max: 1-128 Std: 7

min. flags between frames

Min-max: 0-65535 Std: 1

min. flags after abort

Min-max: 0-65535 Std: 1

n-poll

Min-max: 0-65535 Std: 10

**connect identification**

role of HDLC: 0: DTE

1: DCE

2: Symmetric (for loopback)

3: Unchanged (as last connect)

&gt;8: Alternating DTE/DCE

Min-max: 0-65535 Std: 1

**link reset recovery procedure**

1: reinitialize packet layer

2: -- not implemented yet

3: reset lc if data/flowc are level2 unacked

Min-max: 0-255 Std: 3

**3. 8. close HDLC line (40)****Request and Answer data**

None.

**Function**

This operation enables you to disconnect the HDLC-link.  
 A hdlc-disconnect message is issued to the HDLC and the  
 flow of input-buffers is stopped.  
 A hard-wait is performed for the return of the  
 hdlc-disconnect message.

**3. 9. initialize dce (52)****Request data**

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| no. of PVC's and DG channels | num16           |
| lower incoming channel       | num16           |
| higher incoming channel      | num16           |
| lower two ways channel       | num16           |
| higher two ways channel      | num16           |
| lower outgoing channel       | num16           |
| higher outgoing channel      | num16           |
| international prefix         | num8            |
| open HDLC line ?             | num8            |
| dce used for X.28 pad        | num8            |

**Answer data**

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| no. of PVC's and DG channels | num16           |
| lower incoming channel       | num16           |
| higher incoming channel      | num16           |
| lower two ways channel       | num16           |
| higher two ways channel      | num16           |
| lower outgoing channel       | num16           |
| higher outgoing channel      | num16           |
| international prefix         | num8            |
| open HDLC line               | num8            |
| dce used for X.28 pad        | num8            |

## Function

This operation initializes a DCE-module.

Among others the following is specified :

- channel-layout
- number of PVC's
- whether the subscriber is a public PAD
- whether the HDLC-line should be opened explicitly or as part of this initialization.
- a prefix for international calls can be specified (what is the use ???)

This operation is MANDATORY before using the DCE-module.

Use of non-standard status bits in answer:

## Parameters

**no. of PVC's and DG channels**

Min-max: 0-4095 Std: 0

**lower incoming channel**

Min-max: 0-4095 Std: 0

**higher incoming channel**

Min-max: 0-4095 Std: 0

**lower two ways channel**

Min-max: 0-4095 Std: 1

**higher two ways channel**

Min-max: 0-4095 Std: 10

**lower outgoing channel**

Min-max: 0-4095 Std: 0

**higher outgoing channel**

Min-max: 0-4095 Std: 0

**international prefix**

Min-max: 0-9 Std: 9

**open HDLC line ?**

Min-max: 0-1 Std: 1

**dce used for X.28 pad**

dce usage:  
0 for X.25

- 1 for X.28 PAD
- 2 for X.32 via PSTN

Min-max: 0-2 Std: 0

**dce used for X.28 pad**

dce usage:

- 0 DCE used for X.25
- 1 DCE used for X.28 PAD
- 2 DCE used for X.32 via PSTN

### 3. 10. set default window size (56)

#### Request and Answer data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| default window size to DTE   | num8            |
| default window size from DTE | num8            |

#### Function

This operation allows you to specify default values for the local DTE-DCE window-sizes (both directions).

#### Parameters

**default window size to DTE**

values 8..127 are only allowed if extended packet sequence numbering is used

Min-max: 1-127 Std: 2

**default window size from DTE**

values 8..127 are only allowed if extended packet sequence numbering is used

Min-max: 1-127 Std: 2

### 3. 11. set default packet size (60)

#### Request and Answer data

| <u>Field name</u>          | <u>Datatype</u> |
|----------------------------|-----------------|
| size to DTE (power of 2)   | num8            |
| size from DTE (power of 2) | num8            |

#### Function

This operation enables you to specify default values for the packet-sizes applying to this interface (both directions).

Use of non-standard status bits in answer:

- 11: Not pre-initialized.
- 12: Packet size larger than transmit/receive n1.
- 13: Packet size larger than max. packet size in buffers.

## Parameters

**size to DTE (power of 2)**

Min-max: 4-12 Std: 7

**size from DTE (power of 2)**

Min-max: 4-12 Std: 7

## 3. 12. set flow control negotiation (64)

### Request and Answer data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| max window size to DTE        | num8            |
| max window size from DTE      | num8            |
| max pack size to DTE (2**x)   | num8            |
| max pack size from DTE (2**x) | num8            |

### Function

This operation is used to enable flow control negotiation (negotiation of values for packet-size and window-size for each direction of a virtual call during call set-up)

Apart from the actual subscription to flow control negotiation some limit-values concerning the flow control parameters of this interface are specified.

Use of non-standard status bits in answer:

11: Not pre-initialized.

12: Packet size larger than transmit/receive n1.

13: Packet size larger than max. packet size in buffers.

## Parameters

**max window size to DTE**

values 8..127 are only allowed if extended packet sequence numbering is used.

Min-max: 1-127 Std: 7

**max window size from DTE**

values 8..127 are only allowed if extended packet sequence numbering is used.

Min-max: 1-127 Std: 7

**max pack size to DTE (2\*\*x)**

Min-max: 4-12 Std: 8

**max pack size from DTE (2\*\*x)**

Min-max: 4-12 Std: 8

### 3. 13. cancel flow cntr negotiation (68)

#### Request and Answer data

None.

#### Function

This operation is used for cancelling the subscription to flow control negotiation.

### 3. 14. set throughput class neg. (72)

#### Request and Answer data

None.

#### Function

This operation is used to enable throughput class negotiation (negotiation of values for throughput class for each direction of a virtual call during call set-up).

### 3. 15. cancel throughput class neg (76)

#### Request and Answer data

None.

#### Function

This operation cancels the subscription to throughput class negotiation.

### 3. 16. set default throughput class (80)

#### Request data

| <u>Field name</u>              | <u>Datatype</u> |
|--------------------------------|-----------------|
| def throughp to DTE, 15 =max   | num8            |
| def throughp from DTE, 15 =max | num8            |

#### Answer data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| def throughput class to DTE   | num8            |
| def throughput class from DTE | num8            |

#### Function

This operation enables you to specify default values for the throughput class parameters for this interface (both directions).

**Parameters****def throughp to DTE, 15=max**

Min-max: 0-15 Std: 15

**def throughp from DTE, 15=max**

Min-max: 0-15 Std: 15

**3. 17. set access barred (84)****Request and Answer data**

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| incoming calls barred (0=no) | num8            |
| outgoing calls barred (0=no) | num8            |

**Function**

This operation enables you to specify the following user facilities :

- incoming calls barred
- outgoing calls barred

**Parameters****incoming calls barred (0=no)**

Min-max: 0-255 Std: 0

**outgoing calls barred (0=no)**

Min-max: 0-255 Std: 0

**3. 18. set closed user group facil. (88)****Request and Answer data**

| <u>Field name</u>        | <u>Datatype</u> |
|--------------------------|-----------------|
| closed user group (cug)  | num8            |
| cug with outgoing access | num8            |
| cug with incoming access | num8            |

**Function**

This operation allows you to describe some facilities common to all the CUG-memberships for this interface.

The facilities are:

- ordinary CUG-membership
- outgoing access
- incoming access

If ordinary CUG-membership is specified none of incoming or outgoing access should be specified.  
If ordinary CUG-membership is not specified then one or both of incoming and outgoing access should be specified.

This request must be sent after 'initialize closed user group'.

## Parameters

### closed user group (cug)

Specifies ordinary CUG-membership.

0 =false

1 =true

Min-max: 0-1 Std: 0

### cug with outgoing access

Specifies outgoing access capability.

1 =true

0 =false

Min-max: 0-1 Std: 0

### cug with incoming access

Specifies incoming access capability.

1 =true

0 =false

Min-max: 0-1 Std: 0

## 3. 19. initialize closed user group (92)

### Request and Answer data

| <u>Field name</u>           | <u>Datatype</u> |
|-----------------------------|-----------------|
| closed user group number    | hex-df20        |
| internal cug number         | num32           |
| outgoing calls barred (cug) | num8            |
| incoming calls barred (cug) | num8            |
| preferential cug            | num8            |

### Function

This operation allows you to define a CUG-membership and some characteristics of this specific membership.

The characteristics are :

- Local identification of the CUG
- Global identification of the CUG
- Barring of outgoing calls when using CUG-facility
- Barring of incoming calls containing CUG-facility
- Whether this CUG is the preferential one or not.

Selection of barring of outgoing and incoming calls within a specific CUG is possible.

Simultaneous barring of outgoing and incoming calls should be avoided (why being a CUG-member at all ? ).

This request should be sent for each CUG defined for this interface . Operation 88 'set CUG facilities' must be sent after defining the CUG's.

## Parameters

### **closed user group number**

The local CUG number known by the DTE.

Hex digits: 4    Std: 0000

### **internal cug number**

The global CUG number that identifies the CUG uniquely in the network.

This number is known by all DCE's that belong to this CUG.

Min-max: 0-4294967295    Std: 0

### **outgoing calls barred (cug)**

Specifies whether members of this CUG are prohibited from making calls outside of the CUG.

1 =yes

0 =no

Min-max: 0-1    Std: 0

### **incoming calls barred (cug)**

Specifies whether members of this CUG are prohibited from receiving calls from outside the CUG.

1 =yes

0 =no

Min-max: 0-1    Std: 0

### **preferential cug**

Specifies whether this CUG is the preferential one or not.

1 =yes

0 =no

Min-max: 0-1    Std: 0

## 3. 20. remove closed user group (96)

### **Request and Answer data**

| <u>Field name</u> | <u>Datatype</u> |
|-------------------|-----------------|
|-------------------|-----------------|

|                          |
|--------------------------|
| closed user group number |
|--------------------------|

|          |
|----------|
| hex-df20 |
|----------|

### **Function**

The specified CUG is removed from the CUG-table in the DCE. It is only allowed to remove a CUG that is not preferential.

## Parameters

### **closed user group number**

The local CUG number as known by the DTE  
is to be supplied here.

Hex digits: 4    Std: 0001

## 3. 21. set fast select (100)

### **Request and Answer data**

None.

### **Function**

This operation activates a subscription to the fast select  
facility.

## 3. 22. cancel fast select (104)

### **Request and Answer data**

None.

### **Function**

This operation cancels the subscription to the fast select  
facility.

This means that call-requests containing the fast select  
facility will be cleared by the local DCE and not  
forwarded to the remote DTE/DCE interface.

## 3. 23. set fast select acceptance (108)

### **Request and Answer data**

None.

### **Function**

This operation activates a subscription to the  
fast select acceptance facility i.e. the interface  
accepts incoming calls with the fast select facility  
in the call-packet.

## 3. 24. cancel fast select acceptance (112)

### **Request and Answer data**

None.

### **Function**

This operation cancels the subscription to fast select  
acceptance.

This means that incoming calls containing the fast select

facility will be cleared by the DCE and not forwarded to DTE.

### 3. 25. set reverse charging (116)

#### Request and Answer data

None.

#### Function

This operation activates a subscription to the reverse charge facility i.e. the facility is allowed to appear in call-request packets.

### 3. 26. cancel reverse charging (120)

#### Request and Answer data

None.

#### Function

This operation cancels the subscription to the reverse charging facility.  
This means that a call-request packet containing the reverse charge facility will be cleared by the local DCE and not forwarded through the network.

### 3. 27. set default destination addr. (124)

#### Request and Answer data

| <u>Field name</u>           | <u>Datatype</u> |
|-----------------------------|-----------------|
| default destination address | text-fix        |

#### Function

This operation defines a default destination address.  
This address is put into the call-request packet when no destination address is specified by the DTE.

#### Parameters

**default destination address**  
A 14-digit address.

Max chars: 14 Std:

### 3. 28. set reverse charge acceptance (128)

#### Request and Answer data

None.

**Function**

This operation activates a subscription to reverse charge acceptance.

This means that the reverse charge facility will be allowed to appear in incoming calls and so will be forwarded to the DTE.

**3. 29. cancel reverse charge acc. (132)****Request and Answer data**

None.

**Function**

This operation cancels the subscription to the reverse charge facility.

This means that the appearance of the reverse charging facility will not be allowed in incoming calls but will result in a clearing of the call-attempt.

**3. 30. set nui validation (136)****Request and Answer data**

None.

**Function**

This operation activates a subscription to the NUI-validation procedure.

Call-packets are searched for the NUI-facility and the NUI is validated at the SCC.

When the NUI-validation procedure is subscribed to a call-attempt is cleared in the following cases :

- A NUI-facility is not present in the call-packet.
- The NUI is validated negatively at the SCC.

When the NUI-validation procedure is not subscribed to a call-attempt is cleared if the call-packet contains a NUI-facility.

When the NUI-validation procedure is activated it works for call-req packets.

For DCE's running a public PAD this procedure must be active

**3. 31. cancel nui validation (140)****Request and Answer data**

None.

**Function**

This operation cancels the subscription to the NUI validation procedure.  
This means that call-packets are not required to contain the NUI-facility.  
If a NUI-facility appears in a call-packet without the NUI-validation procedure being subscribed the call-attempt is cleared.

**3. 32. change current tariff (144)****Request and Answer data**

| <u>Field name</u>       | <u>Datatype</u> |
|-------------------------|-----------------|
| new tariff (1, 2, 3, 4) | num8            |

**Function**

This operation changes the tariff currently applicable to this interface.  
For all connections active at the moment, the account-information for the present tariff is saved and accounting for the new tariff is started.

**Parameters**

new tariff (1, 2, 3, 4)

Min-max: 1-4 Std: 0

**3. 33. create account record event (148)****Request and Answer data**

| <u>Field name</u>        | <u>Datatype</u> |
|--------------------------|-----------------|
| lower logical channel    | num16           |
| upper logical channel    | num16           |
| reset volume information | num8            |

**Function**

This operation results in the generation of account-records for the specified interval of logical channels.  
Account-records are only generated for those logical channels that are not idle.  
The account-information is reset if specified.

Only one of these interval-requests can be active at a time.

**Parameters**

lower logical channel

Min-max: 1-4095 Std: 1

**upper logical channel**

Min-max: 1-4095 Std: 1

**reset volume information**

Min-max: 0-1 Std: 1

**3. 34. measure transit delay (152)****Request data**

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |
| packet size            | num16           |

**Answer data**

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |
| packet size            | num16           |
| event sequence number  | num8            |

**Function**

This operation measures the network transit delay for one datapacket containing a specific number of random databytes.

The measurement works as follows :

- A datapacket with the specified number of databytes is sent on an existing virtual call by the local DCE.
- On seeing this measuring datapacket the remote DCE echoes the datapacket. The packet is not forwarded to the remote DTE.
- On seeing the echoed datapacket the local DCE stops the measurement and delivers the result (measured transit delay in msec) in event 55.
- The echoed datapacket is not forwarded to the local DTE.

Event 55 is enabled by setting bit16 (msb) in event mask.

Use of non-standard status bits in answer:

15: Logical channel zero.

**Parameters****logical channel number**

Logical channel number specifying the existing virtual connection on which the measurement is to be made.

Min-max: 1-4095 Std: 1

**packet size**

Number of databytes in the packet used for the measurement.

The databytes are not initialized i.e. they

must be considered to be random.

Min-max: 1-256 Std: 64

### 3. 35. Set DCE buf-configuration (156)

#### Request data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| Min no of rec-bufs at LIC     | num16           |
| Pref. no of rec-bufs at LIC   | num16           |
| No of headers in LIC          | num16           |
| Wait local indic bufs to LIC  | num16           |
| Max net credit                | num16           |
| No of HDLC event buffers      | num16           |
| Input-buffers at HDLC         | num16           |
| Buffers at poolhandler        | num16           |
| Max no of bufs DCE can use    | num16           |
| No of buffers in LIC          | num16           |
| Buffer size / Max. pac in buf | num16           |
| DTE version (1: 80, 0: 84)    | num8            |
| rec N1 (bytes)                | num16           |
| receive buffers               | num16           |
| transmit buffers              | num16           |
| rec test elem pr buf          | num16           |
| xmit test elem pr buf         | num16           |
| cntrl test elem pr buf        | num16           |
| test bufs                     | num16           |
| protocol                      | bit8            |
| xmit N1 (bytes).              | num16           |
| T3                            | num16           |

#### Answer data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| Min no of rec-bufs at LIC    | num16           |
| Pref. no of rec-bufs at LIC  | num16           |
| No of headers in LIC         | num16           |
| Wait local indic bufs to LIC | num16           |
| Max net credit               | num16           |
| No of HDLC event buffers     | num16           |
| Input-buffers at HDLC        | num16           |
| Buffers at poolhandler       | num16           |
| Max no of bufs DCE can use   | num16           |
| No of buffers in LIC         | num16           |
| Buffer size / Max pac in buf | num16           |
| DTE version (1: 80, 0: 84)   | num8            |
| rec N1 (bits)                | num16           |
| receive buffers              | num16           |
| transmit buffers             | num16           |
| rec test elem pr buf         | num16           |
| xmit test elem pr buf        | num16           |
| cntrl test elem pr buf       | num16           |
| test bufs                    | num16           |
| protocol                     | bit8            |
| xmit N1                      | num16           |
| T3                           | num16           |

## Function

Through this operation you can configure the buffer-resources of the DCE.

If used the operation must be used before the initialize operation.

Special care must be taken when defining 'buffers\_at\_poolhandler'.

If the default buffer configuration is insufficient the following is recommended :

'buffers\_at\_poolhandler' = 'pref no of rec\_bufs at LIC' +  
'input-buffers at HDLC' + 7\*no\_of\_LCN's\_configured

The DCE contains a configurable limit concerning the max no

of buffers it will fetch from the poolmanager. If the default is insufficient, the following is recommended:

'max no of bufs DCE can use' = 'bufs\_at\_poolman' + 10%  
Use of non-standard status bits in answer:

Data\_Error + Out\_Of\_Range + 11 : Receive n1 not multiple of 8,

i.e. not byte aligned.

Data\_Error + Out\_Of\_Range + 12 : Receive n1 not big enough for

the maximum frame.

Data\_Error + Out\_Of\_Range + 13 : The receive buffers cannot contain

rec\_n1 bits.

Data\_Error + Out\_Of\_Range + 14 : xmit\_n1 does not correspond to

integral no. of octets.

Data\_Error + Out\_Of\_Range + 15 : xmit\_n1 does not allow for the

max. I-frame currently configured.

## Parameters

### Min no of rec-bufs at LIC

The minimum number of buffer-resources outstanding at LIC (router) for receiving LIC-indications.

Min-max: 0-65535 Std: 2

### Pref. no of rec-bufs at LIC

Preferred number of buffer-resources outstanding at LIC (router) for receiving LIC-indications

Min-max: 0-65535 Std: 5

### No of headers in LIC

The number of headers in LIC must be greater than the number of buffers in LIC. The following is recommended :

#headers = 3 \* #buffers in LIC

Min-max: 0-65535 Std: 15

**Wait local indic bufs to LIC**

Min-max: 0-65535 Std: 1

**Max net credit**

Min-max: 1-16 Std: 4

**No of HDLC event buffers**

Number of buffers used for receiving HDLC-events.

Min-max: 0-65535 Std: 6

**Input-buffers at HDLC**

Number of buffer-resources outstanding at the HDLC for receiving data.

Min-max: 0-65535 Std: 4

**Buffers at poolhandler**

The total number of buffers ordered at the poolhandler.  
See recommended value at explanation to operation.

Min-max: 0-65535 Std: 16

**Max no of bufs DCE can use**

See recommended value in explanation to operation.

Min-max: 0-65535 Std: 24

**No of buffers in LIC**

These buffers are used internally in the LIC.  
They are used when sending the 'remove lic' operation.  
The value of this variable must be enlarged  
when many "concurrent" disconnections occur.

Min-max: 0-65535 Std: 5

**Buffer size / Max. pac in buf**

The size of the buffers used in communication  
with LIC and Router.

The value must be set to: (max packet size +3 +46) or the  
code for the maximum packet size that the buffer shall  
contain: 8..12

Min-max: 0-65535 Std: 305

**DTE version (1: 80, 0: 84)**

If the DTE is running X25 1980 the DCE may protect  
the DTE from input only allowed in 1984  
version.

Min-max: 0-65535 Std: 0

**rec N1 (bytes)**

N1 defined as bytes. Must be max packet size +  
layer 3 header.

Min-max: 0-65535 Std: 259

**receive buffers**

Min-max: 1-32767 Std: 7

**transmit buffers**

Min-max: 1-254 Std: 7

**rec test elem pr buf**

Min-max: 0-65535 Std: 16

**xmit test elem pr buf**

Min-max: 0-65535 Std: 16

**cntrl test elem pr buf**

Min-max: 0-65535 Std: 16

**test bufs**

Min-max: 0-65535 Std: 6

**protocol**

Std: 00000000

**xmit N1 (bytes).**

N1 defined as bytes. Must be max packet size +  
layer 3 header.

Min-max: 0-65535 Std: 259

**T3**

Min-max: 0-32767 Std: 0

**Buffer size / Max pac in buf**

The size of the buffers used in communication  
with LIC and Router.

The value must be set to: max packet size +  
3 +46 or to the code for the maximum packet  
size that the buffer shall contain: 8..12

**DTE version (1: 80, 0: 84)**

If the DTE is running X25 1980 the DCE may pro-  
tect the DTE from input only allowed in 1984  
version.

**rec N1 (bits)**

N1 as defined in X.25/2  
for received data

**xmit N1**

N1 as defined in X.25/2  
for transmitted data

**3. 36. Set redirection (160)****Request data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| Min no of rec-bufs at LIC     | num16           |
| Pref. no of rec-bufs at LIC   | num16           |
| No of headers in LIC          | num16           |
| Wait local indic bufs to LIC  | num16           |
| Max net credit                | num16           |
| No of HDLC event buffers      | num16           |
| Input-buffers at HDLC         | num16           |
| Buffers at poolhandler        | num16           |
| Max no of bufs DCE can use    | num16           |
| No of buffers in LIC          | num16           |
| Buffer size / Max. pac in buf | num16           |
| DTE version (1: 80, 0: 84)    | num8            |
| rec N1 (bytes)                | num16           |
| receive buffers               | num16           |
| transmit buffers              | num16           |
| rec test elem pr buf          | num16           |
| xmit test elem pr buf         | num16           |
| cntrl test elem pr buf        | num16           |
| test bufs                     | num16           |
| protocol                      | bit8            |
| xmit N1 (bytes).              | num16           |
| T3                            | num16           |

**Answer data**

| <u>Field name</u>         | <u>Datatype</u> |
|---------------------------|-----------------|
| Alternate destination-adr | text-fix        |

**Function**

Redirection is limited to one network.

Redirection is only allowed in one level.

This operation activates a subscription to redirection for this DCE/DTE interface, and defines the address to be redirected to (must be other than this DCE).

A call will be redirected to the specified address if the subscriber-interface is busy or the packet-level state is other than ready (r1).

Redirection to an address defined as a huntgroup-number is illegal.

A previous subscription to the huntgroup-facility will be cancelled by subscribing to redirection.

## Parameters

**Min no of rec-bufs at LIC**

The address to be used when redirecting.

Min-max: 0-32767 Std: 0

**Pref. no of rec-bufs at LIC**

Min-max: 0-32767 Std: 0

**No of headers in LIC**

Min-max: 0-32767 Std: 0

**Wait local indic bufs to LIC**

Min-max: 0-32767 Std: 0

**Max net credit**

Min-max: 0-32767 Std: 0

**No of HDLC event buffers**

Min-max: 0-32767 Std: 0

**Input-buffers at HDLC**

Min-max: 0-32767 Std: 0

**Buffers at poolhandler**

Min-max: 0-32767 Std: 0

**Max no of bufs DCE can use**

Min-max: 0-32767 Std: 0

**No of buffers in LIC**

Min-max: 0-32767 Std: 0

**Buffer size / Max. pac in buf**

Min-max: 0-32767 Std: 0

**DTE version (1: 80, 0: 84)**

Min-max: 0-32767 Std: 0

**rec N1 (bytes)**

Min-max: 0-32767 Std: 0

**receive buffers**

Min-max: 0-32767 Std: 0

**transmit buffers**

Min-max: 0-32767 Std: 0

**rec test elem pr buf**

Min-max: 0-32767 Std: 0

**xmit test elem pr buf**

Min-max: 0-32767 Std: 0

**cntrl test elem pr buf**

Min-max: 0-32767 Std: 0

**test bufs**

Min-max: 0-32767 Std: 0

**protocol**

Std:

**xmit N1 (bytes).**

Min-max: 0-32767 Std: 0

**T3**

Min-max: 0-32767 Std: 0

**3. 37. Cancel redirection (164)****Request and Answer data**

None.

**Function**

The subscription to redirection is cancelled for this interface.

**3. 38. Define huntgroup (168)****Request and Answer data**

| <u>Field name</u>          | <u>Datatype</u> |
|----------------------------|-----------------|
| Number of members in group | num8            |
| Lgt of 1. address          | num8            |
| 1. hunt address            | hex-df20        |
| Lgt of 2. address          | num8            |
| 2. hunt address            | hex-df20        |
| Lgt of 3. address          | num8            |
| 3. hunt address            | hex-df20        |
| Lgt of 4. address          | num8            |
| 4. hunt address            | hex-df20        |

|                  |          |
|------------------|----------|
| Lgt of 5. adress | num8     |
| 5. hunt adress   | hex-df20 |
| Lgt of 6. adress | num8     |
| 6. hunt adress   | hex-df20 |
| Lgt of 7. adress | num8     |
| 7. hunt-adress   | hex-df20 |
| Lgt of 8. adress | num8     |
| 8. hunt-adress   | hex-df20 |

## Function

The huntgroup is limited to 8 members (excl. this DCE-adr).  
 The members must all be within the same DNIC.  
 The DCE where the huntgroup is defined is default member of the huntgroup i.e. max 9 interfaces can be covered by one huntgroup.  
 Hunting is performed in one level only.  
 A previous redirection subscription is cancelled when subscribing to a huntgroup.

Presently it is possible for a huntgroup-member to subscribe to redirection.

This operation defines a huntgroup having the address of this DCE as huntgroup-address and the specified interfaces as huntgroup-members.  
 This DCE-adr cannot be specified as a huntgroup-member.

## Parameters

### Number of members in group

Min-max: 1-8 Std: 1

### Lgt of 1. adress

Min-max: 14-14 Std: 14

### 1. hunt adress

Hex digits: 14 Std: 0000000000000000

### Lgt of 2. adress

Min-max: 14-14 Std: 14

### 2. hunt adress

Hex digits: 14 Std: 0000000000000000

### Lgt of 3.adress

Min-max: 14-14 Std: 14

### 3. hunt adress

Hex digits: 14 Std: 0000000000000000

**Lgt of 4. adress**

Min-max: 14-14 Std: 14

**4. hunt adress**

Hex digits: 14 Std: 0000000000000000

**Lgt of 5. adress**

Min-max: 14-14 Std: 14

**5. hunt adress**

Hex digits: 14 Std: 0000000000000000

**Lgt of 6. adress**

Min-max: 14-14 Std: 14

**6. hunt adress**

Hex digits: 14 Std: 0000000000000000

**Lgt of 7. adress**

Min-max: 14-14 Std: 14

**7. hunt-adress**

Hex digits: 14 Std: 0000000000000000

**Lgt of 8. adress**

Min-max: 14-14 Std: 14

**8. hunt-adress**

Hex digits: 14 Std: 0000000000000000

**3. 39. Cancel huntgroup (172)****Request and Answer data**

None.

**Function**

This operation cancels the subscription to the huntgroup-functionality for this interface i.e. this DCE-adr does not act as a huntgroup-number any more.

### 3. 40. Set transit delay (176)

#### Request and Answer data

| <u>Field name</u>   | <u>Datatype</u> |
|---------------------|-----------------|
| Dummy transit delay | num16           |

#### Function

This operation defines a dummy value for transit delay.  
This operation is also considered a subscription to the transit delay indication facility.

#### Parameters

Dummy transit delay

Min-max: 0-65535 Std: 1

### 3. 41. Set called adr modified notif (180)

#### Request and Answer data

None.

#### Function

This operation subscribes to the use of the 'called line address modified notification'.

This facility will be sent to the calling DTE in either a clear\_request or a call\_connected packet indicating a reason for the facility.

The reasons can be:

- call distribution within a huntgroup. (7)
- call redirection due to called DTE out of order. (9)
- call redirection due to called DTE busy. (1)
- call redirection due to systematic redirection by called DTE. (15)
- DTE originated. (>127)

### 3. 42. Cancel called adr mod notif (184)

#### Request and Answer data

None.

#### Function

This operation cancels the use of the 'called line address modified notification'- facility.  
Can be necessary when originating DTE is at 1980-level

### 3. 43. Set redirection notification (188)

#### Request and Answer data

None.

#### Function

This operation subscribes to the use of the 'call redirection notification' facility.

The facility is used in incoming\_call packets to inform the alternate DTE that the call has been redirected.

As additional information a reason for the redirection and the originally called DTE-address is contained in the incoming\_call packet.

The reasons for redirection are :

- originally called DTE busy (1)
- originally called DTE out of order (9)
- systematic call redirection (15)

### 3. 44. Cancel redirection notific (192)

#### Request and Answer data

None.

#### Function

This operation cancels the default subscription to the redirection notification facility.

The use of this operation can be necessary for handling DTE's complying to X.25 1980.

### 3. 45. set local charging prevention (196)

#### Request and Answer data

None.

#### Function

This operation activates a subscription to the optional user facility 'local charging prevention'.

This subscription authorizes the DCE to prevent establishment of virtual calls that the subscriber must pay for.

The methods used to implement this facility are:

- not transmitting to the DTE incoming calls that contains the reverse charge facility.
- making sure that call-request packets always contain the reverse charge facility when transmitted from the DCE into the network.

### 3. 46. cancel local charging prevent (200)

#### Request and Answer data

None.

**Function**

This operation deactivates the subscription to local charging prevention.

Hereafter virtual calls for which the subscriber must pay for can be established.

**3. 47. Set 80/84 vars (D-bit - 8084) (204)****Request and Answer data**

| <u>Field name</u>       | <u>Datatype</u> |
|-------------------------|-----------------|
| D-bit modification on   | num8            |
| Version 80/84 select on | num8            |
| Local DTE version 80/84 | num8            |
| M-bit facility on       | num8            |
| Retransmission on       | num8            |
| Dummy                   | num8            |

**Function**

No help text for this operation

**Parameters****D-bit modification on**

- 0 =D-bit modification procedure disabled
- 1 =D-bit modification procedure enabled

Min-max: 0-1 Std: 0

**Version 80/84 select on**

- 0 =version 80/84 selection disabled
  - 1 =version 80/84 selection enabled
- This facility should first be enabled when all DCE's is able to interchange their DTE version as a private facility. When OFF - as before.

Min-max: 0-1 Std: 1

**Local DTE version 80/84**

- 0 =version 84 local DTE
- 1 =version 80 local DTE
- 80 =version 80 local DTE
- 84 =version 84 local DTE

Min-max: 0-84 Std: 84

**M-bit facility on**

- 0 =M-bit facility disabled
  - 1 =M-bit facility enabled
- This facility should first be enabled when all DCE's is able to support the M-bit facility.

Min-max: 0-1 Std: 0

**Retransmission on**

0 =Retransmission disabled  
1 =Retransmission enabled

Min-max: 0-1 Std: 0

**Dummy**

Min-max: 1-16 Std: 16

**3. 48. Charging information subscr (208)****Request and Answer data**

None.

**Function**

This operation activates a subscription to charging information.

This means that upon clearing of a virtual circuit this DCE will be notified of the resources used since the latest generation of an account-record.

The notification will consist of facilities contained in clear-indication or clear-confirmation packets and will only be issued to the end being charged.

Presently charge information consists of segment-count and call-duration.

Charging information can also be requested without subscrip

tion on a per call basis. Request is only allowed in call-request and call-confirmation packets.

Relevant facility codes:

charging info - segment count : hex(c2)

charging info - call duration : hex(c1)

requesting charging info : hex(04)

**3. 49. Cancel charging information (212)****Request and Answer data**

None.

**Function**

This operation cancels the subscription to the charging information facility.

**3. 50. set extended packet seq. num (216)****Request and Answer data**

None.

**Function**

No help text for this operation

### 3. 51. set receive limit (220)

#### Request and Answer data

| <u>Field name</u>           | <u>Datatype</u> |
|-----------------------------|-----------------|
| logical channel no. (0:all) | num16           |
| receive limit               | num8            |

#### Function

Use of non-standard status bits in answer:  
15: Logical channel zero.

#### Parameters

logical channel no. (0:all)

Min-max: 0-4095 Std: 0

receive limit

Min-max: 1-127 Std: 7

### 3. 52. Set default calling address (236)

#### Request and Answer data

| <u>Field name</u>           | <u>Datatype</u> |
|-----------------------------|-----------------|
| default destination address | text-fix        |

#### Function

This operation activates a subscription to a special default calling address.

For all calls originating from this DCE the X25 field 'calling address' will be set to the address specified.

#### Constraints :

The length of the specified address must be even and not greater than 14.

#### Note :

This operation is only meant to be used in association to define hunt-group (DCE,r,168) to secure that members of a hunt-group uses the same calling-address when originating calls.

#### Parameters

default destination address

A 14-digit address.

Max chars: 14 Std:

### 3. 53. set bcug facility subscript (240)

#### Request and Answer data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| bilateral cug subscription   | num8            |
| bcug w. outgoing access sub. | num8            |

#### Function

The bilateral closed user group subscription of the DTE.

#### Parameters

**bilateral cug subscription**  
Set subscription on or off.

Min-max: 0-1 Std: 0

**bcug w. outgoing access sub.**  
Set subscription on or off.

Min-max: 0-1 Std: 0

### 3. 54. Initialize bcug membership (244)

#### Request and Answer data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| Local bcug number             | hex-df20        |
| Internal bcug number          | num32           |
| Addr lgt of the other member  | num8            |
| X.121 addr of the other membr | hex-df20        |

#### Function

No help text for this operation

#### Parameters

**Local bcug number**  
MIN =1, MAX =9999

Hex digits: 4 Std: 0001

**Internal bcug number**

Min-max: 0-4294967295 Std: 0

**Addr lgt of the other member**

Min-max: 5-14 Std: 14

**X.121 addr of the other membr**

Hex digits: 14 Std: 0000000000000000

### 3. 55. Remove bcug membership (248)

#### Request and Answer data

| <u>Field name</u> | <u>Datatype</u> |
|-------------------|-----------------|
| Local bcug number | hex-df20        |

#### Function

No help text for this operation

#### Parameters

**Local bcug number**  
MIN =1, MAX =9999

Hex digits: 4    Std: 0001

### 3. 56. init address translation (252)

#### Request and Answer data

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| validate calling       | num8            |
| logical addressing     | num8            |
| pnic                   | hex-df20        |
| own address length     | num8            |
| x121 dce address       | hex-df20        |
| number of ats messages | num8            |
| ats server incarnation | num16           |

#### Function

Use of non-standard status bits in answer:  
11: ats\_pnic\_activate failed.

#### Parameters

##### **validate calling**

if equal to 1 then validate calling else  
act like a normal dce with one dte connected

Min-max: 0-1    Std: 0

##### **logical addressing**

if equal to 1 then use logical addressing, ie  
query the ats for router information, else  
use the old paxnet addressing format

Min-max: 0-1    Std: 0

##### **pnic**

private network identification code  
this field is only used if validate calling  
is enabled

Hex digits: 4    Std: 0000

**own address length**

length of the dce's own address  
this field is only used if logical addressing  
is enabled

Min-max: 0-14 Std: 0

**x121 dce address**

the x121 address of this dce  
this field is only used if logical addressing  
is enabled

Hex digits: 14 Std: 00000000000000

**number of ats messages**

the number of messages to allocate in the ats  
zone

Min-max: 0-255 Std: 32

**ats server incarnation**

the incarnation number of the ats server

Min-max: 0-65535 Std: 0

### 3. 57. ats pn timer activate (253)

**Request data**

| <u>Field name</u>    | <u>Datatype</u> |
|----------------------|-----------------|
| 0 =remove, 1 =upload | num8            |

**Answer data**

| <u>Field name</u> | <u>Datatype</u> |
|-------------------|-----------------|
| pn timer          | hex-df20        |

**Function**

No help text for this operation

**Parameters**

0 =remove, 1 =upload

Min-max: 0-1 Std: 1

**pn timer**

private network identification code  
the pn timer which was uploaded/removed  
by the module



## 4. Sense Operations.

### 4. 1. get dce survey (9)

#### Request data

| <u>Field name</u>     | <u>Datatype</u> |
|-----------------------|-----------------|
| first logical channel | num16           |
| last logical channel  | num16           |

#### Answer data

| <u>Field name</u>                    | <u>Datatype</u> |
|--------------------------------------|-----------------|
| closed, HDLC state (cl, up, dis)     | hex-df20        |
| DCE state (r0, r1, r2, r3_1, r3)     | num8            |
| HDLC line number                     | num8            |
| ....., crn, can                      | bit8            |
| rc, rca, fs, fsa, fcn, tcn, icb, ocb | bit8            |
| maximum throughput class             | num8            |
| active closed user groups            | num8            |
| own DNIC                             | hex-df20        |
| own Network Terminal Number          | hex-df20        |
| no. of active log. channels          | num16           |
| 1. logical channel number            | num16           |
| channel type (VC, PVC, DG)           | num8            |
| channel state                        | num8            |
| .....                                |                 |

#### Function

This operation requests a survey of active logical channels in the DCE, the state of the DCE and the subscribed facilities.

The operation can be used with bytecount 0, 2 or 4 meaning :

- 0 : survey containing all active logical channels.
- 2 : survey containing one specified logical channel.
- 4 : survey containing a specified interval of logical channels.

#### Parameters

**first logical channel**

Min-max: 1-4095 Std: 1

**last logical channel**

Min-max: 1-4095 Std: 8

**closed, HDLC state (cl, up, dis)**

closed = 1 : HDLC line closed by NMC

HDLC state :

cl : 0 : closed

up : 1 : connected

dis : 2 : disconnected

**DCE state (r0, r1, r2, r3\_1, r3)**

0 : r0, init DCE, HDLC line disconnected

1 : r1, Packet level READY

2 : r2, DTE restart request

3 : r3\_1, init DCE, HDLC line up

4 : r3, DCE restart indication

**cm, can**

cm : call-request nui validation

can : call-accept nui validation

**rc, rca, fs, fsa, fcn, tcn, icb, ocb**

rc: reverse charge, rca: reverse charge acceptance

fs: fast select, fsa: fast select acceptance,

fcn: flow control neg, tcn: throughput class neg,

icb: incoming calls barred, ocb: outgoing calls

barred

**maximum throughput class**

4 : 110 bps, 5 : 300 bps, 6 : 600 bps,

7 : 1200 bps, 8 : 2400 bps, 9 : 4800 bps,

10 : 9.6 Kbps, 11 : 19.2 Kbps, 12 : 48 Kbps,

13 : 64 Kbps.

Other values : line-speed measure not successful

**active closed user groups**

Actual number of closed user group-memberships  
defined for this interface.

**channel type (VC, PVC, DG)**

0 : VC

1 : PVC

2 : DG

**channel state**

A description of channel states is found  
in the explanation text to this operation  
(DCE, 9, a)

**channel type (VC,PVC,DG)**

0 : VC  
 1 : PVC  
 2 : DG

**channel state**

A description of channel states is found  
 in the explanation text to this operation  
 (DCE,9,a)

**channel type (VC,PVC,DG)**

0 : VC  
 1 : PVC  
 2 : DG

**channel state**

A description of channel states is found  
 in the explanation text to this operation  
 (DCE,9,a)

**4. 2. sense timeout values (17)****Request data**

None.

**Answer data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| restart (t10)                 | num16           |
| incoming call (t11)           | num16           |
| reset indication (t12)        | num16           |
| clear indication (t13)        | num16           |
| data or RR to DTE             | num16           |
| call request (establish LIC)  | num16           |
| clear request (remove LIC)    | num16           |
| reset request (reset LIC)     | num16           |
| acc. inc. call (cf. est. LIC) | num16           |
| interrupt (send LIC message)  | num16           |
| data (send LIC data)          | num16           |
| internal DCE tick period      | num16           |
| close down link (T14)         | num16           |
| PVC-data-timer (LIC)          | num16           |
| PVC-interrupt-timer (LIC)     | num16           |

**Function**

This operation gets the actual timeout-values  
 for the timers specified in the answer-record  
 all the values are in seconds.

## Parameters

### close down link (T14)

Timer T14 is used in the X32 DCE, as the "idle" time, until the hdlc and the physical link is closed down from the DCE side.

### PVC-data-timer (LIC)

This timer is equivalent to 'data-timer'. It is used when sending data to the LIC on a PVC.

### PVC-interrupt-timer (LIC)

This timer is equivalent to 'interrupt-timer'. It is used when sending an interrupt to the LIC on a PVC.

## 4. 3. sense logical channel range (25)

### Request data

None.

### Answer data

| <u>Field name</u>       | <u>Datatype</u> |
|-------------------------|-----------------|
| no. of PVC's            | num16           |
| lower incoming channel  | num16           |
| higher incoming channel | num16           |
| lower two ways channel  | num16           |
| higher two ways channel | num16           |
| lower outgoing channel  | num16           |
| higher outgoing channel | num16           |

### Function

This operation gets the present layout of logical channels divided into :

- PVC's
- lower incoming
- higher incoming
- lower two-ways
- higher two-ways
- lower outgoing
- higher outgoing

## 4. 4. sense flow control neg. (29)

### Request data

None.

### Answer data

| <u>Field name</u>          | <u>Datatype</u> |
|----------------------------|-----------------|
| default window size to DTE | num8            |

|                               |      |
|-------------------------------|------|
| default window size from DTE  | num8 |
| def pack size to DTE (2**x)   | num8 |
| def pack size from DTE (2**x) | num8 |
| flow control negotiation?     | num8 |
| max window size to DTE        | num8 |
| max window size from DTE      | num8 |
| max pack size to DTE (2**x)   | num8 |
| max pack size from DTE (2**x) | num8 |

### Function

This operation gets the relevant values for the flow-control parameters (window- and packet-size).

If flow-control negotiation is not subscribed to the operation returns the default values for window- and packet-size for both directions.

If flow-control negotiation is subscribed to the operation will additionally return the negotiated values for window- and packet-size for both directions.

## 4. 5. sense closed user group (33)

### Request data

| Field name               | Datatype |
|--------------------------|----------|
| first entry in cug table | num16    |
| last entry in cug table  | num16    |

### Answer data

| Field name                  | Datatype |
|-----------------------------|----------|
| closed user group facility? | num8     |
| cug with outgoing access?   | num8     |
| cug with incoming access?   | num8     |
| preferential cug            | hex-df20 |
| 1 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 2 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 3 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 4 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 5 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |

|                             |          |
|-----------------------------|----------|
| 6 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 7 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 8 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 9 closed user group number  | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |
| 10 closed user group number | hex-df20 |
| internal cug number         | num32    |
| outgoing calls barred?      | num8     |
| incoming calls barred?      | num8     |
| entry used?                 | num8     |

## Function

This operation allows you to get information associated to the CUG-memberships of this interface.

The operation can be used with bytecount 0,2 or 4 meaning :

- 0 : get information from all CUG-memberships defined for this interface.
- 2 : get information for the specified CUG-entry.
- 4 : get information for the specified interval of CUG-entries.

## Parameters

### first entry in cug table

Min-max: 0-255 Std: 1

### last entry in cug table

Min-max: 0-255 Std: 10

### closed user group facility?

If yes (1) then ordinary CUG-membership is specified ( no incoming or outgoing access) globally for this interface.

### cug with outgoing access?

If yes (1) then this interface has outgoing access globally defined to all its CUG-

memberships.

**cug with incoming access?**

If yes (1) then this interface has incoming access globally defined to all its CUG-memberships.

**preferential cug**

The local CUG-number defined as preferential for this interface.

#### 4. 6. get default destination addr (37)

**Request data**

None.

**Answer data**

| <u>Field name</u>           | <u>Datatype</u> |
|-----------------------------|-----------------|
| default destination address | text-fix        |

**Function**

This operation allows you to get the default destination address that is presently defined - if any. The default destination address is a non-X.25 facility allowing you to specify a default destination address to be used when a call-req packet is handled that contains no destination address (lgt of adr =0).

#### 4. 7. get current tariff (41)

**Request data**

None.

**Answer data**

| <u>Field name</u> | <u>Datatype</u> |
|-------------------|-----------------|
| current tariff    | num8            |

**Function**

This operation gets the tariff currently active.

#### 4. 8. sense HDLC state (45)

**Request data**

None.

**Answer data**

| <u>Field name</u>          | <u>Datatype</u> |
|----------------------------|-----------------|
| HDLC state (cd,cg,dg,dd,p) | num8            |

|                           |      |
|---------------------------|------|
| Data Set Ready (DSR)      | num8 |
| Data Carrier Detect (DCD) | num8 |
| Signal Quality (SQD)      | num8 |
| Calling Indicator (CI)    | num8 |

### Function

This operation gets the present state of the link as known by the HDLC - and the current status of the following incoming modem signals:

- DSR (data set ready)
- DCD (data carrier detect)
- SQD (signal quality detect)
- CI (calling indicator)

The value of the HDLC-state field can only be considered valid for COM205/HDLC3 systems.

A further dercription of the HDLC-state values can be found in the field-description.

Use of non-standard status bits in answer:  
Illegal state +11: HDLC was never opened.

### Parameters

#### HDLC state (cd, cg, dg, dd, p)

The values of this field means :

- 0 : connected ;     1 : connecting
- 2 : disconnecting ;   3 : disconnected
- 4 : passive;
- (\* line-states \*)

## 4. 9. Get DCE buf-configuration (49)

### Request data

None.

### Answer data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| Min no of rec-bufs at LIC    | num16           |
| Pref. no of rec-bufs at LIC  | num16           |
| No of headers in LIC         | num16           |
| Wait local indic bufs to LIC | num16           |
| Max net credit               | num16           |
| No of HDLC event buffers     | num16           |
| Input-buffers at HDLC        | num16           |
| Buffers at poolhandler       | num16           |
| Max no of bufs DCE can use   | num16           |
| No of buffers in LIC         | num16           |
| Buffer size / Max pac in buf | num16           |
| DTE version (1: 80, 0: 84)   | num8            |
| rec N1 (bits)                | num16           |
| receive buffers              | num16           |
| transmit buffers             | num16           |
| rec test elem pr buf         | num16           |
| xmit test elem pr buf        | num16           |

|                        |       |
|------------------------|-------|
| cntrl test elem pr buf | num16 |
| test bufs              | num16 |
| protocol               | bit8  |
| xmit N1 (bits)         | num16 |
| T3                     | num16 |

### Function

This operation gets the present buffer-configuration of the DCE.

The values retrieved are the same that can be set using the operation 'set DCE buf-configuration' (DCE,156,r).

### Parameters

#### Buffer size / Max pac in buf

The size of the buffers used in communication with LIC and Router.

The value must be set to: max packet size + 3 +46 or to the code for the maximum packet size the buffer shall contain: 8..12

#### DTE version (1: 80, 0: 84)

If the DTE is running X25 1980 the DCE may protect the DTE from input only allowed in 1984 version.

#### rec N1 (bits)

N1 as defined in x.25/2  
for received data

#### xmit N1 (bits)

N1 as defined in X.25/2  
for transmitted data

## 4. 10. Get huntgroup description (53)

### Request data

None.

### Answer data

| <u>Field name</u>          | <u>Datatype</u> |
|----------------------------|-----------------|
| Number of members in group | num8            |
| Lgt of 1. adress           | num8            |
| 1. hunt adress             | hex-df20        |
| Lgt of 2. adress           | num8            |
| 2. hunt adress             | hex-df20        |
| Lgt of 3.adress            | num8            |
| 3. hunt adress             | hex-df20        |
| Lgt of 4. adress           | num8            |
| 4. hunt adress             | hex-df20        |
| Lgt of 5. adress           | num8            |
| 5. hunt adress             | hex-df20        |

|                  |          |
|------------------|----------|
| Lgt of 6. adress | num8     |
| 6. hunt adress   | hex-df20 |
| Lgt of 7. adress | num8     |
| 7. hunt-adress   | hex-df20 |
| Lgt of 8. adress | num8     |
| 8. hunt-adress   | hex-df20 |

**Function**

This operation gets the huntgroup-members (X.121-adresses) for the huntgroup defined for this interface - if any.

**4. 11. Get redirection description (57)****Request data**

None.

**Answer data**

| <u>Field name</u>         | <u>Datatype</u> |
|---------------------------|-----------------|
| Length of redirect-adress | num8            |
| Redirect-adress           | hex-df20        |

**Function**

This operation gets the X.121-address to which redirection is performed.

**4. 12. get local charging prevention (61)****Request data**

None.

**Answer data**

| <u>Field name</u>         | <u>Datatype</u> |
|---------------------------|-----------------|
| local charging prevention | num8            |

**Function**

The operation tests if the local charging prevention facility is activated.

**Parameters****local charging prevention**

Result is 0: local charging prevention not set  
1: local charging prevention set

#### 4. 13. sense ats zone (65)

##### Request data

None.

##### Answer data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| validate calling             | num8            |
| logical addressing           | num8            |
| ats environment version      | hex-df20        |
| ats library version          | hex-df20        |
| options,opt,soft,ureq,abort  | hex-df20        |
| number of ats query buffers  | num8            |
| ats server name              | text-fix        |
| pnuc                         | hex-df20        |
| address, net                 | num8            |
| address, region              | num8            |
| address, node                | num8            |
| address, extension           | num16           |
| dce address, length          | num8            |
| dce address                  | hex-df20        |
| ats user index               | num16           |
| number of updates            | num16           |
| number of update answers     | num16           |
| number of queries            | num16           |
| number of query answers      | num16           |
| calling dte address, length  | num8            |
| calling dte address          | hex-df20        |
| calling nsap, type, length   | hex-df20        |
| calling nsap                 | hex-df20        |
| calling nsap                 | hex-df20        |
| called dte address, length   | num8            |
| called dte address           | hex-df20        |
| called nsap, type, length    | hex-df20        |
| called nsap                  | hex-df20        |
| called nsap                  | hex-df20        |
| num. of candidates in answer | num16           |
| ats stream number            | num8            |
| ats query semaphore open     | num8            |

##### Function

No help text for this operation

##### Parameters

options,opt,soft,ureq,abort  
 ats\_optional, soft\_init, user\_req,  
 abort\_return

##### calling nsap

See help for previous field.

called nsap

See help for previous field.

#### 4. 14. sense buffers (69)

##### Request data

None.

##### Answer data

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| total pool bufs        | num16           |
| total max used         | num16           |
| total cur used and req | num16           |
| total input cur req    | num16           |
| hdlc input max used    | num16           |
| hdlc input cur max     | num16           |
| hdlc input cur used    | num16           |
| hdlc output cur used   | num16           |
| lic input pref         | num16           |
| lic input min          | num16           |
| lic input cur used     | num16           |
| lic input cur req      | num16           |
| lic output cur used    | num16           |
| lic local ind max      | num16           |
| lic local ind cur used | num16           |
| dce data sem           | num16           |
| dce data or flowc lost | num16           |
| dce not acked queue    | num16           |
| dce trace sem          | num16           |
| dce m bit ref          | num16           |
| dce m bit box          | num16           |

##### Function

No help text for this operation

##### Parameters

###### total pool bufs

This is the number of buffers provided by the dce to the poolhandler/manager

###### total max used

This is the maximum number of buffers the dce is allowed to request from the poolhandler/manager.

###### total cur used and req

This is the number of buffers the dce currently uses or has requested from the poolhandler/manager

**total input cur req**

This is the number of buffers the dce currently has requested from the poolhandler/manager (but not yet received) to be used as input buffers to the hdlc or the lic.

**hdlc input max used**

This is the maximum number of buffers the dce uses as input buffers to the hdlc.

**hdlc input cur max**

This is the current maximum number of buffers the dce uses as input buffers to the hdlc.

**hdlc input cur used**

This is the number of buffers currently used by the dce as input buffers to the hdlc.

**hdlc output cur used**

This is the number of buffers currently used by the dce as output buffers to the hdlc.

**lic input pref**

This is the preferred number of buffers the dce shall use as input buffers to the lic.

**lic input min**

This is the minimum number of buffers the dce shall use as input buffers to the lic.

**lic input cur used**

This is the number of buffers currently used by the dce as input buffers to the lic.

**lic input cur req**

This is the number of buffers currently requested by the dce from the poolhandler/manager (but not yet received) to be used as input buffer to the lic.

**lic output cur used**

This is the number of buffers currently used by the dce as output buffers to the lic.

**lic local ind max**

This is the maximum number of buffers the dce shall use as wait local indication buffers to the lic.

**lic local ind cur used**

This is the number of buffers currently used by the dce as wait local indication buffers to the lic.

**dce data sem**

This is the number of buffers currently queued in the dce (on data\_sem) waiting to be sent to dte.

**dce data or flowc lost**

This is the number of buffers currently kept in the dce (on data\_or\_flowc\_ref) in connection with reset of the hdlc line

**dce not acked queue**

This is the number of buffers currently queued in the dce (on not\_acked\_queue) waiting for possible retransmission to the dte.

**dce trace sem**

This is the number of buffers currently kept in the dce on the trace\_sem.

**dce m bit ref**

This is the number of buffers currently kept by the dce on the m\_bit\_ref.

**dce m bit box**

This is the number of buffers currently kept by the dce on the m\_bit\_box.

## 4. 15. sense logical channel (113)

### Request data

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |

### Answer data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| entry number in lc_table      | num16           |
| logical channel number        | num16           |
| channel type (VC, PVC, DG)    | num8            |
| channel state                 | num8            |
| DTE in receive ready state    | bit8            |
| outstanding DTE interrupt     | bit8            |
| outstanding DCE interrupt     | bit8            |
| initial credit is sent        | bit8            |
| lower window edge for sending | num8            |
| lower window edge for receive | num8            |

|                             |          |
|-----------------------------|----------|
| next P(s) to send           | num8     |
| last received P(s)          | num8     |
| actual network credit       | num16    |
| DTE has outstanding d_bit   | bit8     |
| DCE has outstanding d_bit   | bit8     |
| DTE d_bit P(s)              | num8     |
| DCE d_bit P(s)              | num8     |
| next send P(s) to network   | num8     |
| last rec. P(r) from network | num8     |
| default credit              | num8     |
| priority                    | num8     |
| last used error cause       | num8     |
| last used diagnostic        | num8     |
| internal timeout counter    | num16    |
| remote net number           | num8     |
| remote region number        | num8     |
| remote node number          | num8     |
| remote extension number     | num16    |
| LIC incarnation number      | num8     |
| Local LIC index             | num16    |
| packets waiting to be sent  | num8     |
| waiting cause(6*?,nui,dnic) | bit8     |
| create date                 | hex-df20 |
| create time                 | hex-df20 |
| last update time, date      | hex-df20 |
| last update time, time      | hex-df20 |
| last update time, secs      | hex-df20 |
| #datapackets DTE ->network  | num32    |
| #datapackets network ->DTE  | num32    |
| #interrupts DTE ->network   | num32    |
| #interrupts network ->DTE   | num32    |
| Account record type         | bit16    |
| ACR sequence number         | num8     |
| calling x121 address length | num8     |
| calling x121 address, dnic  | hex-df20 |
| calling x121 address, ntn   | hex-df20 |
| called x121 address length  | num8     |
| called x121 address, dnic   | hex-df20 |
| called x121 address, ntn    | hex-df20 |
| packet size to DTE (2**x)   | num8     |
| packet size from DTE (2**x) | num8     |
| window size to DTE          | num8     |
| window size from DTE        | num8     |
| Throughput class to DTE     | num8     |
| Throughput class from DTE   | num8     |
| fast select parameter field | num8     |
| network user identifier     | text-fix |
| tariff 1, time in seconds   | num32    |
| transmitted segm.           | num32    |
| received segm.              | num32    |
| tariff 2, time in seconds   | num32    |
| transmitted segm.           | num32    |
| received segm.              | num32    |
| tariff 3, time in seconds   | num32    |
| transmitted segm.           | num32    |
| received segm.              | num32    |
| tariff 4, time in seconds   | num32    |
| transmitted segm.           | num32    |
| received segm.              | num32    |
| Hunting                     | num8     |

|                               |          |
|-------------------------------|----------|
| Redirecting                   | num8     |
| Transit delay requested       | num8     |
| Transit delay value           | num16    |
| Remote DTE version            | num8     |
| D-bit modification * a-part   | num8     |
| Remote credit                 | num8     |
| Accumulation limit            | num8     |
| Charge information requested  | num8     |
| Number of timeouts            | num8     |
| X25 next P(s) send to netw.   | num8     |
| X25 last P(r) rec. from netw. | num8     |
| Max un_ acknowledged packets  | num8     |
| redundant lic                 | num8     |
| pvc.byte1-7                   | hex-df20 |
| pvc.channel                   | num16    |
| pvc.window to dte             | num8     |
| pvc.window from dte           | num8     |
| pvc.remote charge             | num8     |
| pvc.destination net number    | num8     |
| pvc.destination region number | num8     |
| pvc.destination node number   | num8     |
| pvc.destination extension no. | num16    |
| pvc.hdlc priority             | num8     |
| pvc.lic incarnation           | num8     |
| pvc.lic index                 | num16    |
| Free queue                    | num16    |
| last account sent             | num8     |
| 80/84 sel. found in call req. | num8     |
| Data or flowc lost            | num8     |
| M-bit concatenation in use    | num8     |

## Function

This operation requests all information concerning a specified logical channel.

Use of non-standard status bits in answer:  
15: Logical channel zero.

## Parameters

**logical channel number**

Min-max: 1-4095 Std: 1

**entry number in lc\_table**

Index in the LC-table internal to the DCE.

**channel type (VC, PVC, DG)**

0 : VC  
1 : PVC  
2 : DG

**channel state**

The values of this field is explained  
in the text associated with the operation

(DCE,9,a)

**DTE in receive ready state**

- 1 : in receive ready state
- 0 : not in receive ready state

**outstanding DTE interrupt**

- 1 : DTE has sent an interrupt to DCE that has not yet been confirmed.
- 0 : no outstanding interrupt

**outstanding DCE interrupt**

- 1 : DCE has forwarded an interrupt-packet from the network to the DTE, but an interrupt-confirm packet has not yet been received from the DTE.
- 0 : No outstanding interrupt-packet.

**initial credit is sent**

- Indicates wheter the initial credit has been given to the remote LIC.
- 1 : yes
- 0 : no

**lower window edge for receive**

- Last acknowledged P(s).

**actual network credit**

- Actual credit (allowed number of buffers to send) towards the remote LIC.

**DTE has outstanding d\_bit**

- 1 : A datapacket with D-bit set has been delivered by the DTE to the network and has not yet been confirmed by the remote end.

**DCE has outstanding d\_bit**

- 1 : DCE has sent a datapacket with D-bit set to the DTE - and the DTE has not yet confirmed the packet.

**DTE d\_bit P(s)**

- The P(s) value of the last received datapacket with D-bit set from the DTE.

**DCE d\_bit P(s)**

- The P(s) value of the last transmitted datapacket with D-bit to the DTE.

**next send P(s) to network**

The P(s) value of the next datapacket that is transmitted to the network.

**last rec. P(r) from network**

The P(r) value of the last received datapacket from the network.

**default credit**

The start credit towards the network.  
(the number of packets the DCE is allowed to send to the remote LIC before an acknowledgment is required)

**priority**

HDLC-priority.

**last used error cause**

Error cause value is internal to the DCE.  
It is not an X.25 error cause value.  
The internal cause-values are explained in the text associated with this operation,  
(DCE,113,a).

**last used diagnostic**

Standardized values for diagnostic are used.  
Network dependant diagnostic:  
128 : NMC originated

**internal timeout counter**

The number of timer interrupts to receive before a timeout occurs. The timer interrupt interval (ticks) can be read by the 'get timeout values' operation (DCE,17,r).

**LIC incarnation number**

Incarnation number of the LIC port.

**Local LIC index**

The index at the local LIC giving the LIC-descriptor associated to this logical channel.

**packets waiting to be sent**

Used internally to indicate if datapackets are waiting to be forwarded to the DTE. (window towards the DTE is not open)

1 : yes packets waiting

0 : no packets waiting

**waiting cause(6\*,nui,dnic)**

The DCE is waiting for a specific event on this channel. Wait-causes are :

0 : not waiting      1 : SCC-DNIC response  
2 : SCC-NUI response   16: wait for buffer to  
measure delay   32: wait for echo of delaypckt.

**create date**

The date of establishing this virtual connection. The format is (yymmdd).

**create time**

The time (hour,minute,second) for establishment of this virtual connection.

**last update time, date**

The format for this field (bit15..bit0) is :

year\_after\_1900 : bit15..bit9  
month            : bit8..bit5  
day              : bit4..bit0

**last update time, time**

The format for this field (bit15..bit0) is:

compiler\_version : bit15..bit11  
hour             : bit10..bit6  
minute           : bit5..bit0

**last update time, secs**

The format for this field (bit15..bit0) is :

seconds         : bit15..bit10  
mseconds        : bit9..bit0

**#datapackets DTE ->network**

Number of datapackets from DTE to network

**#datapackets network ->DTE**

Number of datapackets from network to the DTE.

**#interrupts DTE ->network**

Number of interrupts sent from the DTE to the network.

**#interrupts network ->DTE**

Number of interrupts from the network to the DTE.

**Account record type**

The format being (bit15..bit0) typical bits are  
bit14 : 0 =A-account    1 =B-account

bit15 : 0 =X.25 or X.28 1 =X.75  
bit10,bit9 : 00 =X.25 or X.75, 10 =X.28 dial-up  
11 =X.28 permanent

**packet size to DTE (2\*\*x)**

Some typical values are :

|          |           |
|----------|-----------|
| 4 : 16 B | 7 : 128 B |
| 5 : 32 B | 8 : 256 B |
| 6 : 64 B |           |

**packet size from DTE (2\*\*x)**

Some typical values are :

|          |           |
|----------|-----------|
| 4 : 16 B | 7 : 128 B |
| 5 : 32 B | 8 : 256 B |
| 6 : 64 B |           |

**window size to DTE**

Default window size is 2

**window size from DTE**

Default window size is 2

**Throughput class to DTE**

4 : 110 bps, 5 : 300 bps, 6 : 600 bps,  
7 : 1200 bps, 8 : 2400 bps, 9 : 4800 bps,  
10 : 9.6 Kbps, 11 : 19.2 Kbps, 12 : 48 Kbps,  
13 : 64 Kbps.  
Other values : line-speed measure not succesful

**Throughput class from DTE**

4 : 110 bps, 5 : 300 bps, 6 : 600 bps,  
7 : 1200 bps, 8 : 2400 bps, 9 : 4800 bps,  
10 : 9.6 Kbps, 11 : 19.2 Kbps, 12 : 48 Kbps,  
13 : 64 Kbps.  
Other values : line-speed measure not succesful

**fast select parameter field**

For this field (bit8..bit1) typical values are:

bit1: 0 =reverse charge not requested  
1 =reverse charge requested  
bit8,bit7: 00,01 fast select (FS) not requested  
10 FS req no restrict 11 FS req restrict

**network user identifier**

The TA-part of the NUI.

**Hunting**

This logical channel is engaged in hunting  
(establishing a virtual connection to one of  
the members in a huntgroup)

1 : means hunting  
0 : not hunting

**Redirecting**

This logical channel is engaged in performing a redirection (establishing a virtual connection to an alternative address)

1 : means redirecting  
0 : not redirecting

**Transit delay requested**

Boolean indicating that a certain transit delay has been requested through the transit delay selection facility.

**Transit delay value**

The transit delay requested.  
Presently the transit delay facility is implemented dummy.

**Remote DTE version**

This is the version of the remote DTE  
It is derived from the private facility of the Call Request packet. Enable by req=204.  
NOTE: That it is NOT compatible with earlier versions of the DCE. vers8084sel should be off.

**D-bit modification \* a-part**

Will change from 0 to 1 the value of bit 7 of the GFI in all Call Request and Call Accepted packets and the value of the D bit in all packets received from the DTE.  
This does only apply for national calls.

**Remote credit**

Number of credits given to the remote end.

**Accumulation limit**

Credits are accumulated up to this limit.

**X25 next P(s) send to netw.**

Only used in case of extended packet sequence numbering

**X25 last P(r) rec. from netw.**

Only used in case of extended packet sequence numbering

**Max un\_acked packets**

The maximum number of data packets received from the dte before they shall be acknowledged by the dce.

**Free queue**

Number of free buffers of this channel.

**4. 16. get lc survey from index (149)****Request data**

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| first index in channel table | num16           |
| last index in channel table  | num16           |

**Answer data**

| <u>Field name</u>                    | <u>Datatype</u> |
|--------------------------------------|-----------------|
| closed, HDLC state (cl, up, dis)     | hex-df20        |
| DCE state (r0, r1, r2, r3_1, r3)     | num8            |
| HDLC line number                     | num8            |
| ....., crn, can                      | bit8            |
| rc, rca, fs, fsa, fcn, tcn, icb, ocb | bit8            |
| maximum throughput class             | num8            |
| active closed user groups            | num8            |
| own DNIC                             | hex-df20        |
| own Network Terminal Number          | hex-df20        |
| no. of active log. channels          | num16           |
| 1. logical channel number            | num16           |
| channel type (VC, PVC, DG)           | num8            |
| channel state                        | num8            |
| .....                                |                 |

**Function**

This operation is equivalent to (DCE,9,r) 'get DCE survey'.

The sole difference is that the parameters to this operation are the internal lc\_indices where logical channel numbers are used as parameters to (DCE,9,r).

**NOTE:**

For explanation of the single fields refer to the explanation for the equivalent field in (DCE,9,r).

**Parameters**

**first index in channel table**

Min-max: 1-4095 Std: 1

**last index in channel table**

Min-max: 1-4095 Std: 8

## 4. 17. Sense bcug (161)

### Request data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| First entry in the bcug_table | num16           |
| Last entry in the bcug_table  | num16           |

### Answer data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| Bcug subscription ?           | num8            |
| Bcug w.outg.access subscript. | num8            |
| 1 Local bcug number           | hex-df20        |
| Internal bcug number          | num32           |
| Addr lgt of the other membr   | num8            |
| X.121 addr of the other mem   | hex-df20        |
| Entry used ?                  | num8            |
| 2 Local bcug number           | hex-df20        |
| Internal bcug number          | num32           |
| Addr lgt of the other membr   | num8            |
| X.121 addr of the other mem   | hex-df20        |
| Entry used ?                  | num8            |
| 3 Local bcug number           | hex-df20        |
| Internal bcug number          | num32           |
| Addr lgt of the other membr   | num8            |
| X.121 addr of the other mem   | hex-df20        |
| Entry used ?                  | num8            |

### Function

No help text for this operation

### Parameters

**First entry in the bcug\_table**

Min-max: 1-100 Std: 1

**Last entry in the bcug\_table**

Min-max: 1-100 Std: 3

**1 Local bcug number**  
MIN =1, MAX =9999

**2 Local bcug number**  
MIN =1, MAX =9999

**3 Local bcug number**  
MIN =1, MAX =9999

#### 4. 18. Get 80/84 vars (D-bit - 8084) (205)

##### Request data

None.

##### Answer data

| <u>Field name</u>       | <u>Datatype</u> |
|-------------------------|-----------------|
| D-bit modification on   | num8            |
| Version 80/84 select on | num8            |
| Local DTE version 80/84 | num8            |
| M-bit facility on       | num8            |
| Retransmission on       | num8            |
| EPSN on                 | num8            |
| Dummy                   | num8            |

##### Function

Get the current value of the "D-bit modification" and "80/84 Selection" facility ON/OFF variables

##### Parameters

###### D-bit modification on

- 0 =D-bit modification procedure disabled
- 1 =D-bit modification procedure enabled

###### Version 80/84 select on

- 0 =version 80/84 selection disabled
  - 1 =version 80/84 selection enabled
- This facility should first be enabled when all DCE's is able to interchange their DTE version as a private facility. When OFF - as before.

###### Local DTE version 80/84

- 0 =version 84 local DTE
- 1 =version 80 local DTE
- 80 =version 80 local DTE
- 84 =version 84 local DTE

###### M-bit facility on

- 0 =M-bit facility disabled
  - 1 =M-bit facility enabled
- This facility should first be enabled when all DCE's is able to support the M-bit facility.

###### Retransmission on

- 0 =Retransmission disabled
- 1 =Retransmission enabled

**EPSN on**

0 =Extended Packet Sequence Numbering disabled

1 =Extended Packet Sequence Numbering enabled

**4. 19. sense poolhandler zone (209)****Request data**

None.

**Answer data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| env version, version          | num8            |
| env version, release          | num8            |
| lib version, version          | num8            |
| lib version, release          | num8            |
| options, soft-init            | num8            |
| options, % private            | num8            |
| options, export bufs          | num8            |
| buffer-size (bytes)           | num16           |
| poolhandler incarnation       | num8            |
| poolhandler main-mailbox      | text-fix        |
| common-pool mailbox           | text-fix        |
| own incarnation-name          | text-fix        |
| users poolhandler-zone stream | num8            |
| poolhandlers index            | num8            |
| no of buffers requested       | num16           |
| no of buffers allocated       | num16           |
| max buffers in use            | num16           |
| no of buffers in use          | num16           |
| max zone_headers allowed      | num16           |
| no of zone-headers allocated  | num16           |
| max zone-headers missing      | num16           |
| no of zone-headers missing    | num16           |
| user-wait, prio 0             | num16           |
| user-wait, prio 1             | num16           |
| user-wait, prio 2             | num16           |
| user-wait, prio 3             | num16           |
| max no of private             | num16           |
| private hits                  | num32           |
| common hits                   | num32           |
| handler hits                  | num32           |
| private returns               | num32           |
| common returns                | num32           |
| (spare)                       | num32           |

**Function**

No help text for this operation



## 5. Statistics Operations.

### 5. 1. get logical channel statistic (6)

#### Request data

| <u>Field name</u>     | <u>Datatype</u> |
|-----------------------|-----------------|
| lower logical channel | num16           |
| upper logical channel | num16           |

#### Answer data

| <u>Field name</u>         | <u>Datatype</u> |
|---------------------------|-----------------|
| active logical channels   | num16           |
| 1. logical channel number | num16           |
| transmitted data packets  | num32           |
| received data packets     | num32           |
| transmitted interrupts    | num32           |
| received interrupts       | num32           |
| .....                     |                 |

#### Function

This operation allows you to get statistical informations of the active logical channels.

The operation can be used with bytecount 0,2 or 4 meaning:

- 0 : all active logical channels
- 2 : one specified logical channel
- 4 : an interval of logical channels

#### Parameters

**lower logical channel**

Min-max: 1-4095 Std: 1

**upper logical channel**

Min-max: 1-4095 Std: 4095

**transmitted data packets**

Number of transmitted data packets from DTE to the network.

**received data packets**

Number of data packets forwarded from the network to the DTE.

**transmitted interrupts**

Number of interrupt packets sent from DTE to the network.

**received interrupts**

Number of interrupt packets forwarded from the network to the DTE.

**5. 2. get HDLC line statistics (14)****Request data**

None.

**Answer data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| number of received infos      | num32           |
| number of transmitted infos   | num32           |
| number of skipped packets     | num32           |
| number of retransmitted infos | num32           |
| number of received RNR        | num16           |
| number of transmitted RNR     | num16           |
| number of received REJ        | num16           |
| number of transmitted REJ     | num16           |
| no. of timeout retrans.       | num16           |
| no. of detected CTS off       | num16           |
| no. of detected DSR off       | num16           |
| no. of detected DCD off       | num16           |
| no. of detected CI on         | num16           |
| no. of detected SQD off       | num16           |
| rej fc field                  | num8            |
| VR,response,VS,na1            | bit8            |
| na2,na3,na4,na5,Z,Y,X,W       | bit8            |
| no. of receiver overrun       | num16           |
| no. of transmitter underrun   | num16           |
| no. of receiver abort         | num16           |
| no. of receive errors         | num16           |
| no. of rec. empty l frames    | num16           |
| future use 2                  | num16           |
| future use 3                  | num8            |
| com id                        | num8            |
| received SABM                 | num16           |
| transmitted SABM              | num16           |
| received bytes                | num32           |
| transmitted bytes             | num32           |
| received databytes            | num32           |
| transmitted databytes         | num32           |

**Function**

This operation reads statistical information in the HDLC connected to this DCE.

The format of the answer is for COM204, the COM205 answer contains some extra fields - they are suppressed by necessity.  
A hard-wait is performed to get the information.

Use of non-standard status bits in answer:  
Illegal\_state +11: HDLC was never opened.

### 5. 3. Get buffer statistics (18)

#### Request data

None.

#### Answer data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| No of HDLC event_lost         | num32           |
| No of HDLC events with u2 <ok | num32           |
| No of HDLC output ok          | num32           |
| No of HDLC output not ok      | num32           |
| No of HDLC input ok           | num32           |
| No of HDLC input not ok       | num32           |

#### Function

The operation collects buffer statistics with the HDLC.

The actual statistical information is found in the answer record of this operation.



## 6. Old Event Ordering Operations.

### 6. 1. set event bit mask (4)

#### Request data

| <u>Field name</u>  | <u>Datatype</u> |
|--------------------|-----------------|
| bits to be updated | bit16           |
| new values         | bit16           |

#### Answer data

| <u>Field name</u> | <u>Datatype</u> |
|-------------------|-----------------|
| updated mask      | bit16           |

#### Function

Bit 1 is the most significant bit.

- bit1 : Measure-delay event (55).
- bit2 : HDLC-connected event (39).
- bit3 : HDLC-disc and warning events (43,51)
- bit4 : SCC-rsp event (47).
- bit5 : A-account event generation (163).
- bit6 : B-account event generation (167).
- bit7 : Diagnostic packet event (199).
- bit8 : ATS response event(59)
- bit9 : DCE reset,reset\_req,reset\_conf events(231,223,215)
- bit10: call-req,call-acc events(207,23)
- bit11: DCE-clear,clear\_req,clear\_conf events(227,211,27)
- bit12: Restart\_req,restart\_conf,restart\_indication events (203,219,235).
- bit13: LIC establish event(31)

All other bits are not used.

#### Parameters

**bits to be updated**

Std: 11111111 11111111

**new values**

Std: 01100000 00000010

## 6. 2. get event bit mask (5)

### Request data

None.

### Answer data

| <u>Field name</u>     | <u>Datatype</u> |
|-----------------------|-----------------|
| actual event bit mask | bit16           |

### Function

This operation fetches the present value of the eventmask.  
For an explanation of the single bits refer to operation  
4 (set event bit mask).

## 7. Supervisory Events.

### 7. 1. HDLC line up (39)

#### Event data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| HDLC event (0: up, 2: reset) | num8            |
| HDLC line number             | num8            |

#### Function

This event is generated when the HDLC driver returns a 'line up' event.

### 7. 2. HDLC line down (43)

#### Event data

| <u>Field name</u> | <u>Datatype</u> |
|-------------------|-----------------|
| HDLC event data   | num8            |
| HDLC line number  | num8            |

#### Function

This event is generated when the HDLC driver returns a 'line down' event. (See manual for detailed description).

Some typical events are :

- 2 : reset line; SABM received in connected state - UA sent
- 4 : disconnected by other end. The link is disconnected.
- 5 : unsolicited UA received - error recovery initiated.
- 6 : FRMR received error - recovery initiated.
- 7 : Frame with unintelligible control field received - FRMR sent.
- 8 : unsolicited response with F-bit received - recovery initiated.
- 9 : I-frame with illegal size (#bits > n1) received. FRMR sent.
- 10: I- or S-frame with ill. seq. no received - FRMR sent.
- 11: Timeout - SABM is sent and reestablishment is tried.
- 12: Timeout - driver gives up. 13: Temp rec. malfunction

## Parameters

### HDLC event data

Most events are shortly described in the explanation field of this event.  
For a detailed description refer to the manual.

## 7. 3. HDLC line warning (51)

### Event data

| <u>Field name</u> | <u>Datatype</u> |
|-------------------|-----------------|
| HDLC event data   | num8            |
| HDLC line number  | num8            |

### Function

This event is generated when a HDLC-event categorized as a warning is received from the HDLC-driver.

The following events are considered warnings :

- 1 : RNR-timeout ; t1 has run out n2 times. Error-recovery is initiated if rnr-disc is true (set in open-HDLC).
- 13 : Temporary line error
  - a) Modem clock on transmitter is lost for more than timer t1. Will be repeated when t1 \*n2 sec has elapsed.
  - b) n2 frames received with CRC-error or overrun or n2 frames transmitted with underrun.
- 15 : Parity error in controller RAM. Line state is unchanged.

## Parameters

### HDLC event data

Most events are shortly described in the explanation field of this event.  
For a detailed description refer to the manual.

## 8. Transmission Events.

### 8. 1. call accepted from DTE (23)

#### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| q_bit,d_bit,m_128,m_8,lcgn(4) | bit8            |
| logical channel number        | num8            |
| DTE address lengths           | hex-df20        |
| 4. byte                       | hex-df20        |
| .....                         | hex-df20        |

#### Function

This event is generated when an incoming call is accepted by the DTE.

#### Parameters

q\_bit,d\_bit,m\_128,m\_8,lcgn(4)  
The GFI (general format identifier) followed by the logical channel group number.

### 8. 2. clear confirmation from DTE (27)

#### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| logical channel number        | num16           |
| received packets from DTE     | num32           |
| transmitted packets to DTE    | num32           |
| received interrupts from DTE  | num32           |
| transmitted interrupts to DTE | num32           |

#### Function

This event is generated when a DTE clear confirmation is received from the DTE.

### 8. 3. indication establish lic (31)

#### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| q_bit,d_bit,m_128,m_8,lcgn(4) | bit8            |
| logical channel               | num8            |
| DTE address lengths           | hex-df20        |
| 4. byte                       | hex-df20        |
| .....                         | hex-df20        |

#### Function

This event is generated whenever a LIC establishment-indication has been received.

#### Parameters

q\_bit,d\_bit,m\_128,m\_8,lcgn(4)  
The GFI (general format identifier) followed by the logical channel group number.

### 8. 4. SCC indication answer (47)

#### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| request sequence number       | num8            |
| SCC result (0:ok,1:war,3:fai) | num8            |
| SCC reason (see manual)       | num16           |

#### Function

No help text for this operation

#### Parameters

**SCC result (0:ok,1:war,3:fai)**  
If 'warning' or 'failure' then the next field contains the reason.

**SCC reason (see manual)**  
CS-reason definitions (from CS-env in SL-man.)  
0 : no reason      40 : busy - no resources  
1 : remote user disc.   41 : addr unknown  
2 : system init. disconnect  
3 : insufficient QOS caused disconnect

## 8. 5. measured transit delay (55)

### Event data

| <u>Field name</u>        | <u>Datatype</u> |
|--------------------------|-----------------|
| sequence number          | num8            |
| logical channel number   | num16           |
| packet length            | num16           |
| transit delay * 2, hours | num8            |
| minutes                  | num8            |
| seconds                  | num8            |
| millisecs                | num16           |

### Function

This event is generated to give the result of a transit-delay measurement.

NOTE : the measured delay is the net-delay for one packet sent forth and back.

## 8. 6. address translation respond (59)

### Event data

| <u>Field name</u>            | <u>Datatype</u> |
|------------------------------|-----------------|
| calling dte addr, length     | num8            |
| calling dte addr             | hex-df20        |
| calling general, addr. kind  | bit8            |
| calling general, type/length | num8            |
| calling general, address     | hex-df20        |
| calling general, address     | hex-df20        |
| called dte addr, length      | num8            |
| called dte addr              | hex-df20        |
| called general, addr. kind   | bit8            |
| called general, type/length  | num8            |
| called general, address      | hex-df20        |
| called general, address      | hex-df20        |
| access point, net            | num8            |
| access point, region         | num8            |
| access point, node           | num8            |
| access point, extension      | num16           |
| ats answer result            | num8            |
| ats answer reason            | num16           |

### Function

No help text for this operation

### Parameters

**calling dte addr, length**  
length of the calling address as a dte address

**calling dte addr**  
the value of the calling dte address field

**calling general, addr. kind**

address kind of the calling general address  
field: possible values ak\_null, ak\_dte, ak\_nsap

**calling general, type/length**

depending of the address kind, this field is  
either an encoded type/length field (the two most significant bytes indicates the type) or  
only a length field (if kind =ak\_dte)

**calling general, address**

this field contains the address element as  
specified in the addr. kind field

**calling general, address**

See help for previous field.

**called dte addr, length**

length of the called address as a dte address

**called dte addr**

the value of the called dte address field

**called general, addr. kind**

address kind of the called general address  
field: possible values ak\_null, ak\_dte, ak\_nsap

**called general, type/length**

depending of the address kind, this field is  
either an encoded type/length field (the two most significant bytes indicates the type) or  
only a length field (if kind =ak\_dte)

**called general, address**

this field contains the address element as  
specified in the addr. kind field

**called general, address**

See help for previous field.

**access point, net**

net field of the datagram address of the access  
point to the destination address

**access point, region**

region field of the datagram address of the  
access point to the destination address

**access point, node**

node field of the datagram address of the  
access point to the destination address

**access point, extension**

extension field of the datagram address of the  
access point to the destination address

**8. 7. incoming call to DTE (63)****Event data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| q_bit,d_bit,m_128,m_8,lcgn(4) | bit8            |
| logical channel number        | num8            |
| DTE address lengths           | hex-df20        |
| 4. byte                       | hex-df20        |
| .....                         | hex-df20        |

**Function**

No help text for this operation

**8. 8. call connected to DTE (67)****Event data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| q_bit,d_bit,m_128,m_8,lcgn(4) | bit8            |
| logical channel number        | num8            |
| DTE address lengths           | hex-df20        |
| 4. byte                       | hex-df20        |
| .....                         | hex-df20        |

**Function**

No help text for this operation

**Parameters**

q\_bit,d\_bit,m\_128,m\_8,lcgn(4)  
The GFI (general format identifier) followed  
by the logical channel group number.

**8. 9. establish lic request (71)****Event data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| q_bit,d_bit,m_128,m_8,lcgn(4) | bit8            |
| logical channel               | num8            |
| DTE address lengths           | hex-df20        |

|         |          |
|---------|----------|
| 4. byte | hex-df20 |
| .....   | hex-df20 |

**Function**

No help text for this operation

**Parameters**

**q\_bit,d\_bit,m\_128,m\_8,lcgn(4)**  
 The GFI (general format identifier) followed  
 by the logical channel group number.

**8. 10. PVC\_removal\_xcep (159)****Event data**

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| logical channel number        | num16           |
| clear cause (internal value)  | num8            |
| clear diagnostic              | num8            |
| call set up time              | hex-df20        |
| received packets from DTE     | num32           |
| transmitted packets to DTE    | num32           |
| received interrupts from DTE  | num32           |
| transmitted interrupts to DTE | num32           |
| lic status (0: ok)            | num8            |

**Function**

This event is generated whenever a LIC remove-indication is received on a channel that is used for a PVC.

The event cannot presently be controlled by the event-mask  
 - it is considered as important as the exception event.

**Parameters**

**clear cause (internal value)**  
 For further explanation of the internal cause  
 value refer to exp (113,a)

**clear diagnostic**  
 This is the diagnostic code sent to the DTE in  
 the clear-indication packet.  
 Coding follows rec. X.25.

**8. 11. A-end Account record (163)****Event data**

| <u>Field name</u>   | <u>Datatype</u> |
|---------------------|-----------------|
| Account record type | bit16           |

|                              |          |
|------------------------------|----------|
| local address, net           | num8     |
| region                       | num8     |
| node                         | num8     |
| extension                    | num16    |
| network user identifier      | text-fix |
| logical channel number       | num16    |
| channel type(0:svc, 1:pvc)   | num8     |
| account sequence number      | num8     |
| cause(cl,tmo,req,res,?,?,?)  | bit8     |
| clear cause (expl 113,a).    | num8     |
| diagnostic (cf. x25 recom.)  | num8     |
| remote address, net          | num8     |
| region                       | num8     |
| node                         | num8     |
| extension                    | num16    |
| calling address, length      | num8     |
| calling address, x121 format | hex-df20 |
| called address, length       | num8     |
| called address, x121 format  | hex-df20 |
| user facilities, length      | num8     |
| throughput class =2          | num8     |
| Throughp. class(to,fr DTE)   | hex-df20 |
| window =67                   | num8     |
| window, to dte               | num8     |
| window, from dte             | num8     |
| packet size =66              | num8     |
| packet size, to DTE          | num8     |
| packet size, from DTE        | num8     |
| fast select =1               | num8     |
| fs,rst,?,?,?,?,?,rc          | bit8     |
| not used                     | text-fix |
| call setup time              | hex-df20 |
| tariff 1, time in seconds    | num32    |
| transmitted segm.            | num32    |
| received segm.               | num32    |
| tariff 2, time in seconds    | num32    |
| transmitted segm.            | num32    |
| received segm.               | num32    |
| tariff 3, time in seconds    | num32    |
| transmitted segm.            | num32    |
| received segm.               | num32    |
| tariff 4, time in seconds    | num32    |
| transmitted segm.            | num32    |
| received segm.               | num32    |

## Function

When generated this event contains information that:

- identifies a specific virtual connection
- identifies facilities used
- identifies the number of segments (64B) sent and received within each tariff-period.
- identifies the duration of the connection.

## Parameters

### Account record type

The format being (bit15..bit0) typical bits are  
bit14 : 0 =A-account    1 =B-account

bit15 : 0 =X.25 or X.28 1 =X.75  
bit10,bit9 : 00 =X.25 or X.75, 10 =X.28 dial-up  
11 =X.28 permanent

**network user identifier**

The TA-part of the used NUI if any.

**cause(cl,tmo,req,res,?,?,?)**

cl:cleared, tmo:timeout, req:nmc request,  
res:informations are reset.

**clear cause (expl 113,a).**

The internal clear cause - does not in all  
cases directly correspond to X.25 causes.

**throughput class =2**

Identification of throughput class facility.

**Throughp. class(to,fr DTE)**

4 : 110 bps, 5 : 300 bps, 6 : 600 bps,  
7 : 1200 bps, 8 : 2400 bps, 9 : 4800 bps,  
A : 9.6 Kbps, B : 19.2 Kbps, C : 48 Kbps,  
D : 64 Kbps.  
Other values : line-speed measure not succesful

**window =67**

Identification of facility for window-size.

**packet size =66**

Identification of facility for packet-size.

**packet size, to DTE**

The value of this field to the power of 2  
gives the user packet-size.

4 : 16B; 5 : 32B; 6 : 64B;  
7 : 128B; 8 : 256B;

**packet size, from DTE**

The value of this field to the power of 2  
gives the user packet-size.

4 : 16B; 5 : 32B; 6 : 64B;  
7 : 128B; 8 : 256B;

**fast select =1**

Identification of facility for fast select -  
reverse charge.

fs,rst,?,?,?,?,rc

fs: fast select,

rst: with restrictions

rc: reverse charging

## 8. 12. B-end Account record (167)

### Event data

| Field name                     | Datatype |
|--------------------------------|----------|
| Account record type            | bit16    |
| local address, net             | num8     |
| region                         | num8     |
| node                           | num8     |
| extension                      | num16    |
| network user identifier        | text-fix |
| logical channel number         | num16    |
| channel type(0:svc, 1:pvc)     | num8     |
| account sequence number        | num8     |
| cause(cl,tmo,req,res,?,?,?,?,) | bit8     |
| clear cause (expl 113,a).      | num8     |
| diagnostic (cf. x25 recom.)    | num8     |
| remote address, net            | num8     |
| region                         | num8     |
| node                           | num8     |
| extension                      | num16    |
| calling address, length        | num8     |
| calling address, x121 format   | hex-df20 |
| called address, length         | num8     |
| called address, x121 format    | hex-df20 |
| user facilities, length        | num8     |
| throughput class =2            | num8     |
| Throughp. class(to,fr DTE)     | hex-df20 |
| window =67                     | num8     |
| window, to dte                 | num8     |
| window, from dte               | num8     |
| packet size =66                | num8     |
| packet size, to DTE            | num8     |
| packet size, from DTE          | num8     |
| fast select =1                 | num8     |
| fs,rst,?,?,?,?,rc              | bit8     |
| not used                       | text-fix |
| call setup time                | hex-df20 |
| tariff 1, time in seconds      | num32    |
| transmitted segm.              | num32    |
| received segm.                 | num32    |
| tariff 2, time in seconds      | num32    |
| transmitted segm.              | num32    |
| received segm.                 | num32    |
| tariff 3, time in seconds      | num32    |
| transmitted segm.              | num32    |
| received segm.                 | num32    |
| tariff 4, time in seconds      | num32    |
| transmitted segm.              | num32    |
| received segm.                 | num32    |

## Function

When generated this event contains information that:

- identifies a specific virtual connection
- identifies facilities used
- identifies the number of segments (64B) sent and received within each tariff-period.
- identifies the duration of the connection.

## Parameters

### Account record type

The format being (bit15..bit0) typical bits are

bit14 : 0 =A-account 1 =B-account

bit15 : 0 =X.25 or X.28 1 =X.75

bit10,bit9 : 00=X.25 or X.75, 10=X.28 dial-up

11=X.28 permanent

### network user identifier

The TA-part of the used NUI if any.

### cause(cl,tmo,req,res,?,?,?)

cl:cleared, tmo:timeout, req:nmc request,

res:informations are reset.

### clear cause (expl 113,a).

The internal clear cause - does not in all cases directly correspond to X.25 causes.

### throughput class =2

Identification of throughput class facility.

### Throughp. class(to,fr DTE)

4 : 110 bps, 5 : 300 bps, 6 : 600 bps,

7 : 1200 bps, 8 : 2400 bps, 9 : 4800 bps,

A : 9.6 Kbps, B : 19.2 Kbps, C : 48 Kbps,

D : 64 Kbps.

Other values : line-speed measure not succesful

### window =67

Identification of facility for window-size.

### packet size =66

Identification of facility for packet-size.

### packet size, to DTE

The value of this field to the power of 2 gives the user packet-size.

4 : 16B; 5 : 32B; 6 : 64B;

7 : 128B; 8 : 256B;

**packet size, from DTE**

The value of this field to the power of 2 gives the user packet-size.

4 : 16B; 5 : 32B; 6 : 64B;

7 : 128B; 8 : 256B;

**fast select =1**

Identification of facility for fast select - reverse charge.

**fs,rst,?,?,?,rc**

fs: fast select,

rst: with restrictions

rc: reverse charging

## 8. 13. diagnostic packet (199)

### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| diagnostic code (see X.25)    | num8            |
| q_bit,d_bit,m_128,m_8,lcgn(4) | bit8            |
| logical channel number        | num8            |
| packet type identifier        | bit8            |

### Function

This event is generated whenever a diagnostic-packet is issued to the DTE.

## 8. 14. restart request from DTE (203)

### Event data

| <u>Field name</u>  | <u>Datatype</u> |
|--------------------|-----------------|
| HDLC line number   | num16           |
| restart cause      | num8            |
| restart diagnostic | num8            |

### Function

This event is generated when a restart-packet is received from the DTE.

### Parameters

**restart cause**

Cause value as read from packet. Typical values

0 : local procedure error

3 : network congestion

7 : network operational

## 8. 15. call request from DTE (207)

### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| q_bit,d_bit,m_128,m_8,lcgn(4) | bit8            |
| logical channel number        | num8            |
| DTE address lengths           | hex-df20        |
| 4. byte                       | hex-df20        |
| .....                         | hex-df20        |

### Function

This event is generated when the DCE receives a call-request packet from the DTE.

## 8. 16. clear request from DTE (211)

### Event data

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |
| clear cause            | num8            |
| clear diagnostic       | num8            |

### Function

This event is generated when a clear-request packet is received from the DTE.  
 Clear-cause values are found in X.25 - typical values are :  
 0, >127 : DTE originated  
 1 : number busy  
 3 : invalid facility request  
 5 : network congestion  
 9 : out of order  
 11: access barred  
 13: not obtainable  
 17: remote procedure error  
 19: local procedure error  
 25: reverse charge acceptance not subscribed  
 33: incompatible destination  
 41: fast select acceptance not subscribed

### Parameters

#### clear cause

The cause value as read from packet.  
 Further explanation is found in exp (211,e).

## 8. 17. reset confirmation from DTE (215)

### Event data

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |

### Function

This event is generated when a reset-confirmation is received from the DTE.

## 8. 18. restart confirmation from DTE (219)

### Event data

| <u>Field name</u>           | <u>Datatype</u> |
|-----------------------------|-----------------|
| logical channel number (=0) | num16           |

### Function

This event is generated when a restart-confirmation packet is received from the DTE.

## 8. 19. reset request from DTE (223)

### Event data

| <u>Field name</u>      | <u>Datatype</u> |
|------------------------|-----------------|
| logical channel number | num16           |
| reset cause            | num8            |
| reset diagnostic       | num8            |

### Function

This event is generated when a reset-request packet is received from the DTE.

Cause and diagnostic values can be found in X.25 - typical cause values are :

- 0, >127 : DTE originated
- 1 : out of order (PVC only)
- 3 : remote procedure error
- 5 : local procedure error
- 7 : network congestion
- 9 : remote DTE operational (PVC only)
- 15: network operational (PVC only)
- 17: incompatible destination
- 29: network out of order (PVC only)

### Parameters

#### reset cause

Cause as read in packet. For further explanation refer to exp (223,e)

## 8. 20. logical channel cleared (227)

### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| logical channel number        | num16           |
| clear cause (internal value)  | num8            |
| clear diagnostic              | num8            |
| call set up time              | hex-df20        |
| received packets from DTE     | num32           |
| transmitted packets to DTE    | num32           |
| received interrupts from DTE  | num32           |
| transmitted interrupts to DTE | num32           |
| lic status (0: ok)            | num8            |

### Function

No help text for this operation

### Parameters

#### **clear cause (internal value)**

For further explanation of the internal cause value refer to exp (113,a)

#### **clear diagnostic**

This is the diagnostic code sent to the DTE in the clear-indication packet.  
Coding follows rec. X.25.

## 8. 21. logical channel reset (231)

### Event data

| <u>Field name</u>             | <u>Datatype</u> |
|-------------------------------|-----------------|
| logical channel number        | num16           |
| reset cause (internal value)  | num8            |
| reset diagnostic              | num8            |
| call set up time              | hex-df20        |
| received packets from DTE     | num32           |
| transmitted packets to DTE    | num32           |
| received interrupts from DTE  | num32           |
| transmitted interrupts to DTE | num32           |
| lic status (0: ok)            | num8            |

### Function

This event is generated when the DCE initiates a resetting of a logical channel.

## Parameters

### **reset cause (internal value)**

For further explanation of the internal reset cause value refer to exp (113,a)

## 8. 22. restart indication (235)

### Event data

| <u>Field name</u>  | <u>Datatype</u> |
|--------------------|-----------------|
| HDLC line number   | num16           |
| restart cause      | num8            |
| restart diagnostic | num8            |

### Function

No help text for this operation

### Parameters

#### **restart cause**

Cause value as read from packet. Typical values

0 : local procedure error

3 : network congestion

7 : network operational

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