

Configuration of ADM-1 OSI Protocol

The 'OSI Setup' option is available in the Configuration menu and is used to send, to the ADM-1 Communication unit (if used) or MOST Unit, an ASCII configuration file with the parameters of OSI protocol stack, used for the communication with the Network Management Centre (both on the Ethernet and on the DCCs).

For what regards layers two to four the protocols are specified by the following recommendations.

On layer 2:

- ◆ On Ethernet : ISO 8802-3 (CSMA/CD)
 ISO 8802-2 (LLC)
- ◆ On DCC : CCITT Q.920/921 (LAPD)

On layer 3:

- ◆ ISO 8473 (CLNP)
- ◆ ISO 9542 (ESIS)
- ◆ ISO 10589 (ISIS)

On layer 4:

- ◆ ISO 8073 (OSI Transport)

The information contained in this document, and related to the second and third OSI layers, may be used for a first check of the interoperability at the DCN level between our SDH equipment and equipment by another manufacturer. Such interoperability may be desirable both on ethernet Q-interface (QB3) and on QECC.

Note that, with few exceptions (such as the System Id length which should be the same for two systems within the same ISIS domain, or the LAPD frame size which, together with its header and its footer, should be equal or smaller than the Maximum Data packet Size on the other side of the STM-1 connection), it is not necessary that the parameters are configured exactly in the same way. This capability allows interoperability between systems by different manufacturers. However, big discrepancies in the values of some parameters, such as the LAPD, ESIS and ISIS timers, may prevent the communication from working properly.

The information related to layer 4 profiling may be useful to try and improve the performance of the communication between a Network Element and its Element Manager.

Changing the OSI Protocol Parameters

To change the OSI protocol parameters on the ADM-1 it is necessary to prepare a file with a list of messages to be sent.

On each line of this file must be written a file name followed by a carriage return.

The messages are sent to the ADM-1 in the written order.

The messages are ASCII files.

Default templates for the messages are created during the software installation.

The first part of the message contains type information and cannot be modified, the remaining part contains the customisable configuration parameters.

Each parameter is explained by a brief comment, preceded by the character '#'.

Every value in the message is given in hexadecimal format and parameters length cannot be modified.

For parameters with length of two or more bytes, the first byte is the high order byte

(ex: dec. 256 on a parameter of two byte length -> 01 00,

dec. 2 on a parameter of four byte length -> 00 00 00 02).

Range and default values of each message parameter are shown in the following pages.

All the values are given in decimal format.

In the following a printout is given of all the OSI configuration template files with a short description of a number of parameters, related to the OSI layers 2, 3 and 4, that may be relevant for DCN communication, and their default values and allowed ranges on ADM-1.

Anyway, some parameters have to be entered by the Control Application even if the equipment doesn't implement OSI stack management. Such parameters are the following.

- ◆ For the whole equipment: NSAP address.
- ◆ For the ethernet circuit (if any) : ethernet MAC address.
- ◆ For each DCC circuit : LAPD side (User or Network)
DCC profile identifier

This is all the information needed by the OSI stack implementation in ADM-1 equipment to run the default configuration.

IMPORTANT Sending a file with wrong parameters can interrupt the communication with the Network Management centre.

Message:

Configuration of a DCC Profile

(template file: s dccp0)

Protocol stack layer #1/2/3 Configuration

```
#
# message: set configuration of dcc profiles
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 16
#
# dcc profile identifier (range: 0 to 4). def = 0
00 00 00 00
#
# n201 (lapd frame size) (range: 0 to 5e9). def = 5e9
00 00 05 e9
#
# k (lapd window size)
# (range: 0 to 7 if lapd modulo = 0; 0 to 7f if lapd modulo = 1). def = 7
00 00 00 07
#
# n200 (lapd retransmission count) (range: 0 to 400). def = 3
00 00 00 03
#
# lapd congestion timer (range: 1 to 400) in tenths of second.
# def = a (1 second)
00 00 00 0a
#
# t200 (lapd retransmit timer) (range: 1 to 400) in tenths of second.
# def = a (1 second)
00 00 00 0a
#
# t203 (lapd idle timer) (range: 1 to 400) in tenths of second.
# def = 96 (15 seconds)
00 00 00 96
#
# lapd modulo (0 = modulo 8 operation; 1 = modulo 128 operation).
# def = 1 (128)
00 00 00 01
#
# max layer 3 packet size supported (range: 1f4 to 5dc).
# def = 5d4 (1492 bytes)
00 00 05 d4
#
# isis hello timer (range: 1 to ffff) in seconds. def = 3
00 00 00 03
#
# level 1 default metric (range:1 to 3f). def = 14 (20)
00 00 00 14
#
# level 2 default metric (range:1 to 3f). def = 14 (20)
00 00 00 14
#
# external domain (1 = enabled; 0 = disabled). def = 0
00 00 00 00
#
# ISO 9542 options:
#     bit 0 = configuration
```

```
#      bit 1 = redirect
#      bit 2 = notification
#      bit 3 = checksum
#
#      def = configuration | redirect | notification = 7
07
#
# ISO 9542 is configuration timer (range: 1 to ffff) in seconds.
# def = 0a (10 seconds)
00 00 00 0a
#
# ISO 9542 es configuration timer (range: 1 to ffff) in seconds.
# def = 258 (600 seconds)
00 00 02 58
#
# ISO 9542 holding time multipl. (range: 1 to 3f). def = 3
00 00 00 03
#
# end of message
```

----- Each s_dccpx file corresponds to a different DCC profile (x=0 to 4)

dcc profile identifier

This is the identifier for the profile that can be 0 or 4 on DCC (a DCC profile is a set of values for the OSI stack parameters related to a DCC Interface).

n201

Maximum length of the information field allowed on LAPD, in bytes. This parameter acts as a limit on the size of messages which may be transmitted or received on LAPD. If a message exceeds the limit, it is discarded, both on transmission and on reception.

Range : [1-1513]

Default : 1513

k

Window size on LAPD.

Range : [0-7], if modulo 8, and [0-127] if modulo 128

Default : 7

n200

Retransmission count on LAPD. This is the number of times for which a message is retransmitted on LAPD when it is not acknowledged by the partner.

Range : [1-1024]

Default : 3

t200

Retransmit timer on LAPD, expressed in tenths of second (time waited for by the system before re-transmitting an unacknowledged packet).

Range : [1-1024] (but must be smaller than T203)

Default : 10 (1 second)

t203

LAPD idle timer, expressed in tenths of second.

Range : [T200-1024]

Default : 150 (15 seconds)

lapd modulo

LAPD modulo of operation; must be either 8 or 128.

Range : {8, 128}

Default : 128

max layer 3 packet size supported

Maximum size of data packets generated by layer 3 on this circuit, in bytes.

Range : [500-1500]

Default : 1492

isis hello timer

Default ISIS Hello Timer, in seconds.

Range : [1-65535]

Default : 3

level 1 default metric

Default level 1 circuit metric value (this parameter says the cost of using this circuit to the level 1 routing algorithm).

Range : [1-63]

Default : 20

level 2 default metric

Default level 2 circuit metric value (this parameter says the cost of using this circuit to the level 2 routing algorithm).

Range : [1-63]

Default : 20

external domain

Flag saying whether the external domain attribute is set for this circuit. If this attribute is set, neither ISIS nor ESIS routing PDU:s are either sent, or processed when received, on this circuit.

Range : {TRUE, FALSE}

Default : FALSE

ISO 9542 is configuration timer

Default ISO 9542 IS configuration timer, in seconds (that is, ISH packet generation timer).

Range : [1-21845]

Default : 10

ISO 9542 es configuration timer

Default ISO 9542 ES configuration timer, in seconds.

Range : [1-21845]

Default : 600 (10 minutes)

holding time multipl.

Default ISO 9542 Holding time multiplier.

Range : [2-63]

Default : 3

Message:

Configuration of Connection-less Network Service

(template file: s clns)

Protocol stack Layer #3 Configuration

```
#
# message: set configuration of connection-less network service
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 11
#
# router type (1 = level 1 router; 3 = level 1 and level 2 router). def = 1
00 00 00 01
#
# partition repair enabled (1 = enabled; 0 = disabled). def = 0
00 00 00 00
#
# system id length (range: 1 to 6). def = 6
00 00 00 06
#
# ISO 8473 clns options
#   bit 0: Complete Source Routing supported
#   bit 1: Partial Source Routing supported
#   bit 2: Set E/R in originated Data NPDU's
#   bit 3: US GOSIP V1 Unclassified Security supported
#   bit 4: US GOSIP Vd21 Unclassified Security supported
#
#   def = 0
00
#
# ISO 8473 clnp checksum on orig. npdu
# (1 = enabled; 0 = disabled). def = 0
00 00 00 00
#
# ISO8473 clnp lifetime (range: 1 to ff). def = 40 (64 hops or 32 seconds)
00 00 00 40
#
# max paths split (range: 1 to 2). def = 2
00 00 00 02
#
# max area addresses(range: 1 to 0c ). def = 3
00 00 00 03
#
# minimum lsp transmission interval (range: 1 to ffff) in seconds. def = 5
00 00 00 05
#
# maximum lsp generation interval (range: 1 to ffff) in seconds.
# def = 384 (900 seconds)
00 00 03 84
#
# minimum lsp generation interval (range: 1 to ffff) in seconds.
# def = 1e (30 seconds)
00 00 00 1e
#
# minimum broadcast lsp transm interval (range: 1 to ffff) in millisecs.
```

```
# def = 21 (33 milliseconds)
00 00 00 21
#
# complete snp interval (range: 1 to 258) in seconds.
# def = 0a (10 seconds)
00 00 00 0a
#
# partial snp interval (range: 1 to ffff) in seconds. def = 2 (2 seconds)
00 00 00 02
#
# poll es hello rate (range: 1 to ffff) in seconds. def = 32 (50 seconds)
00 00 00 32
#
# waiting time (range: 1 to ffff) in seconds. def = 3 (60 seconds)
00 00 00 3c
#
# designated router isis hello timer (range: 1 to ffff) in seconds.
# def = 1 (1 second)
00 00 00 01
#
# originating lev1 lsp buffer size (range: 200 to 5d4). def = 5d4
# (1492 bytes)
00 00 05 d4
#
# originating lev2 lsp buffer size (range: 200 to 5d4). def = 5d4
# (1492 bytes)
00 00 05 d4
#
# max virtual adjacencies (range: 0 to 1f). def = 2
00 00 00 02
#
# manual area address[2] length (range: 1 to (13 - system id length))
# if length = 0 then no manual area address[2] configured. def = 0
00
#
# manual area address[2] data
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
#
# manual area address[3] length (range: 1 to (13 - system id length))
# if length = 0 then no manual area address[3] configured. def = 0
00
# manual area address[3] data
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
#
# end of message
```

router type

IS-IS router type. May be 1 (level 1 routing only), or 3 (both level 1 and level 2 routing).

Range : { 1, 3 }

Default : 1

system id length

System Id length, within the NSAP address, in bytes.

Note that all the systems within a ISIS domain must have the same length for the System Id.

Range : [1-6]

Default : 6

clnp lifetime

Lifetime of the originated packets, as described in ISO 8473, in 500-milliseconds units.

Range : [1-255]

Default : 64 (32 seconds, or 64 hops)

minimum lsp transmission interval

Default minimum LSP Transmission interval, in seconds.

Range : [1-65535]

Default : 5

maximum lsp generation interval

Default maximum LSP generation interval, in seconds.

Range : [1-65535]

Default : 900 (15 minutes)

minimum lsp generation interval

Default minimum LSP generation interval, in seconds.

Range : [1-65535]

Default : 30

minimum broadcast lsp transm interval

Default minimum broadcast LSP transmission interval, in seconds.

Range : [1-65535]

Default : 33

complete snp interval

Default Complete Sequence Number PDU interval, in seconds.

Range : [1-600]

Default : 10

partial snp interval

Default Partial Sequence Number PDU interval, in seconds.

Range : [1-600]

Default : 2

designated router isis hello timer

Default Designated Router ISIS hello timer, in seconds.

Range : [1-65535]

Default : 1

originating lev1 lsp buffer size

Default originating level 1 LSP Buffer Size, in bytes.

Range : [512-1492]

Default : 1492

originating lev2 lsp buffer size

Default originating level 2 LSP Buffer Size, in bytes.

Range : [512-1492]

Default : 1492

Message:

Configuration of Reachable Address Prefix

(template file: s_addrap)

Protocol stack Layer #3 Configuration

```
#
# message: add reachable prefix address/manual adjacency
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
30 0A 39
#
# ra prefix/manual adj identifier (range: 1 to 40). def = 1
00 00 00 01
#
# ra prefix/manual adj type
#   values:
#       0:reachable address prefix on broadcast circuit
#       1:reachable address prefix on point-to-point circuit
#       2>manual adjacency on broadcast
#       3>manual adjacency on point-to-point circuit
# def = 1
00 00 00 01
#
#if reachable address prefix
#   ra prefix length in semi-octets (range: 0 to 28)
#
#if manual adjacency
#   number of destination system ids
#   (must be >=1 and <=(14/system id length)
#def = 0
00 00 00 00
#
#if reachable address prefix
#   ra prefix data (starting from first octets of the field)
#
#if manual adjacency
#   destination system ids (first system id start from the first
#   octet of the field, if other system ids
#   are present they start after the last
#   octet of the previous system id)
#
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
#
# ra prefix default metric (range: 1 to 3f). def = 14 (20)
#not used for manual adjacencies
00 00 00 14
#
# if prefix/manual adj on point-to-point circuit
#   dcc channel identifier (is defined by):
#
#       card_id = (2..7/12..14)
#       dcc_type = 0 if DCCR, 1 if DCCM
#Each field on four bytes and on different lines without comment.
#Example:
#   00 00 00 07
#   00 00 00 00
#
#else if prefix/manual adj on broadcast circuit
```

```
# snpa (mac address) of the destination system
#
# def = 00 00 00 00 00 00
00 00 00 00 00 00
#
# end of message
```

Message:

Delete of Reachable Address Prefix **(template file: s_delrap)**

Protocol stack Layer #3 Configuration

```
#
# message: delete reachable prefix address/manual adjacency
# from the configured set
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
40 0A 39
#
# ra prefix/manual adj identifier (range: 1 to 40). def = 1
00 00 00 01
#
# end of message
```

Message:

Configuration of Ethernet Channels

(template file: s_eth)

Protocol stack Layer #3 Configuration

```
#
# message: set configuration of ethernet circuit
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 19
#
# circuit operational state (1 = enabled; 0 = disabled). def = 1
00 00 00 01
#
# max packet size supported (range: 1f4 to 5dc). def = 5d4 (1492)
00 00 05 d4
#
# isis hello timer (range: 1 to ffff). def = 3
00 00 00 03
#
# level 1 default metric (range: 1 to 3f). def = 14 (20)
00 00 00 14
#
# level 2 default metric (range: 1 to 3f). def = 14 (20)
00 00 00 14
#
# external domain (1 = enabled; 0 = disabled). def = 0
00 00 00 00
#
# ISO 9542 options:
#     bit 0 = configuration
#     bit 1 = redirect
#     bit 2 = notification
#     bit 3 = checksum
#
#     def = configuration | redirect | notification = 07
07
#
# level 1 designated router priority (range: 1 to 7f). def = 40 (64)
00 00 00 40
#
# level 2 designated router priority (range: 1 to 7f). def = 40 (64)
00 00 00 40
#
# level 2 only circuit (1 = enabled; 0 = disabled). def = 0
00 00 00 00
#
# ISO 9542 redirect timer (range: 1 to ffff) in seconds.
# def = 708 (1800 seconds)
00 00 07 08
#
# ISO 9542 is configuration timer (range: 1 to ffff) in seconds. def = a (10)
00 00 00 0a
#
# ISO 9542 es configuration timer (range: 1 to ffff) in seconds.
# def = 258 (600)
00 00 02 58
#
# ISO 9542 holding time multipl. (range: 1 to 3f). def = 3
```

```
00 00 00 03
#
# end of message
```

max packet size supported

Maximum size of data packets generated by layer 3 on this circuit, in bytes.

Range : [500-1500]

Default : 1492

isis hello timer

Default ISIS Hello Timer, in seconds.

Range : [1-65535]

Default : 3

level 1 default metric

Default level 1 circuit metric value (this parameter says the cost of using this circuit to the level 1 routing algorithm).

Range : [1-63]

Default : 20

level 2 default metric

Default level 2 circuit metric value (this parameter says the cost of using this circuit to the level 2 routing algorithm).

Range : [1-63]

Default : 20

external domain

Flag saying whether the external domain attribute is set for this circuit. If this attribute is set, neither ISIS nor ESIS routing PDU:s are either sent, or processed when received, on this circuit.

Range : {TRUE, FALSE}

Default : FALSE

is configuration timer

Default ISO 9542 IS configuration timer, in seconds (that is, ISH packet generation timer).

Range : [1-21845]

Default : 10

es configuration timer

Default ISO 9542 ES configuration timer, in seconds.

Range : [1-21845]

Default : 600 (10 minutes)

holding time multipl.

Default ISO 9542 Holding time multiplier.

Range : [2-63]

Default : 3

Message:

Configuration of Transport Module

(template file: s_tp4)

Protocol stack Layer #4 Configuration

```
#
# message: set configuration of transport
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 45
#
# inactivity timer (range: 1 to ffff) in tenths of second. def = 500 (128)
00 00 05 00
#
# initial retransmit timer (range: 1 to ffff) in tenths of second.
# def = 50 (8)
00 00 00 50
#
# lower bound for retransmit timer (range: 1 to ffff) in tenths of second.
# def = 50 (8)
00 00 00 50
#
# upper bound for retransmit timer (range: 1 to ffff) in tenths of second.
# def = 50
00 00 00 50
#
# window timer (range: 1 to ffff) in tenths of second. def = a0 (16 seconds)
00 00 00 a0
#
# local acknowledgement delay (range: 1 to ffff) in millisec. def = 64 (100)
00 00 00 64
#
# local flow control interval (range: 1 to ffff) in millisec. def = 64 (100)
00 00 00 64
#
# initial window size (range: 1 to ff). def = 2
00 00 00 02
#
# max retransmit count (range: 1 to ff). def = 04
00 00 00 04
#
# credit (target window size) (range: 1 to ff). def = 8
00 00 00 08
#
# max tpdu size (valid values:0 = size 128, 1 = size 256, 2 = size 512,
#                               3 = size 1024). def = 3 (1024)
00 00 00 03
#
# end of message
```

inactivity timer

The amount of time for which Transport maintains a layer 4 connection on which no data is being transferred, before it terminates the connection. It is expressed in tenths of second.

Range : [1-65535]

Default : 1280 (128 seconds)

initial retransmit timer

The amount of time for which Transport initially waits without receiving a TPDU's acknowledgement, before it retransmits the TPDU.

Transport automatically adjust this parameter's value individually for each connection, based on peer entity responsiveness (and, implicitly, network performance).

Range : [<LowerRetransmitTime>-<UpperRetransmitTime>]

Default : 80 (8 seconds)

lower bound for retransmit timer

Lower bound for the retransmit time.

Range : [1-<UpperRetransmitTime>]

Default : 80 (8 seconds)

upper bound for retransmit timer

Upper bound for the retransmit time.

Range : [<LowerRetransmitTime>-65535]

Default : 80 (8 seconds)

window timer

The period of inactivity that can occur before Transport sends a hello packet to the peer entity with which a connection is established (in tenths of second). Must be bigger than the Local Acknowledgement delay (note that the Local Acknowledgement delay is expressed in milliseconds).

Range : [1-65535]

Default : 160 (16 seconds)

local acknowledgement delay

The maximum amount of time for which Transport can delay acknowledging a TPDU it receives (in milliseconds).

Must be lower than the Window timer (note that the Window timer is expressed in tenths of seconds).

Range : [1-65535]

Default : 100 (0.1 seconds)

NOTE (*) NOTE (*) On the ADM-1 equipment, since release 4.1, the default value of this parameter has been raised up to 500 (0.5 seconds), to reduce the connection maintenance traffic on the network.

local flow control interval

Available resources check interval (in milliseconds).

If Transport has no receive credit available, it checks the available resources each time the interval specified by this parameter has passed, until credit becomes available.

Range : [1-65535]

Default : 100 (0.1 seconds)

initial window size

The initial number of unacknowledged TPDU's that can be outstanding on a connection. Transport will automatically adjust the window size up to the Credit value.

Range : [1-255]

Default : 2

max retransmit count

Maximum number of times for which the local transport entity will retry to transmit a TPDU that requires acknowledgement.

Range : [1-255]

Default : 20

credit (target window size)

The expected window size, that is, a target value for the maximum number of unacknowledged TPDU:s that can be outstanding on a connection.

Range : [1-255]

Default : 8

max tpdu size

The maximum size of a TPDU, in octets.

Range : { 128, 256, 512, 1024 }

Default : 1024

Message:

Restart OSI Protocol Stack

(template file: s_osirst)

Protocol stack restart

```
#
# message: restart osi protocols using configured values
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 2C
# OSI command
00 00 00 00
#
# end of message
```

Message:

Update OSI protocol stack

(template file: s_osiupt)

Protocol stack update

```
#
# message: update osi protocols
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 2C
# OSI command
00 00 00 01
#
# end of message
```

Example of Static Routing Configuration using the OSI Setup Option

As described in the previous paragraphs, the management of the IS-IS protocol allows to configure static routes, alias RAP:s (Reachable Address Prefixes) and MESA:s (Manual End System Adjacencies).

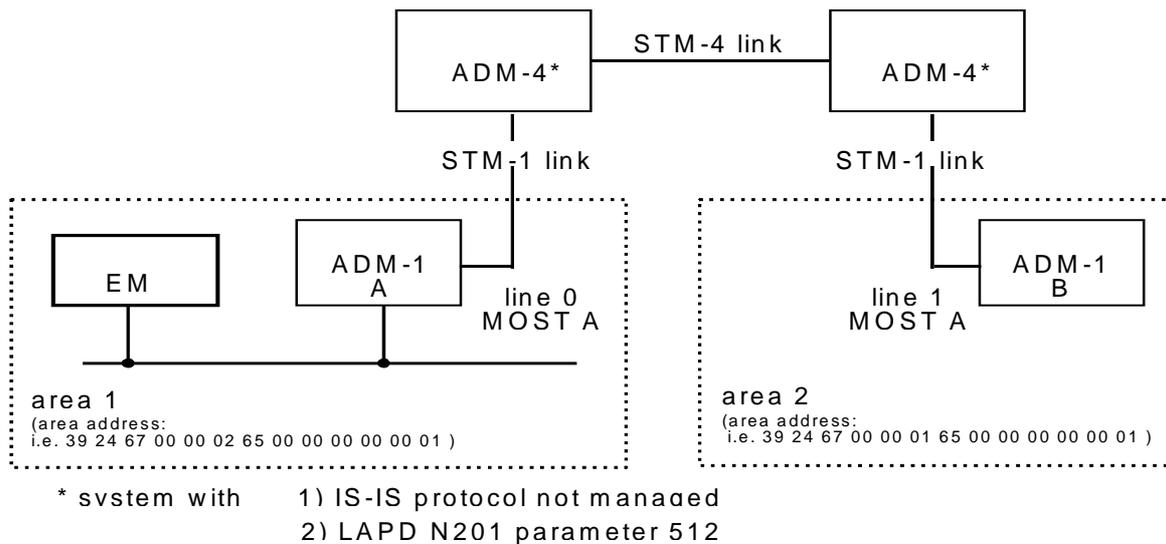
A RAP is a prefix of an NSAP address which is associated to either a point to point or a broadcast circuit. If the RAP is associated to a broadcast circuit, then there is also a ethernet MAC address associated to it.

A Manual End System Adjacency is a static adjacency to a number of systems. The system on which the adjacency is configured assumes that the circuit gives access to the Manual End System neighbours (as after a dynamic exchange of ES-IS packets between the ES and these neighbours).

If the equipment has to forward a packet, and it cannot forward it by means of the dynamic information got by ISIS LSP:s, then it looks at its reachable address prefixes table (made up of both RAP:s configured on this equipment by the operator, and RAP:s configured on other level 2 routers and read by this equipment in the LSP:s generated by such routers). If the packet to be forwarded matches at least one prefix, then it is forwarded onto the circuit associated to the longest prefix (best match). If there are more matching prefixes with the same, highest, length, then the packet is forwarded onto the circuit associated to the prefix with the lowest cost (if the cost is the same, the choice is random).

If the prefix is associated to the ethernet circuit, then the packet is sent onto the ethernet circuit addressed to the MAC address associated to the prefix itself.

In the following an example is given of static routing configuration necessary for the communication between two ADM-1s, connected through ADM-4 equipment of a different vendor which do not support the IS-IS protocol and accept a LAPD N201 parameter of 512 (minimum allowed by ITU-T Rec. G.784).



ADM-1 A Configuration Example

1. Make a copy of the template file for the configuration of Connection-less Service (s_clns) in the Control Application PC (the file is located on the Control Application installation directory, in the OSI sub-directory) :

```
copy s_clns s_clns.1
```

2. Edit the copied file (edit s_clns.1) and modify the following parameters (configure the equipment as a IS-IS level2 router):

```
# router type (1 = level 1 router; 3 = level 1 and level 2 router). def = 1
00 00 00 03
```

3. Make a copy of the template file for the configuration of a DCC profile (s_dccp0) in the Control Application PC (the file is located on the Control Application installation directory, in the OSI sub-directory) :

```
copy s_dccp0 s_dccp0.1
```

4. Edit the copied file (edit s_dccp0.1) and modify the following parameters:

```
# dcc profile identifier (range: 0 to 4). def = 0
00 00 00 01
```

Define non-default profile 1

```
# max layer 3 packet size supported (range: 1f4 to 5dc).
# def = 5d4 (1492 bytes) (02 00 = 512 bytes)
00 00 02 00
```

Set 512 as the maximum size of the data packets originated by layer 3

```
# external domain (1 = enabled; 0 = disabled). def = 0
00 00 00 01
```

Enable the external domain attribute

- 5.** Make a copy of the template file for the configuration of Reachable Address Prefix (s_addrap) in the Control Application PC (the file is located on the Control Application installation directory) :

```
copy s_addrap s_addrap.1
```

- 6.** Edit the copied file (edit s_addrap.1) and modified the following parameters:

```
# ra prefix/manual adj type
#   values:
#       0:reachable address prefix on broadcast circuit
#       1:reachable address prefix on point-to-point circuit
#       2>manual adjacency on broadcast
#       3>manual adjacency on point-to-point circuit
# def = 1
00 00 00 01
#
```

Define the circuit as a point-to-point circuit

```
#if reachable address prefix
#       ra prefix length in semioctets (range: 0 to 28)
#
#if manual adjacency
#       number of destination system ids
#       (must be>=1 and <=(14/system id lenght)
#def = 0
00 00 00 1A
```

1A means a prefix length of 26 semioctets (13 bytes)

```
#if reachable address prefix
#       ra prefix data (starting from first octets of the field)
#
#if manual adjacency
#       destination system ids (first system id start from the first
#                               octet of the field, if other system ids
#                               are present they starts after the last
#                               octet of the previous system id)
#
39 24 67 00 00 01 65 00 00 00 00 01 00 00 00 00 00 00
```

The above prefix is the same as the area address of "area 2" (the value is just an example)

```
# if prefix/manual adj on point-to-point circuit
#   dcc channel identifier (is defined by):
#
#       card_id = (2..7/12..14)
#       dcc_type = 0 if DCCR, 1 if DCCM
#Each field on four bytes and on different lines without comment.
#Example:
#   00 00 00 07
#   00 00 00 00
00 00 00 02
00 00 00 00
#
#else if prefix/manual adj on broadcast circuit
#   snpa (mac address) of the destination system
#
# def = 00 00 00 00 00 00
00 00 00 00 00 00
```

The prefix addresses the point to point circuit associated to the DCCr channel on line 0 of MOST A

7. Edit a new file (i.e. edit MSH11C_a.msg) with the list of configuration files to send:

```
s_clns.1
s_dccp0.1
s_addrap.1
s_osiupt
```

The last row (s_osiupt) is necessary to make the new configuration effective.

8. Select with the Control Application the OSI Setup option.
9. Select as file to send MSH11C_a.msg and confirm the operation.

ADM-1 B Configuration Example

For the ADM-1 B system it is possible to use the files for the configuration of connection-less service and DCC profile already created for ADM-1 A (s_clns.1 and s_dccp0.1).

1. Make a copy of the file for the configuration of Reachable Address Prefix on ADM-1 A (s_addrap.1) in the Control Application PC :

```
copy s_addrap.1 s_addrap.2
```

2. Edit the copied file (edit s_addrap.2) and modified the following parameters:

```
#if reachable address prefix
#           ra prefix data (starting from first octets of the field)
#
#
# if manual adjacency
#           destination system ids (first system id start from the first
#           octet of the field, if other system ids
#           are present they starts after the last
#           octet of the previous system id)
#
39 24 67 00 00 02 65 00 00 00 00 01 00 00 00 00 00 00
```

The above prefix is the same as the area address of "area 1" (the value is just an example)

```
# if prefix/manual adj on point-to-point circuit
#   dcc channel identifier (is defined by):
#
#           card_id = (2..7/12..14)
#           dcc_type = 0 if DCCR, 1 if DCCM
#Each field on four bytes and on different lines without comment.
#Example:
#   00 00 00 07
#   00 00 00 00
00 00 00 03
00 00 00 00
#
# else if prefix/manual adj on broadcast circuit
#   snpa (mac address) of the destination system
#
# def = 00 00 00 00 00 00
00 00 00 00 00 00
```

The prefix addresses the point to point circuit associated to the DCCr channel on line 1 of MOST A

3. Edit a new file (i.e. edit MSH11C_b.msg) with the list of configuration files to send:

```
s_clns.1
s_addrap.2
s_osiupt
```

The last row (s_osiupt) is necessary to make the new configuration effective.

4. Select with the Control Application the OSI Setup option.

5. Select as file to send MSH11C_b.msg and confirm the operation.

```
file: s_clns.1
#
# message: set configuration of connection-less network service
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 11
#
# router type (1 = level 1 router; 3 = level 1 and level 2 router). def = 1
00 00 00 03
#
# partition repair enabled (1 = enabled; 0 = disabled). def = 0
00 00 00 00
#
# system id length (range: 1 to 6). def = 6
00 00 00 06
#
# ISO 8473 clns options
#   bit 0: Complete Source Routing supported
#   bit 1: Partial Source Routing supported
#   bit 2: Set E/R in originated Data NPDU's
#   bit 3: US GOSIP V1 Unclassified Security supported
#   bit 4: US GOSIP Vd21 Unclassified Security supported
#
#   def = 0
00
#
# ISO 8473 clnp checksum on orig. npdu
# (1 = enabled; 0 = disabled). def = 0
00 00 00 00
#
# ISO8473 clnp lifetime (range: 1 to ff). def = 40 (64 hops or 32 seconds)
00 00 00 40
#
# max paths split (range: 1 to 2). def = 2
00 00 00 02
#
# max area addresses(range: 1 to 0c ). def = 3
00 00 00 03
#
# minimum lsp transmission interval (range: 1 to ffff) in seconds. def = 5
00 00 00 05
#
# maximum lsp generation interval (range: 1 to ffff) in seconds.
# def = 384 (900 seconds)
00 00 03 84
#
# minimum lsp generation interval (range: 1 to ffff) in seconds.
# def = 1e (30 seconds)
00 00 00 1e
#
# minimum broadcast lsp transm interval (range: 1 to ffff) in millisecs.
# def = 21 (33 milliseconds)
00 00 00 21
#
# complete snp interval (range: 1 to 258) in seconds.
# def = 0a (10 seconds)
00 00 00 0a
#
# partial snp interval (range: 1 to ffff) in seconds. def = 2 (2 seconds)
00 00 00 02
#
# poll es hello rate (range: 1 to ffff) in seconds. def = 32 (50 seconds)
```

```
00 00 00 32
#
# waiting time (range: 1 to ffff) in seconds. def = 3 (60 seconds)
00 00 00 3c
#
# designated router isis hello timer (range: 1 to ffff) in seconds.
# def = 1 (1 second)
00 00 00 01
#
# originating lev1 lsp buffer size (range: 200 to 5d4). def = 5d4
# (1492 bytes)
00 00 05 d4
#
# originating lev2 lsp buffer size (range: 200 to 5d4). def = 5d4
# (1492 bytes)
00 00 05 d4
#
# max virtual adjacencies (range: 0 to 1f). def = 2
00 00 00 02
#
# manual area address[2] length (range: 1 to (13 - system id length))
# if length = 0 then no manual area address[2] configured. def = 0
00
#
# manual area address[2] data
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
#
# manual area address[3] length (range: 1 to (13 - system id length))
# if length = 0 then no manual area address[3] configured. def = 0
00
# manual area address[3] data
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
#
# end of message

file: s_dccp0.1

# message: set configuration of dcc profiles
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
20 0A 16
#
# dcc profile identifier (range: 0 to 4). def = 0
00 00 00 01
#
# n201 (lapd frame size) (range: 0 to 5e9). def = 5e9
00 00 05 e9
#
# k (lapd window size)
# (range: 0 to 7 if lapd modulo = 0; 0 to 7f if lapd modulo = 1). def = 7
00 00 00 07
#
# n200 (lapd retransmission count) (range: 0 to 400). def = 3
00 00 00 03
#
# lapd congestion timer (range: 1 to 400) in tenths of second.
# def = a (1 second)
00 00 00 0a
#
# t200 (lapd retransmit timer) (range: 1 to 400) in tenths of second.
# def = a (1 second)
00 00 00 0a
#
# t203 (lapd idle timer) (range: 1 to 400) in tenths of second.
```

```
# def = 96 (15 seconds)
00 00 00 96
#
# lapd modulo (0 = modulo 8 operation; 1 = modulo 128 operation).
# def = 1
00 00 00 01
#
# max layer 3 packet size supported (range: 1f4 to 5dc).
# def = 5d4 (1492 bytes)
00 00 02 00
#
# isis hello timer (range: 1 to ffff) in seconds. def = 3
00 00 00 03
#
# level 1 default metric (range:1 to 3f). def = 14 (20)
00 00 00 14
#
# level 2 default metric (range:1 to 3f). def = 14 (20)
00 00 00 14
#
# external domain (1 = enabled; 0 = disabled). def = 0
00 00 00 01
#
# ISO 9542 options:
#     bit 0 = configuration
#     bit 1 = redirect
#     bit 2 = notification
#     bit 3 = checksum
#
#     def = configuration | redirect | notification = 7
07
#
# ISO 9542 is configuration timer (range: 1 to ffff) in seconds.
# def = 0a (10 seconds)
00 00 00 0a
#
# ISO 9542 es configuration timer (range: 1 to ffff) in seconds.
# def = 258 (600 seconds)
00 00 02 58
#
# ISO 9542 holding time multipl. (range: 1 to 3f). def = 3
00 00 00 03
#
# end of message
```

```
file: s_addrap.1

#
# message: add reachable prefix address/manual adjacency
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
30 0A 39
#
# ra prefix/manual adj identifier (range: 1 to 40). def = 1
00 00 00 01
#
# ra prefix/manual adj type
#   values:
#       0:reachable address prefix on broadcast circuit
#       1:reachable address prefix on point-to-point circuit
#       2>manual adjacency on broadcast
#       3>manual adjacency on point-to-point circuit
# def = 1
00 00 00 01
#
#if reachable address prefix
#   ra prefix length in semi-octets (range: 0 to 28)
#
#if manual adjacency
#   number of destination system ids
#   (must be >=1 and <=(14/system id length))
#def = 0
00 00 00 1A
#
#if reachable address prefix
#   ra prefix data (starting from first octets of the field)
#
#if manual adjacency
#   destination system ids (first system id start from the first
#   octet of the field, if other system ids
#   are present they starts after the last
#   octet of the previous system id)
#
39 24 67 00 00 01 65 00 00 00 00 00 01 00 00 00 00 00 00
#
# ra prefix default metric (range: 1 to 3f). def = 14 (20)
#not used for manual adjacencies
00 00 00 14
#
# if prefix/manual adj on point-to-point circuit
#   dcc channel identifier (is defined by):
#
#   card_id = (2..7/12..14)
#   dcc_type = 0 if DCCR, 1 if DCCM
#Each field on four bytes and on different lines without comment.
#Example:
#   00 00 00 07
#   00 00 00 00
00 00 00 02
00 00 00 00
#
#else if prefix/manual adj on broadcast circuit
#   snpa (mac address) of the destination system
#
# def = 00 00 00 00 00 00
00 00 00 00 00 00
#
# end of message
```

```
file: s_addrap.2

#
# message: add reachable prefix address/manual adjacency
# all values are in hexadecimal
#
# message header (DO NOT CHANGE)
30 0A 39
#
# ra prefix/manual adj identifier (range: 1 to 40). def = 1
00 00 00 01
#
# ra prefix/manual adj type
#   values:
#       0:reachable address prefix on broadcast circuit
#       1:reachable address prefix on point-to-point circuit
#       2>manual adjacency on broadcast
#       3>manual adjacency on point-to-point circuit
# def = 1
00 00 00 01
#
#if reachable address prefix
#   ra prefix length in semi-octets (range: 0 to 28)
#
#if manual adjacency
#   number of destination system ids
#   (must be >=1 and <=(14/system id length))
#def = 0
00 00 00 1A
#
#if reachable address prefix
#   ra prefix data (starting from first octets of the field)
#
#if manual adjacency
#   destination system ids (first system id start from the first
#   octet of the field, if other system ids
#   are present they start after the last
#   octet of the previous system id)
#
39 24 67 00 00 01 65 00 00 00 00 00 01 00 00 00 00 00 00
#
# ra prefix default metric (range: 1 to 3f). def = 14 (20)
#not used for manual adjacencies
00 00 00 14
#
# if prefix/manual adj on point-to-point circuit
#   dcc channel identifier (is defined by):
#
#   card_id = (2..7/12..14)
#   dcc_type = 0 if DCCR, 1 if DCCM
#Each field on four bytes and on different lines without comment.
#Example:
#   00 00 00 07
#   00 00 00 00
00 00 00 03
00 00 00 00
#
#else if prefix/manual adj on broadcast circuit
#   snpa (mac address) of the destination system
#
# def = 00 00 00 00 00 00
00 00 00 00 00 00
#
# end of message
```