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The ATM Forum
Technical Committee

Conformance Abstract Test Suite for the UNI 3.0 ATM Layer of Intermediate Systems

af-test-0030.000

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Conformance Abstract Test Suite for the UNI 3.0
ATM Layer of Intermediate Systems

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1. Introduction

This Abstract Test Suite (ATS) is the first version of the ATM layer ATS for intermediate systems. This ATS is based on the ATM Layer protocol as described in the ATM Forum ATM User-Network Interface (UNI) Specification, version 3.0 [1]. This abstract test suite is only a part of a complete Conformance Test Suite for the ATM Layer. The other part of this test suite will cover the ATM Layer in end systems (Broadband Terminals for example). This test suite was designed for point-to-point configurations only, and does not include point-to-multipoint configurations. This ATS for Intermediate systems includes cell switching for OAM F4 and F5 cells.

The Protocol Implementation eXtra Information for Testing (PIXIT) proforma is provided in Annex A. The PIXIT questionnaire needs to be completed for a particular Intermediate System equipment (Implementation Under Test) prior to conformance testing.

1.1 Definition of Terminologies

For the purposes of conformance testing, the following definitions are used:

End System:	A system is either a virtual channel (VC) or a virtual path (VP) end point which is a logical termination of the VC Connection (VCC) or the VP Connection (VPC). In Figure 1-3 of the ATM Forum UNI Specification, Version 3.0, this is referred to as an ATM End-Point.
Intermediate System:	An intermediate system is located between the two End Systems. It can be an end point of a VPC, but it can not be an end point of a VCC. In Figure 1-3 of the ATM Forum UNI Specification Version 3.0, this is referred to as either a Private ATM Switch or a Public ATM Switch.

2. Methodology

This conformance test suite has been developed as described in ISO/IEC International Standard 9646-1 and 2 [2][3]. A complete set of test purposes has been developed after study of the ATM UNI Specification and a selection of the appropriate test groups. The remote test method has been selected, as shown below, and test cases have been generated. The notation used in the abstract test suite is the Tree and Tabular Combined Notation (TTCN) as described in ISO/IEC IS 9646-3 [4]. This version of the ATM Layer conformance test suite uses sequential TTCN, but conversion into concurrent TTCN will bring some improvement in the test case description and implementation.

3. Test Configuration

The test configuration used for Intermediate Systems is given in Figure 1. The ATM tester has two Points of Control and Observation (PCOs) corresponding to two ports on the Implementation Under Test (IUT). PCO_A will provide the IUT with test stimuli which will provoke an action from the IUT. This will result in an output signal which will be monitored by either PCO_A or PCO_B. This test configuration is consistent with the remote test method chosen for testing Intermediate Systems. This configuration may be used for testing the handling of OAM F4 and F5 ATM cell flows, when an intermediate system is also an F4 or F5 segment endpoint, by using only one PCO (i.e., PCO_A).

For cell switching, the test cases were developed with the assumption that the IUT has the point-to-point capability. Only the point-to-point configurations are tested (one incoming port and only one outgoing port); this does not include testing where there is one incoming port and several outgoing ports.

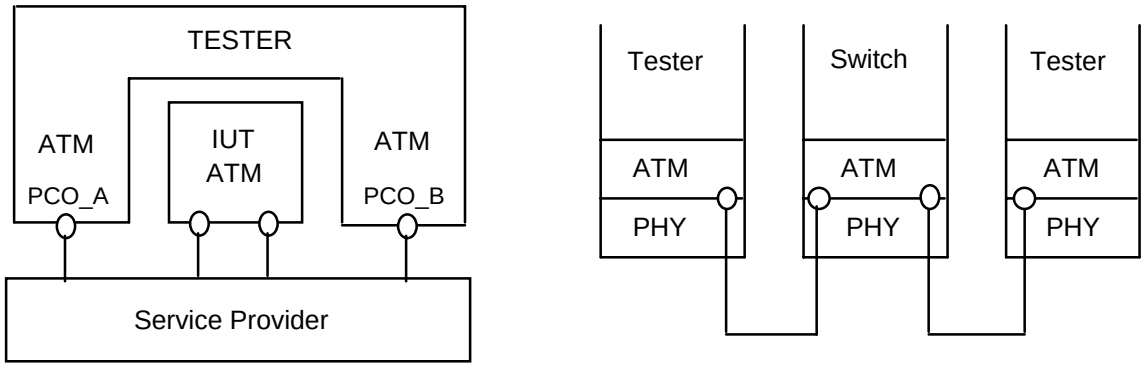

Figure 1. Configuration for testing of an intermediate system

In this first version of the ATS we will assume that the input and output signals can be treated independently. This is possible based on the TTCN model in which (1) messages in the FIFO input queue for each PCO are retrieved only when a READ event for that PCO is executed and (2) the FIFO queues for each PCO are independent from each other. This way it is possible to send a sequence of cells to the IUT and handle the responses later.

4. Test Suite Structure

The Test Groups for intermediate systems are:

- ATM Layer Services

- ATM Cell Structure and Encoding at the UNI (General)
  - GFC
  - VPI/VCI
  - PT
  - CLP
  - HEC

- ATM Layer Functions at the UNI (U-plane)
  - Multiplexing among different ATM connections
  - Cell Rate Decoupling (unassigned cells)
  - Cell discrimination based on pre-defined header field values
    - ATM Cell discrimination for the VCI
    - Payload type discrimination
    - Loss priority indication and Selective cell discarding
    - Traffic shaping

- ATM Layer Management Specification (M-plane)
  - Information Flows
  - ATM OAM Cell Format
  - Fault Management
    - Alarm Surveillance
    - Connectivity verification
      - End-to-End Loopback
      - UNI Loopback

5. Assumptions on the Capabilities of the Testers

5.1 Connection Setup

It is assumed that the test equipment provides means to establish a connection, independent from the use of Switched Virtual Connections (SVC) or Permanent Virtual Connections (PVC). In case SVCs are used, there has to be a way for the tester to determine which VPI/VCI is used, so that the appropriate values can be entered in the PIXIT.

5.2 Unassigned Cells

It is assumed that, if the physical layer requires this, the tester will generate unassigned cells if no data has to be sent. But if the Test Suite specifies the transmission of a cell, this cell should be sent at the first opportunity. This has to be done even if the Test Suite specifies an unassigned cell to be sent. In this case the unassigned cell should be generated to the specification given in the PDU Constraint. The ATS expects the tester will pass the stream of unassigned cells received from the IUT. Each test case will deal individually with the unassigned cells. In most of the cases, the unassigned cells will be ignored by the test case.

5.3 Error Generation

The tester is asked to generate errors in some test cases, to allow for testing of alarm conditions. The errors which should be generated are physical failures and virtual path/connection failures. How these errors are generated is left open to the tester and is therefore not specified in the test suite.

6. Timers

Four timers have been defined for testing. These timers are:

(1) T_Test is used to limit the total test time of each test case. When the test is waiting for a response, or no response from the IUT, it will start the timer. After expiry of T_Test, it will conclude that no response (besides the unassigned cells) is forthcoming. The suggested value for T_Test is 2 seconds.

(2) T_NoResp is used to limit the test time waiting for "no response" from the IUT. The suggested value for T_NoResp is 2 seconds.

(3) T_Opr is used to allow sufficient time for a test operator to initiate some test action. This timer is used in conjunction with an "Implicit send" for test coordination. The suggested value for T_Opr is 180 seconds.

(4) T_LB is the time within which the IUT has to return a Loopback cell. The default value for T_LB is 1 second.

These timers are not used to verify the exact timing of an implementation, but to limit the time which the test should wait for a message or to limit the total duration of the test. Default values are provided and can be used unless another value is desired.

7. Test Preparation

The tester has to take care of the establishment of the right Virtual Path and Virtual Circuit Connections. The test suite does not specify if these connections are Switched Virtual Connections (SVCs) or Permanent Virtual Connections (PVCs). It is left open to the tester to use either method dependent on which one is the most suitable to the IUT.

The VPCs and/or VCCs should be established prior to the execution of the conformance test suite and the appropriate values for the VPI and VCI should be entered in the PIXIT document. If the IUT supports both VP and VC switching, separate VP and VC connections have to be set up to allow testing of both capabilities in the same test run. The test operator will find instructions in Annex B for the establishment of the different connections.

For the OAM testing, both end-to-end and segment OAM flows[1] will be tested. For this ATS, which deals with ATM intermediate systems on the UNI only, this means that an IUT will represent one of the following systems:

- VP segment end system;
- VP connection end system;
- VC segment end system.

A VP segment end system will be any IUT which supports VP service and does not terminate a VP connection; a VP connection end system is an IUT which supports VP service and terminates a VP connection; a VC segment end system will be any IUT offering VC service.

It is impossible for an ATM intermediate system to be a VC connection end system; only ATM end systems will terminate a VC connection. ATM end systems will be tested in a separate test suite.

In case an IUT supports multiple configurations, the tester has to set up a separate connection for each applicable configuration, enter the VPIs and VCIs in the appropriate spaces in the PIXIT and run the test suite. It is also possible to test one configuration at a time.

The test cases are grouped in two parts. The first part represents the test cases which use a connection but do not affect it (the connection will be in the same state after the test execution as before), while the second group disturbs a connection and requires that it will be reestablished. These are the tests which deal with alarm signals caused by physical errors. If the connection is a SVC, it might be necessary to reenter the proper values for the VPI/VCIs in the PIXIT and the test suite. If the connection is a PVC, the reestablished connection will use the same VPI/VCIs. The testing can be continued without reentering the values in the PIXIT or test suite.

Although there is no restriction that the minimum and maximum values for VPI and VCI be the same for the incoming and outgoing ports, it is important for the test operator to make sure that the minimum and maximum values for VPI and VCI for the incoming are mapped properly to the outgoing ports for these test cases: Ver_VP_Min, Ver_VP_Max, Ver_VC_Min, and Ver_VC_Max.

Ver_Cell_Seq_VP has an additional requirement: the IUT must assign VPI values sequentially when setting up new connections. The test case should not be selected if the IUT does not assign connections this way, otherwise, the IUT will fail.

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[1] In section 3.5.2 of the ATM Forum UNI specification, version 3.0, a segment is defined as a single VP or VC link across the UNI.

8. Abbreviations

ATM	Asynchronous transfer mode
ATS	Abstract Test Suite
CLP	Cell Loss Priority
FIFO	First in/first out
GFC	Generic Flow Control
HEC	Header Error Control
ISO/IEC	International Organization for Standardization/International Electrotechnical Commission
IUT	Implementation Under Test
OAM	Operation and Maintenance
PCO	Point of Control and Observation
PDU	Protocol Data Unit
PHY	Physical Layer
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
PT	Payload Type
PVC	Permanent Virtual Connection
SVC	Switched Virtual Connection
TTCN	Tree and Tabular Combined Notation
UNI	User-Network Interface
VC	Virtual Channel
VCC	Virtual Channel Connection
VCI	Virtual Channel Identifier
VP	Virtual Path
VPC	Virtual Path Connection
VPI	Virtual Path Identifier

9. References

[1] "ATM User-Network Interface Specification, Version 3.0", ATM Forum, September 1993.

[2] ISO/IEC 9646-1 "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General Concepts", 1991.

[3] ISO/IEC 9646-2 "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract test suite specification", 1991.

[4] ISO/IEC 9646-3 "Information Technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 3: The tree and tabular combined notation", 1991.

[5] “PICS Proforma for the UNI 3.0 ATM Layer”, ATM-Forum/af-test-28.000, April 1995.

Annex A

Protocol Implementation eXtra Information for Testing (PIXIT) Proforma For Intermediate Systems

IUT

Name:

Version:

Machine Configuration:

Operating System Identification:

IUT Identification:

PICS Reference for IUT:

Limitations of the IUT :

General Information

1.	Does the physical interface used for testing require synchronous cell timeslot (e.g., SONET, DS3)? (PHY_SYNCH)	_____
2.	Give the maximum time it can take for a cell to be forwarded by the IUT. (2 seconds recommended) (NORESPtime)	_____
3.	Enter a sufficient amount of time to complete each test. (2 seconds recommended) (TESTtime)	_____
4.	Does the IUT generate a VP/VC-AIS after N consecutive HEC errors (Due to loss of cell delineation)? (HEC_AISpar)	_____
4.1	Number of consecutive HEC errors needed for VP/VC-AIS (default 6) (HEC_AISnum)	_____

OAM specific features

5.	Does the IUT support VC alarm signalling on any VCC? (VC_ALARMpar)	_____
6.	Does the IUT process the F4 flow while offering VC service only? (VC_F4_SUPpar)	_____

Virtual Path Connections

The following PIXIT questions are specific to the Virtual Path Connections (VPCs) by the IUT and only have to be answered if the VPCs are supported (see PICS).

7.1	Configure the IUT, setup a VPC and enter the VPI value on the source side here: (VPIvpca)	_____
7.2	Configure the IUT, setup a VPC and enter the VPI value on the destination side here: (VPIvpcb)	_____

8.1 Configure the IUT, setup a VP Connection for the minimum non-reserved VPI and enter the VPI value on the source side here: (VPIvpcbmin) _____

8.2 Configure the IUT, setup a VP Connection for the minimum non-reserved VPI and enter the VPI value on the destination side here: (VPIvpcamin) _____

8.3 Configure the IUT, setup a VP Connection for the maximum non-reserved VPI and enter the VPI value on the source side here: (VPIvpcamax) _____

8.4 Configure the IUT, setup a VP Connection for the maximum non-reserved VPI and enter the VPI value on the destination side here: (VPIvpcbmax) _____

Virtual Circuit Connections

The following PIXIT questions are specific to the Virtual Circuit Connections (VCCs) by the IUT and only have to be answered if the VCCs are supported (see PICS).

9.1 Configure the IUT, setup a VC Connection and enter the VPI/VCI values on the source side here: (VPIvcca) _____

(VCIvcca) _____

9.2 Configure the IUT, setup a VC Connection and enter the VPI/VCI values on the destination side here: (VPIvccb) _____

(VCIvccb) _____

10.1 Configure the IUT, setup a VC Connection for the minimum non-reserved VCI and enter the VCI value on the source side here: (VCIvccamin) _____

10.2 Configure the IUT, setup a VC Connection for the minimum non-reserved VCI and enter the VCI value on the destination side here: (VCIvccbmin) _____

10.3	Configure the IUT, setup a VC Connection for the maximum non-reserved VCI and enter the VCI value on the source side here: (VCIvccamax)	_____
10.4	Configure the IUT, setup a VC Connection for the maximum non-reserved VCI and enter the VCI value on the destination side here: (VCIvccbmax)	_____

Annex B

Connections required for testing

A total of 6 connections are needed to run the entire test suite for VP and VC service. These connections are:

VP Service

Standard VPC: VPIvpca --> VPIvpcb

- The switch can be configured to use any legal VPI values for this VPC, except the minimum and maximum VPIs.

Minimum VPC: VPIvpcamin --> VPIvpcbmin

- The switch must be configured to route from the minimum VPI of the incoming port, to the minimum VPI of the outgoing port. This was done simply to reduce the number of test suite parameters.

Maximum VPC: VPIvpcamax --> VPIvpcbmax

- The switch must be configured to route from the maximum VPI of the incoming port, to the maximum VPI of the outgoing port. This was done simply to reduce the number of test suite parameters.

Note: Typically the VCI used on these VPCs is Val_VCI = 32 (arbitrary)

VC Service

Standard VCC: VPIvcca/VCIvcca --> VPIvccb/VPIvccb

- The switch can be configured to use any legal VPI/VCI values for this VCC, except the minimum and maximum VPIs/VCIs.

Minimum VCC: VPIvcca/VCCvccamin --> VPIvccb/VPIvccbmin

- The switch must be configured to route from the minimum VCI of the incoming port, to the minimum VCI of the outgoing port, using the same VPIs as for the standard VCC. This was done simply to reduce the number of test suite parameters.

Maximum VCC: VPIvcca/VCCvccamax --> VPIvccb/VPIvccbmax

- The switch must be configured to route from the maximum VCI of the incoming port, to the maximum VCI of the outgoing port, using the same VPIs as for the standard VCC. This was done simply to reduce the number of test suite parameters.

Note: The standard VCC is also used as a VPC endpoint in the test suite.

Annex C

Abstract Test Suite

I

Test Suite Overview

Test Suite Structure

Suite Name : ATM_UNI_IS

Standards Ref : ATM Forum User Network Interface Specification, Version 3.0

PICS Ref : ATM−Forum/af−test−0028.000

PIXIT Ref : ATM_UNI_IS Annex A

Test Method(s) : Remote Test Method

Comments : This conformance test suite deals with intermediate systems only.

Test Group Reference	Selection Ref	Test Group Objective	Page Nr
General/		Verify general connectivity issues.	59
Cell_Discrimination/		Verify the ability of the IUT to perform cell discrimination.	70
Cell_Discrimination/VCI/		Verify the ability of the IUT to discriminate cells based on predefined VCI values.	70
Cell_Discrimination/PTI/		Verify the ability of the IUT todiscriminate cells based on PTI values.	71
M_plane/		Verify the ability of the IUT to perform M Plane functions.	76
M_plane/Information_Flows/		Verify general management information flows.	76
M_plane/OAM_Cell_Format/		Verify the format of the OAM cells.	79
M_plane/Fault_Management/		Verify fault management flows.	87
M_plane/Fault_Management/Alarm_Surveilance/		Verify the ability of the IUT to process alarm surveillance flows.	87
M_plane/Fault_Management/Connectivity_Verification/		Verify connectivity verification flows.	96
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/		Verify the ability of the IUT to process end−to−end loopback cells.	96
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/		Verify the ability of the IUT to process UNI loopback cells.	101

Detailed Comments :

Test Case Index

Test Group Reference	Test Case Id	Selection Ref	Description	Page Nr
General/	Ver_VP	VP_SERV	Verify that the IUT supports point−to−point VP connectivity.	59
General/	Ver_VC	VC_SERV	Verify that the IUT supports point−to−point VC connectivity.	60
General/	Ver_VP_Min	VP_SERV	Verify that the IUT relays cells on a VP connection for the minimum VPI value supported by the IUT.	61
General/	Ver_VP_Max	VP_SERV	Verify that the IUT relays cells on a VP connection for the maximum VPI value supported by the IUT.	62
General/	Ver_VC_Min	VC_SERV	Verify that the IUT relays cells on a VC connection for the minimum non−reserved VCI value supported by the IUT.	63
General/	Ver_VC_Max	VC_SERV	Verify that the IUT relays cells on a VC connection for the maximum non−reserved VCI value supported by the IUT.	64
General/	Ver_Cell_Seq_VP	VP_SERV	Verify that the IUT relays cells for a given VP and forwards all VCIs while preserving cell sequence integrity.	65
General/	Ver_Cell_Seq_VC	VC_SERV	Verify that the IUT relays cells for a given VC while preserving cell sequence integrity.	66
General/	Ver_GFC0_VP	VP_SERV	Verify that when the IUT receives non−zero GFC, it will encode all GFC bits to ‘0‘ in a VPC.	67
General/	Ver_GFC0_VC	VP_SERV	Verify that when the IUT receives non−zero GFC, it will encode all GFC bits to ’0’ in a VCC.	68

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Test Group Reference	Test Case Id	Selection Ref	Description	Page Nr
General/	Ver_Gen_Unass_Cell	CONT_CELL	Verify that if the IUT has a physical layer that has synchronous cell timeslots it generates and adds unassigned cells to the assigned cell stream to be transmitted, transforming a non−continuous cell stream of assigned cells into a continuous stream of assigned and unassigned cells.	69
Cell_Discrimination/VCI/	Ver_OAM_F4_Coding	VP_SERV	Verify that if the IUT supports VP level management, it has the capability to identify and encode OAM F4 flow cells with VCI=3 for a given VP.	70
Cell_Discrimination/PTI/	Ver_VP_UserData	VP_SERV	Verify that the IUT has the capability to pass user data cells on a VPC.	71
Cell_Discrimination/PTI/	Ver_VC_UserData	VC_SERV	Verify that the IUT has the capability to pass user data cells on a VCC.	72
Cell_Discrimination/PTI/	Ver_OAM_F5_Coding	VC_SERV	Verify that if the IUT supports VC levelmanagement, it uses the proper coding for segment OAM F5 flow cells with proper PTI code.	73
Cell_Discrimination/PTI/	Ign_OAM_Seg_F5	NO_VC_SERV	Verify that if the IUT does not support VC level management, it passes transparently (ignores) segment OAM F5 flow cells.	74
Cell_Discrimination/PTI/	Ign_OAM_End_F5	NO_VC_SERV	Verify that if the IUT does not support VC level management, it passes transparently (ignores) end−to−end OAM F5 flow cells.	75

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Test Group Reference	Test Case Id	Selection Ref	Description	Page Nr
M_plane/Information_Flows/	Pass_VP_End_F4	VP_SERV	Verify that if the IUT offers VP level service it is capable of transparently passing/carrying end−to−end OAM F4 cells.	76
M_plane/Information_Flows/	Pass_VP_End_F5	VP_SERV	Verify that if the IUT offers VP level service it is capable of transparently passing/carrying end−to−end OAM F5 cells	77
M_plane/Information_Flows/	Ver_VC_Only_F4	VC_SERV_ONLY	Verify that if the IUT supports the VC service only, it will either process or discard OAM F4 cells.	78
M_plane/OAM_Cell_Format/	Disc_Seg_F4	VP_SERV	Verify that the IUT does not foward valid segment OAM F4 cells at the end of a VP segment.	79
M_plane/OAM_Cell_Format/	Disc_Seg_F5	VC_SERV	Verify that the IUT does not forward valid segment OAM F5 cells at the end of a VC segment.	80
M_plane/OAM_Cell_Format/	Ign_F4_Inv_CRC	VP_SERV	Verify that the IUT ignores an OAM F4 cell with an invalid OAM CRC−10 Field.	81
M_plane/OAM_Cell_Format/	Ign_F5_Inv_CRC	VC_SERV	Verify that the IUT ignores an OAM F5 cell with an invalid OAM CRC−10 field.	82
M_plane/OAM_Cell_Format/	Ver_F4_LB_Res0	VP_SERV	Verify that the IUT sets all 7 reserved bits of the OAM F4 Loopback Indication field to ’0’B.	83
M_plane/OAM_Cell_Format/	Ver_F5_LB_Res0	VC_SERV	Verify that the IUT sets all 7 reserved bits of the OAM F5 Loopback Indication field to ’0’B.	84
M_plane/OAM_Cell_Format/	Disc_F4_LB_Res1	VP_SERV	Verify that the IUT discards an OAM F4 loopback cell with reserved bits not set to ’0’B.	85

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Test Group Reference	Test Case Id	Selection Ref	Description	Page Nr
M_plane/OAM_Cell_Format/	Disc_F5_LB_Res1	VC_SERV	Verify that the IUT discards an OAM F5 loopback cell with reserved bits not set to ’0’B.	86
M_plane/Fault_Management/Alarm_Surveilance/	Ver_VP_AIS_1	VP_SERV	Verify that the IUT, as a VP node, will send a VP−AIS to the downstream node when an upstream physical layer failure is detected.	87
M_plane/Fault_Management/Alarm_Surveilance/	Ver_VP_AIS_2	VP_HEC_AIS	Verify that the IUT, as a VP node, will send a VP−AIS to the downstream node when an upstream VPC failure is detected.	88
M_plane/Fault_Management/Alarm_Surveilance/	Ver_VP_FERF	VC_SERV_F4	Verify that the IUT, as an end point of a VP connection will send a VP−FERF in the upstream direction, after receiving a VP−AIS from the upstream direction.	89
M_plane/Fault_Management/Alarm_Surveilance/	Ver_VC_AIS_1	VC_ALARM	Verify that the IUT will send a VC−AIS to the downstream node when an upstream physical layer failure is detected if the current VCC is specified as being alarmed.	90
M_plane/Fault_Management/Alarm_Surveilance/	Ver_VC_AIS_2	VC_ALARM	Verify that the IUT will send a VC−AIS to the downstream node when an upstream VCC failure is detected.	91
M_plane/Fault_Management/Alarm_Surveilance/	Pass_VP_AIS	VP_SERV	Verify that the IUT, acting as a VP intermediate node, transparently passes VP−AIS cells.	92
M_plane/Fault_Management/Alarm_Surveilance/	Pass_VP_FERF	VP_SERV	Verify that the IUT, acting as a VP intermediate node, transparently passes all VP−FERF cells.	93

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Test Case Index

Test Group Reference	Test Case Id	Selection Ref	Description	Page Nr
M_plane/Fault_Management/Alarm_Surveilance/	Pass_VC_AIS	VC_SERV	Verify that the IUT transparently passes all VC−AIS cells.	94
M_plane/Fault_Management/Alarm_Surveilance/	Pass_VC_FERF	VC_SERV	Verify that the IUT transparently passes all VC−FERF cells.	95
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Ver_VP_End_F4_LB	VC_SERV_F4	Verify that if the IUT is an end point of a VPC and the Loopback Indication Field of received End−to−end OAM F4 loopback cell has ’1’B, it will loopback that OAM cell after decrement of the Loopback Indication Field of that cell of the received OAM cell.	96
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Ver_VP_End_F4_CT	VC_SERV_F4	Verify that if the IUT is an end point of a VPC, it will return an end−to−end OAM F4 loopback cell with the same correlation tag as the original message.	97
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Pass_VP_End_F4_LB	VP_SERV	Verify that if the IUT is an intermediate system in a VP Connection, it will pass an end−to−end OAM F4 loopback cell transparently.	98
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Pass_VP_End_F5_LB	VP_SERV	Verify that the IUT will pass an end−to−end OAM F5 loopback cell transparently in a VPC.	99
M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/	Pass_VC_End_F5_LB	VC_SERV	Verify that the IUT will pass an end−to−end OAM F5 loopback cell transparently in a VCC.	100

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Test Case Index

Test Group Reference	Test Case Id	Selection Ref	Description	Page Nr
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VP_Seg_F4	VP_SERV	Verify that if the IUT is an end point of a VP Segment at the UNI and the Loopback Indication Field of received Segment OAM F4 Loopback cell has '1'B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.	101
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VC_Seg_F5	VC_SERV	Verify that if the IUT is an end point of a VC Segment at the UNI and the Loopback Indication Field of received Segment OAM F5 Loopback cell has '1'B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.	102
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VP_Seg_F4_CT	VP_SERV	Verify that if the IUT supports VP service, it will return a Segment OAM F4 loopback cell with the same correlation tag as the original message.	103
M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/	Ver_VC_Seg_F5_CT	VC_SERV	Verify that if the IUT supports VC service, it will return a Segment OAM F5 loopback cell with the same correlation tag as the original message.	104

Detailed Comments :

II

Declarations Part

Test Suite Operation Definition

Operation Name : Valid_HEC(GFC_val,VPI_val,VCI_val,PTI_val,CLP_val:BITSTRING)
Result Type : OCTETSTRING
Comments :

Description

Valid_HEC calculates the proper value for the HEC field of a PDU based on the first four octets of the header and returns a valid HEC value.

Detailed Comments :

Test Suite Operation Definition

Operation Name : Invalid_HEC(GFC_val,VPI_val,VCI_val,PTI_val,CLP_val:BITSTRING)
Result Type : OCTETSTRING
Comments :

Description

This operation will generate and return a CRC error which reflects a 2−bit error, based on the first four octets of the header.

Detailed Comments :

Test Suite Operation Definition

Operation Name : Valid_CRC
Result Type : OCTETSTRING
Comments :

Description

Valid_CRC calculates the proper value for the CRC field of an OAM cell. The value used to compute a valid CRC is the text of the OAM cell of the PDU constraint from where this operation is called.

Detailed Comments :

Test Suite Operation Definition

Operation Name : Invalid_CRC
Result Type : OCTETSTRING
Comments :

Description

Invalid_CRC calculates the wrong value for the CRC field of an OAM cell. The value used to compute an invalid CRC is the text of the OAM cell of the constraint from where this operation is called.

Detailed Comments :

Test Suite Operation Definition

Operation Name : PadOctet(octet:BITSTRING; len:INTEGER)
Result Type : OCTETSTRING
Comments :

Description

This operation creates an octetstring by repeating a given "octet" pattern "len" times.

Detailed Comments :

Test Suite Operation Definition

Operation Name : IncBitString (bits:BITSTRING)
Result Type : BITSTRING
Comments :

Description

Increments the value of a BITSTRING by 1.

Detailed Comments :

Test Suite Operation Definition

Operation Name : IncOctetString (octets:OCTETSTRING)
Result Type : OCTETSTRING
Comments :

Description

This operation increments the value of an OCTETSTRING by 1.

Detailed Comments :

Test Suite Parameter Declarations			
Parameter Name	**Type**	**PICS/PIXIT Ref**	**Comments**
PHY_SYNCH	BOOLEAN	PIXIT 1	Does the physical interface used for testing require synchronous cell timeslot (e.g., SONET, DS3)?
VP_SERVpar	BOOLEAN	PICS 3.3.1	Does the IUT support VP service?
VC_SERVpar	BOOLEAN	PICS 3.3.2	Does the IUT support VC service?
VC_ALARMpar	BOOLEAN	PIXIT 5	Does the IUT support VC alarm signalling on the tested VCC?
VC_F4_SUPpar	BOOLEAN	PIXIT 6	Does the IUT support F4 flows while offering VC service only?
HEC_AISpar	BOOLEAN	PIXIT 4	Does the IUT generate a VP/VC−AIS after N consectutive HEC errors?
HEC_AISnum	INTEGER	PIXIT 4.1	Number of consecutive HEC errors needed for VP/VC−AIS (default 6)
NORESPtime	INTEGER	PIXIT 2	Enter the maximum time it can take for a cell to be forwarded by the IUT.
TESTtime	INTEGER	PIXIT 3	Enter a sufficient amount of time to complete each test.
TOPRtime	INTEGER		Enter a sufficient amount of time for test operator to initiate some test action. (recommend 180 seconds)
VPIvpca	BITSTRING	PIXIT 7.1	The VPI value for the VPC at PCO A
VPIvpcb	BITSTRING	PIXIT 7.2	The VPI value for the VPC at PCO B
VPIvcca	BITSTRING	PIXIT 9.1	The VPI value for the VCC at PCO A
VPIvccb	BITSTRING	PIXIT 9.2	The VPI value for the VCC at PCO B

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Test Suite Parameter Declarations			
Parameter Name	**Type**	**PICS/PIXIT Ref**	**Comments**
VCIvcca	BITSTRING	PIXIT 9.1	The VCI value for the VCC at PCO A
VCIvccb	BITSTRING	PIXIT 9.2	The VCI value for the VCC at PCO B
VPIvpcamin	BITSTRING	PIXIT 8.1	The minimum VPI value supported by the IUT on the incoming port.
VPIvpcbmin	BITSTRING	PIXIT 8.2	The minimum VPI value supported by the IUT on the outgoing port.
VPIvpcamax	BITSTRING	PIXIT 8.3	The maximum VPI value supported by the IUT on the incoming port.
VPIvpcbmax	BITSTRING	PIXIT 8.4	The maximum VPI value supported by the IUT on the outgoing port.
VCIvccamin	BITSTRING	PIXIT 10.1	The minimum non−reserved VCI value supported by the IUT on the incoming port.
VCIvccbmin	BITSTRING	PIXIT 10.2	The minimum non−reserved VCI value supported by the IUT on the outgoing port.
VCIvccamax	BITSTRING	PIXIT 10.3	The maximum non−reserved VCI value supported by the IUT on the incoming port.
VCIvccbmax	BITSTRING	PIXIT 10.4	The maximum non−reserved VCI value supported by the IUT on the outgoing port
Detailed Comments :			

Test Case Selection Expression Definitions		
Expression Name	**Selection Expression**	**Comments**
CONT_CELL	PHY_SYNCH	The physical layers for SONET, DS3, and 8B10B require a continuous stream of cells to be generated.
VP_SERV	VP_SERVpar	VP service
NO_VP_SERV	NOT(VP_SERVpar)	No VP service
VC_SERV	VC_SERVpar	VC service
NO_VC_SERV	NOT(VC_SERVpar)	No VC service
VC_SERV_ONLY	VC_SERVpar AND NOT(VP_SERVpar)	VC service only
VC_SERV_F4	(VC_SERVpar AND VP_SERVpar) OR (VC_SERVpar AND NOT(VP_SERVpar) AND VC_F4_SUPpar)	VC service only
VP_HEC_AIS	VP_SERVpar AND HEC_AISpar	VC service only
VC_ALARM	VC_SERVpar AND VC_ALARMpar	Supports VC alarm signalling
Detailed Comments :		

Test Suite Constant Declarations			
Constant Name	**Type**	**Value**	**Comments**
Start_VCI	BITSTRING	’0000000000100000’B	Start VCI=32. An arbitrarily chosen value.
Max_VCI	BITSTRING	’0000000000110000’B	End VCI=48. An arbitrarily chosen value.
Val_VCI	BITSTRING	’0000000000101000’B	Valid VCI=40. An arbitrarily chosen value.
Max_Number	OCTETSTRING	’0F’O	End counter value
SEG_OAM_F4	BITSTRING	’0000000000000011’B	VCI = 3
END_OAM_F4	BITSTRING	’0000000000000100’B	VCI = 4
Detailed Comments :			

Test Case Variable Declarations			
Variable Name	**Type**	**Value**	**Comments**
VCI_NR	BITSTRING		VCI counter value
GFC_VAL	BITSTRING		Value of the GFC field
PTI_VAL	BITSTRING		Value of the PTI field
Number	OCTETSTRING		Sequence number counter
COUNTER	INTEGER		Cell sequence counter
Detailed Comments :			

PCO Declarations			
PCO Name	**PCO Type**	**Role**	**Comments**
PCO_A	PHYSAP	LT	PHY Layer service access point on the first lower tester
PCO_B	PHYSAP	LT	PHY Layer service access point at the second lower tester
Detailed Comments : Two lower testers are being used to observe the IUT.			

Timer Declarations			
Timer Name	**Duration**	**Unit**	**Comments**
T_Test	TESTtime	sec	A sufficient amount of time to complete each test.
T_NoResp	NORESPtime	sec	A sufficient amount of time to guarantee no response from the IUT.
T_Opr	TOPRtime	sec	Time allowed for operator intervention.
T_LB	1	sec	Time within which the Loopback cell has to return
Detailed Comments :			

TTCN PDU Type Definition

PDU Name : CELL
PCO Type : PHYSAP
Comments :

Field Name	Field Type	Comments
GFC	BITSTRING[4]	Generic Flow Control
VPI	BITSTRING[8]	Virtual Path ID
VCI	BITSTRING[16]	Virtual Channel ID
PTI	BITSTRING[3]	Payload Type ID
CLP	BITSTRING[1]	Cell Loss Priority
HEC	OCTETSTRING[1]	Header Error Check
Payload	OCTETSTRING[48]	

Detailed Comments :

TTCN PDU Type Definition

PDU Name : CELL_NR
PCO Type : PHYSAP
Comments :

Field Name	Field Type	Comments
GFC	BITSTRING[4]	Generic Flow Control
VPI	BITSTRING[8]	Virtual Path ID
VCI	BITSTRING[16]	Virtual Channel ID
PTI	BITSTRING[3]	Payload Type ID
CLP	BITSTRING[1]	Cell Loss Priority
HEC	OCTETSTRING[1]	Header Error Check
Payload1	OCTETSTRING[1]	first payload, for the counter value
Payload2	OCTETSTRING[47]	second payload

Detailed Comments :

TTCN PDU Type Definition

PDU Name : OAM_LB
PCO Type : PHYSAP
Comments : Loopback Cell

Field Name	Field Type	Comments
GFC	BITSTRING[4]	Generic Flow Control
VPI	BITSTRING[8]	Virtual Path ID
VCI	BITSTRING[16]	Virtual Channel ID
PTI	BITSTRING[3]	Payload Type ID
CLP	BITSTRING[1]	Cell Loss Priority
HEC	OCTETSTRING[1]	Header Error Check
OAM_Cell_Type	BITSTRING[4]	
Function_Type	BITSTRING[4]	
Reserved	BITSTRING[7]	
Loopback_ID	BITSTRING[1]	
Correlation_Tag	OCTETSTRING[4]	
Loopback_Location	OCTETSTRING[12]	
Source_ID	OCTETSTRING[12]	
Unused	OCTETSTRING[16]	
CRC_10	OCTETSTRING[2]	

Detailed Comments :

TTCN PDU Type Definition

PDU Name : OAM_ER
PCO Type : PHYSAP
Comments : Error Cell

Field Name	Field Type	Comments
GFC	BITSTRING[4]	Generic Flow Control
VPI	BITSTRING[8]	Virtual Path ID
VCI	BITSTRING[16]	Virtual Channel ID
PTI	BITSTRING[3]	Payload Type ID
CLP	BITSTRING[1]	Cell Loss Priority
HEC	OCTETSTRING[1]	Header Error Check
OAM_Cell_Type	BITSTRING[4]	
Function_Type	BITSTRING[4]	
Failure_Type	OCTETSTRING[1]	
Failure_Location	OCTETSTRING[9]	
Unused	OCTETSTRING[35]	
CRC_10	OCTETSTRING[2]	

Detailed Comments :

III

Constraints Part

TTCN PDU Constraint Declaration

Constraint Name : CELL_UNASSIGNED
PDU Type : CELL
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	’00000000’B	
VCI	’0000000000000000’B	
PTI	?	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,’00000000’B,’0000 000000000000’B,CELL.PTI,’0’B)	
Payload	?	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : CELL_HEC_ER(VPI_val,VCI_val:BITSTRING)
PDU Type : CELL
Derivation Path :
Comments : Cell with an invalid Header Error Check

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’000’B	
CLP	’0’B	
HEC	Invalid_HEC(’0000’B,VPI_val,VCI_val,’ 000’B,’0’B)	
Payload	PadOctet(’00’O,48)	

Detailed Comments : Cells with an invalid HEC are used for the simulation of the loss of cell delineation.

TTCN PDU Constraint Declaration

Constraint Name : CELL_SQ(VPI_val,VCI_val:BITSTRING;N:OCTETSTRING)
PDU Type : CELL_NR
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’000’B,’0’B)	
Payload1	N	
Payload2	PadOctet(’00’O,47)	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : CELL_GFC(VPI_val,VCI_val,GFC_VALUE:BITSTRING)
PDU Type : CELL
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	GFC_VALUE	
VPI	VPI_val	
VCI	VCI_val	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(GFC_VALUE,VPI_val,VCI_val,’000’B,’0’B)	
Payload	PadOctet(’00’O,48)	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : CELL_PTI(VPI_val,VCI_val, PTI_val:BITSTRING)
PDU Type : CELL
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	PTI_val	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,PTI_val,’0’B)	
Payload	PadOctet(’00’O,48)	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : CELL_USER_PTI(VPI_val,VCI_val:BITSTRING)
PDU Type : CELL
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’0??’B	
CLP	?	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,CELL.PTI,CELL.CLP)	
Payload	PadOctet(’00’O,48)	

Detailed Comments : Receive user cell with any congestion or SDU type.

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_LB0(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Reception Loopback F4

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_LB1(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’01’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Valid_CRC	

Detailed Comments : Send Loopback segment F4

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_LB1_RES1(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’1111111’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’01’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Valid_CRC	

Detailed Comments : Send Loopback segment F4 with non−zero reserved bits

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_RES0(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	Verify this field
Loopback_ID	?	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Check seven unused bits in the loopback ID

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_CT(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	?	
Correlation_Tag	PadOctet(’01’O,4)	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Check correlation Tag

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_LB0(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Receive End_to_End loopback F4

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_LB1(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’02’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Valid_CRC	

Detailed Comments : Send End_to_End F4 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F4_CT(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’0?0’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,OAM_LB.PTI,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	?	
Correlation_Tag	PadOctet(’02’O,4)	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Check End_to_End F4 loopback Correlation Tag

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_LB0(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Reception segment F5 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_LB1(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’03’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Valid_CRC	

Detailed Comments : Send segment F5 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_LB1_RES1(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’1111111’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’03’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Valid_CRC	

Detailed Comments : Send segment F5 loopback cell with non−zero reserved bits

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_RES0(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	Verify this field
Loopback_ID	?	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Check the seven unused bits in the loopback ID.

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_CT(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	?	
Correlation_Tag	PadOctet(’03’O,4)	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Check segment F5 loopback correlation tag field

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_LB0(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’?’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,OAM_LB.CLP)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	?	
Loopback_ID	’0’B	
Correlation_Tag	?	
Loopback_Location	?	
Source_ID	?	
Unused	?	
CRC_10	Valid_CRC	

Detailed Comments : Reception End_to_End F5 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_END_F5_LB1(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’04’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Valid_CRC	

Detailed Comments : Send End_to_End F5 loopback cell

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F4_INV_CRC(VPI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	SEG_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,SEG_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’00’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Invalid_CRC	

Detailed Comments : Invalid CRC Field

TTCN PDU Constraint Declaration

Constraint Name : OAM_SEG_F5_INV_CRC(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_LB
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’100’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’100’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’1000’B	
Reserved	’0000000’B	
Loopback_ID	’1’B	
Correlation_Tag	PadOctet(’00’O,4)	
Loopback_Location	PadOctet(’FF’O,12)	
Source_ID	PadOctet(’FF’O,12)	
Unused	PadOctet(’6A’O,16)	
CRC_10	Invalid_CRC	

Detailed Comments : Invalid CRC

TTCN PDU Constraint Declaration

Constraint Name : OAM_VP_AIS(VPI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’0000’B	
Failure_Type	’6A’O	
Failure_Location	PadOctet(’6A’O,9)	
Unused	PadOctet(’6A’O,35)	
CRC_10	Valid_CRC	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : OAM_VP_FERF(VPI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	END_OAM_F4	
PTI	’000’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,END_OAM_F4,’000’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’0001’B	
Failure_Type	’6A’O	
Failure_Location	PadOctet(’6A’O,9)	
Unused	PadOctet(’6A’O,35)	
CRC_10	Valid_CRC	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : OAM_VC_AIS(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’0000’B	
Failure_Type	’6A’O	
Failure_Location	PadOctet(’6A’O,9)	
Unused	PadOctet(’6A’O,35)	
CRC_10	Valid_CRC	

Detailed Comments :

TTCN PDU Constraint Declaration

Constraint Name : OAM_VC_FERF(VPI_val,VCI_val:BITSTRING)
PDU Type : OAM_ER
Derivation Path :
Comments :

Field Name	Field Value	Comments
GFC	’0000’B	
VPI	VPI_val	
VCI	VCI_val	
PTI	’101’B	
CLP	’0’B	
HEC	Valid_HEC(’0000’B,VPI_val,VCI_val,’101’B,’0’B)	
OAM_Cell_Type	’0001’B	
Function_Type	’0001’B	
Failure_Type	’6A’O	
Failure_Location	PadOctet(’6A’O,9)	
Unused	PadOctet(’6A’O,35)	
CRC_10	Valid_CRC	

Detailed Comments :

IV

Dynamic Part

Test Case Dynamic Behaviour

Test Case Name : Ver_VP
Group : General/
Purpose : Verify that the IUT supports point−to−point VP connectivity.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.1, 1.5/PICS 3.3.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!CELL_NR	CELL_SQ(VPIvpca,Val_VCI,'01'O)		
2		START T_Test			
3	LB1	PCO_B?CELL_NR	CELL_SQ(VPIvpcb,Val_VCI,'01'O)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC
Group : General/
Purpose : Verify that the IUT supports point−to−point VC connectivity.

Configuration :
Default :
Comments : Requires a VC connection Ref. 3.1,1.5/PICS 3.3.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!CELL_NR	CELL_SQ(VPIvcca,VCIvcca,'01'O)		
2		START T_Test			
3	LB1	PCO_B?CELL_NR	CELL_SQ(VPIvccb,VCIvccb,'01'O)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_Min
Group : General/
Purpose : Verify that the IUT relays cells on a VP connection for the minimum VPI value supported by the IUT.

Configuration :
Default :
Comments : Requires a VP Connection. Ref. 3.3,1.5/PICS 3.3.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!CELL_NR	CELL_SQ(VPIvpcamin,Val_VCI,'01'O)		
2		START T_Test			
3	LB1	PCO_B?CELL_NR	CELL_SQ(VPIvpcbmin,Val_VCI,'01'O)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments :
Selection Ref: VP_SERV. Configure the IUT to switch from VPIvpcamin on the incoming port, to VPIvpcbmin on the outgoing port. Test operator must make sure that the minimum VPI value on the incoming port maps to the minimum VPI value on the outgoing port.

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_Max
Group : General/
Purpose : Verify that the IUT relays cells on a VP connection for the maximum VPI value supported by the IUT.

Configuration :
Default :
Comments : Requires a VP Connection. Ref. 3.3,1.5/PICS 3.3.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!CELL_NR	CELL_SQ(VPIvpcamax,Val_VCI,'01'O)		
2		START T_Test			
3	LB1	PCO_B?CELL_NR	CELL_SQ(VPIvpcbmax,Val_VCI,'01'O)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments :
Selection Ref: VP_SERV. Configure the IUT to switch from VPIvpcamax on the incoming port, to VPIvpcbmax on the outgoing port. Test operator must make sure that the maximum VPI value on the incoming port maps to the maximum VPI value on the outgoing port.

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_Min

Group : General/

Purpose : Verify that the IUT relays cells on a VC connection for the minimum non−reserved VCI value supported by the IUT.

Configuration :

Default :

Comments : Requires a VC Connection. Ref. 3.3, 1.5/PICS 3.3.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!CELL_NR	CELL_SQ(VPIvcca,VCIvccamin,'01'O)		
2		START T_Test			
3	LB1	PCO_B?CELL_NR	CELL_SQ(VPIvccb,VCIvccbmin,'01'O)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments :

Selection Ref: VC_SERV. Configure the IUT to switch from VPIvpcamin on the incoming port, to VPIvpcbmin on the outgoing port. Test operator must make sure that the minimum VCI value of the incoming port maps to the minimum VCI value of the outgoing port.

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_Max

Group : General/

Purpose : Verify that the IUT relays cells on a VC connection for the maximum non−reserved VCI value supported by the IUT.

Configuration :

Default :

Comments : Requires a VC Connection. Ref. 3.3, 1.5/PICS 3.3.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!CELL_NR	CELL_SQ(VPIvcca,VCIvccamax,'01'O)		
2		START T_Test			
3	LB1	PCO_B?CELL_NR	CELL_SQ(VPIvccb,VCIvccbmax,'01'O)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments :

Selection Ref: VC_SERV. Configure the IUT to switch from VPIvccamax on the incoming port, to VPIvccbmax on the outgoing port. Test operator must make sure that the maximum VCI value on the incoming port maps to the maximum VCI value on the outgoing port.

Test Case Dynamic Behaviour

Test Case Name : Ver_Cell_Seq_VP

Group : General/

Purpose : Verify that the IUT relays cells for a given VP and forwards all VCIs while preserving cell sequence integrity.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.1/PICS 3.3.8

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		(VCI_NR:= Start_VCI)			
2	LB1	PCO_A!CELL_NR	CELL_SQ(VPIvpca,VCI_NR, ’01’O)		
3		[VCI_NR < Max_VCI]			
4		(VCI_NR:= IncBitString(VCI_NR))			
5		GOTO LB1			
6		[VCI_NR >= Max_VCI]			
7		START T_Test			
8		(VCI_NR:= Start_VCI)			
9	LB2	PCO_B?CELL_NR	CELL_SQ(VPIvpcb,VCI_NR, ’01’O)		
10		[VCI_NR < Max_VCI]			
11		(VCI_NR:= IncBitString(VCI_NR))			
12		GOTO LB2			
13		[VCI_NR >= Max_VCI]		P	
14		PCO_B?CELL	CELL_UNASSIGNED		
15		GOTO LB2			
16		?TIMEOUT T_Test		F	
17		PCO_B?OTHERWISE		F	

Detailed Comments :

Selection Ref: VP_SERV; Only applicable to an IUT which supports VP service. Only applicable to an IUT which assigns VPI values sequentially when setting up a new connection. The number of VCIs used is chosen arbitrarily and set to 16.

Test Case Dynamic Behaviour

Test Case Name : Ver_Cell_Seq_VC
Group : General/
Purpose : Verify that the IUT relays cells for a given VC while preserving cell sequence integrity.

Configuration :
Default :
Comments : Requires a VC connection Ref. 3.1/PICS 3.3.8

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		(Number:=’00’O)			
2	LB1	PCO_A!CELL_NR	CELL_SQ(VPIvcca,VCIvcca, Number)		
3		[Number < Max_Number]			
4		(Number:= IncOctetString(Number))			
5		GOTO LB1			
6		[Number >= Max_Number]			
7		START T_Test			
8		(Number:= ’00’O)			
9	LB2	PCO_B?CELL_NR	CELL_SQ(VPIvccb,VCIvccb, Number)		
10		[Number < Max_Number]			
11		(Number:= IncOctetString(Number))			
12		GOTO LB2			
13		[Number >= Max_Number]		P	
14		PCO_B?CELL	CELL_UNASSIGNED		
15		GOTO LB2			
16		?TIMEOUT T_Test		F	
17		PCO_B?OTHERWISE		F	

Detailed Comments :
Selection Ref: VC_SERV; This test is only applicable to IUTs which support VC service. The number of cells sent is chosen arbitrarily and set to 16.

Test Case Dynamic Behaviour

Test Case Name : Ver_GFC0_VP
Group : General/
Purpose : Verify that when the IUT receives non−zero GFC, it will encode all GFC bits to '0' in a VPC.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.3/PICS 3.5.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		(GFC_VAL:='0000'B)			
2	LB1	PCO_A!CELL	CELL_GFC(VPIvpca,Val_VCI,GFC_VAL)		
3		[GFC_VAL<>'1111'B]			
4		(GFC_VAL:= IncBitString(GFC_VAL))			
5		GOTO LB1			
6		[GFC_VAL='1111'B]			
7		START T_Test			
8		(COUNTER:=0)			
9	LB2	PCO_B?CELL	CELL_GFC(VPIvpcb,Val_VCI,'0000'B)		Are all GFC bits set to 0?
10		(COUNTER:=COUNTER+1)			
11		[COUNTER<16]			
12		GOTO LB2			
13		[COUNTER=16]		P	
14		PCO_B?CELL	CELL_UNASSIGNED		
15		GOTO LB2			
16		?TIMEOUT T_Test		F	
17		PCO_B?OTHERWISE		F	

Detailed Comments :
Selection Ref: VP_SERV; This test verifies that all combinations possible in the GFC field will be set to '0000'B. For the VP connection, the VCIs will be the same, and are arbitrarily set to the value of the 'Val_VCI'.

Test Case Dynamic Behaviour

Test Case Name : Ver_GFC0_VC
Group : General/
Purpose : Verify that when the IUT receives non−zero GFC, it will encode all GFC bits to ’0’ in a VCC.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.3/PICS 3.5.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		(GFC_VAL:=’0000’B)			
2	LB1	PCO_A!CELL	CELL_GFC(VPIvcca,VCIvcca,GFC_VAL)		
3		[GFC_VAL<>’1111’B]			
4		(GFC_VAL:= IncBitString(GFC_VAL))			
5		GOTO LB1			
6		[GFC_VAL=’1111’B]			
7		START T_Test			
8		(COUNTER:=0)			
9	LB2	PCO_B?CELL	CELL_GFC(VPIvccb,VCIvccb,’0000’B)		Are all GFC bits set to 0?
10		(COUNTER:=COUNTER+1)			
11		[COUNTER<16]			
12		GOTO LB2			
13		[COUNTER=16]		P	
14		PCO_B?CELL	CELL_UNASSIGNED		
15		GOTO LB2			
16		?TIMEOUT T_Test		F	
17		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV; This test verifies that all combinations possible in the GFC field will be set to ’0000’B.

Test Case Dynamic Behaviour

Test Case Name : Ver_Gen_Unass_Cell

Group : General/

Purpose :

Verify that if the IUT has a physical layer that has synchronous cell timeslots it generates and adds unassigned cells to the assigned cell stream to be transmitted, transforming a non−continuous cell stream of assigned cells into a continuous stream of assigned and unassigned cells.

Configuration :

Default :

Comments : Ref. 3.4.2/PICS 3.10.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		START T_Test			
2		PCO_B?CELL	CELL_UNASSIGNED	P	
3		?TIMEOUT T_Test		F	
4		PCO_B?OTHERWISE		F	

Detailed Comments :

Selection Ref: CONT_CELL. PHY layer requires a continuous stream of unassigned cells to be generated. The timing requirement in this case is not to check on the absolute rate, but just to restrict the time of the test case.

Test Case Dynamic Behaviour

Test Case Name : Ver_OAM_F4_Coding

Group : Cell_Discrimination/VCI/

Purpose :
Verify that if the IUT supports VP level management, it has the capability to identify and encode OAM F4 flow cells with VCI=3 for a given VP.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.4.3, 3.5.2/PICS 3.15.5

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_LB1(VPIvpca)		
2		START T_Test			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F4_LB0(VPIvpca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_A?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_UserData
Group : Cell_Discrimination/PTI/
Purpose : Verify that the IUT has the capability to pass user data cells on a VPC.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.4.4, 3.1/PICS 3.6.3, 3.3.8

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		(PTI_VAL:=’000’B)			
2	LB1	PCO_A!CELL	CELL_PTI(VPIvpca,Val_VCI, PTI_VAL)		
3		[PTI_VAL<>’011’B]			
4		(PTI_VAL:=IncBitString(PTI_VAL))			
5		GOTO LB1			
6		[PTI_VAL=’011’B]			
7		START T_Test			
8		(COUNTER:=0)			
9	LB2	PCO_B?CELL	CELL_USER_PTI(VPIvpcb,Val_VCI)		
10		(COUNTER:=COUNTER+1)			
11		[COUNTER<4]			
12		GOTO LB2			
13		[COUNTER=4]		P	
14		PCO_B?CELL	CELL_UNASSIGNED		
15		GOTO LB1			
16		?TIMEOUT T_Test		F	
17		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_UserData
Group : Cell_Discrimination/PTI/
Purpose : Verify that the IUT has the capability to pass user data cells on a VCC.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.4.4, 3.1/PICS 3.6.3, 3.3.8

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		(PTI_VAL:='000'B)			
2	LB1	PCO_A!CELL	CELL_PTI(VPIvcca,VCIvcca, PTI_VAL)		
3		[PTI_VAL<>'011'B]			
4		(PTI_VAL:=IncBitString(PTI_VAL))			
5		GOTO LB1			
6		[PTI_VAL='011'B]			
7		START T_Test			
8		(COUNTER:=0)			
9	LB2	PCO_B?CELL	CELL_USER_PTI(VPIvccb,VCIvccb)		
10		(COUNTER:=COUNTER+1)			
11		[COUNTER<4]			
12		GOTO LB2			
13		[COUNTER=4]		P	
14		PCO_B?CELL	CELL_UNASSIGNED		
15		GOTO LB1			
16		?TIMEOUT T_Test		F	
17		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_OAM_F5_Coding

Group : Cell_Discrimination/PTI/

Purpose :
Verify that if the IUT supports VC level management, it uses the proper coding for segment OAM F5 flow cells with proper PTI code.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.4.4, 3.5.2/PICS 3.15.5

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_Test			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F5_LB0(VPIvcca ,VCIvcca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_A?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ign_OAM_Seg_F5

Group : Cell_Discrimination/PTI/

Purpose : Verify that if the IUT does not support VC level management, it passes transparently (ignores) segment OAM F5 flow cells.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.4.4, 3.5.1/PICS 3.6.7

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_Test			
3	LB1	PCO_B?OAM_LB	OAM_SEG_F5_LB1(VPIvccb ,VCIvccb)	P	Pass the OAM cell transparently
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_A?OTHERWISE		F	The IUT should not return anything
8		PCO_B?OTHERWISE		F	The IUT should not send anything

Detailed Comments : Selection Ref: NO_VC_SERV. In this case "ignore" is interpreted as "pass transparently.

Test Case Dynamic Behaviour

Test Case Name : Ign_OAM_End_F5

Group : Cell_Discrimination/PTI/

Purpose : Verify that if the IUT does not support VC level management, it passes transparently (ignores) end−to−end OAM F5 flow cells.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.4.4, 3.5.1/PICS 3.6.9

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_Test			
3	LB1	PCO_B?OAM_LB	OAM_END_F5_LB1(VPIvccb,VCIvccb)	P	Pass the OAM cell transparently
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_A?OTHERWISE		F	The IUT should not return anything
8		PCO_B?OTHERWISE		F	The IUT should not send anything

Detailed Comments : Selection Ref: NO_VC_SERV. In this case "ignore" is interpreted as "pass transparently.

Test Case Dynamic Behaviour

Test Case Name : Pass_VP_End_F4

Group : M_plane/Information_Flows/

Purpose : Verify that if the IUT offers VP level service it is capable of transparently passing/carrying end−to−end OAM F4 cells.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.5.1/PICS 3.15.3

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F4_LB1(VPIvpc a)		
2		START T_Test			
3	LB1	PCO_B?OAM_LB	OAM_END_F4_LB1(VPIvpc b)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Pass_VP_End_F5

Group : M_plane/Information_Flows/

Purpose : Verify that if the IUT offers VP level service it is capable of transparently passing/carrying end−to−end OAM F5 cells

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.5.1/PICS 3.15.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_Test			
3	LB1	PCO_B?OAM_LB	OAM_END_F5_LB1(VPIvccb,VCIvccb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_Only_F4
Group : M_plane/Information_Flows/
Purpose : Verify that if the IUT supports the VC service only, it will either process or discard OAM F4 cells.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.1/PICS 3.15.3

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_LB1(VPIvcca)		
2		[VC_F4_SUPpar]			
3		START T_Test			
4	LB1	PCO_A?OAM_LB	OAM_SEG_F4_LB0(VPIvcca)	P	
5		PCO_A?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		?TIMEOUT T_Test		F	
8		PCO_A?OTHERWISE		F	
9		[NOT(VC_F4_SUPpar)]			
10		START T_NoResp			
11	LB2	PCO_A?CELL	CELL_UNASSIGNED		
12		GOTO LB2			
13		?TIMEOUT T_NoResp		P	
14		PCO_A?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV_ONLY

Test Case Dynamic Behaviour

Test Case Name : Disc_Seg_F4
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT does not foward valid segment OAM F4 cells at the end of a VP segment.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.5.3.2/PICS 3.17.1, 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_LB1(VPIvpca)		
2		START T_NoResp			
3	LB1	PCO_B?OAM_LB	OAM_SEG_F4_LB1(VPIvpcb)	F	
4		?TIMEOUT T_NoResp		P	
5		PCO_B?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref.: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_Seg_F5
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT does not forward valid segment OAM F5 cells at the end of a VC segment.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.3.2/PICS 3.17.1, 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_NoResp			
3	LB1	PCO_B?OAM_LB	OAM_SEG_F5_LB1(VPIvccb ,VCIvccb)	F	
4		?TIMEOUT T_NoResp		P	
5		PCO_B?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ign_F4_Inv_CRC
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT ignores an OAM F4 cell with an invalid OAM CRC−10 Field.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_INV_CRC(VPIvpca)		
2		START T_NoResp			
3	LB1	PCO_B?OAM_LB	OAM_SEG_F4_INV_CRC(VPIvpcb)	F	
4		?TIMEOUT T_NoResp		P	
5		PCO_B?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref.: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ign_F5_Inv_CRC
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT ignores an OAM F5 cell with an invalid OAM CRC−10 field.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.15.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_INV_CRC(VPIvcca,VCIvcca)		
2		START T_NoResp			
3	LB1	PCO_B?OAM_LB	OAM_SEG_F5_INV_CRC(VPIvccb,VCIvccb)	F	
4		?TIMEOUT T_NoResp		P	
5		PCO_B?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_F4_LB_Res0
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT sets all 7 reserved bits of the OAM F4 Loopback Indication field to '0'B.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.17.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_LB1(VPIvpca)		
2		START T_Test			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F4_RES0(VPIvpca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_F5_LB_Res0
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT sets all 7 reserved bits of the OAM F5 Loopback Indication field to '0'B.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.17.6

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_Test			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F5_RES0(VPIvc ca,VCIvcca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_F4_LB_Res1
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F4 loopback cell with reserved bits not set to ’0’B.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.5.2, 3.5.3.2/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_LB1_RES1(VPIvpca)		
2		START T_NoResp			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F4_LB0(VPIvpca)	F	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_NoResp		P	
7		PCO_A?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Disc_F5_LB_Res1
Group : M_plane/OAM_Cell_Format/
Purpose : Verify that the IUT discards an OAM F5 loopback cell with reserved bits not set to ’0’B.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.2, 3.5.3.2/PICS 3.17.2

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_LB1_RES1(VPIvcca,VCIvcca)		
2		START T_NoResp			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F5_LB0(VPIvcca ,VCIvcca)	F	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_NoResp		P	
7		PCO_A?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_AIS_1

Group : M_plane/Fault_Management/Alarm_Surveilance/

Purpose :
Verify that the IUT, as a VP node, will send a VP−AIS to the downstream node when an upstream physical layer failure is detected.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.5.3.1/PICS 3.16.5

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!OAM_ER>	OAM_VP_AIS(VPIvpcb)		
2		START T_Opr			
3	LB1	PCO_B?OAM_ER	OAM_VP_AIS(VPIvpcb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Opr		I	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV; Make the IUT send an OAM VP−AIS by causing a physical layer failure between the IUT and the PCO_A.

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_AIS_2

Group : M_plane/Fault_Management/Alarm_Surveilance/

Purpose : Verify that the IUT, as a VP node, will send a VP−AIS to the downstream node when an upstream VPC failure is detected.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.5.3.1/PICS 3.16.3

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		(COUNTER:=0)			
2		REPEAT SEND_HEC_ERR UNTIL [COUNTER=HEC_AISnum]			
3		START T_Test			
4	LB1	PCO_B?OAM_ER	OAM_VP_AIS(VPIvpcb)	P	
5		PCO_B?CELL	CELL_UNASSIGNED		
6		GOTO LB1			
7		?TIMEOUT T_Test		F	
8		PCO_B?OTHERWISE		F	
		SEND_HEC_ERR			
9		PCO_A!CELL	CELL_HEC_ER(VPIvpca,Val_VCI)		
10		(COUNTER:=COUNTER+1)			

Detailed Comments :

Selection Ref: VP_HEC_AIS; A VPC error is forced by sending N cells with a HEC error, which will result in loss of cell delineation, which causes a VPC error. This may not be realizable by all test systems.

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_FERF

Group : M_plane/Fault_Management/Alarm_Surveilance/

Purpose :
Verify that the IUT, as an end point of a VP connection will send a VP−FERF in the upstream direction, after receiving a VP−AIS from the upstream direction.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.5.3.1/PICS 3.16.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_ER	OAM_VP_AIS(VPIvcca)		
2		START T_Test			
3	LB1	PCO_A?OAM_ER	OAM_VP_FERF(VPIvcca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_A?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV_F4

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_AIS_1

Group : M_plane/Fault_Management/Alarm_Surveilance/

Purpose :
Verify that the IUT will send a VC−AIS to the downstream node when an upstream physical layer failure is detected if the current VCC is specified as being alarmed.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.5.3.1/PICS 3.16.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		<IUT!OAM_ER>	OAM_VC_AIS(VPIvccb,VCIvccb)		
2		START T_Opr			
3	LB1	PCO_B?OAM_ER	OAM_VC_AIS(VPIvccb,VCIvccb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Opr		I	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_ALARM; Make the IUT send an OAM VC−AIS by causing a physical layer failure between the IUT and PCO_A.

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_AIS_2

Group : M_plane/Fault_Management/Alarm_Surveilance/

Purpose : Verify that the IUT will send a VC−AIS to the downstream node when an upstream VCC failure is detected.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.5.3.1/PICS 3.16.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_ER	OAM_VP_AIS(VPIvcca)		
2		START T_Test			
3	LB1	PCO_B?OAM_ER	OAM_VC_AIS(VPIvccb,VCIvccb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_ALARM; Sending a VP−AIS to a VC switch will result in a VCC failure. The IUT has to generate a VC−AIS.

Test Case Dynamic Behaviour

Test Case Name : Pass_VP_AIS
Group : M_plane/Fault_Management/Alarm_Surveilance/
Purpose : Verify that the IUT, acting as a VP intermediate node, transparently passes VP−AIS cells.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_ER	OAM_VP_AIS(VPIvpca)		
2		START T_Test			
3	LB1	PCO_B?OAM_ER	OAM_VP_AIS(VPIvpcb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Pass_VP_FERF
Group : M_plane/Fault_Management/Alarm_Surveilance/
Purpose : Verify that the IUT, acting as a VP intermediate node, transparently passes all VP−FERF cells.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_ER	OAM_VP_FERF(VPIvpca)		
2		START T_Test			
3	LB1	PCO_B?OAM_ER	OAM_VP_FERF(VPIvpcb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Pass_VC_AIS
Group : M_plane/Fault_Management/Alarm_Surveilance/
Purpose : Verify that the IUT transparently passes all VC−AIS cells.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.15.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_ER	OAM_VC_AIS(VPIvcca,VCIvcca)		
2		START T_Test			
3	LB1	PCO_B?OAM_ER	OAM_VC_AIS(VPIvccb,VCIvccb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Pass_VC_FERF
Group : M_plane/Fault_Management/Alarm_Surveilance/
Purpose : Verify that the IUT transparently passes all VC−FERF cells.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.15.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_ER	OAM_VC_FERF(VPIvcca,VCIvcca)		
2		START T_Test			
3	LB1	PCO_B?OAM_ER	OAM_VC_FERF(VPIvccb,VCIvccb)	P	
4		PCO_B?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_End_F4_LB

Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/

Purpose :
Verify that if the IUT is an end point of a VPC and the Loopback Indication Field of received End−to−end OAM F4 loopback cell has ’1’B, it will loopback that OAM cell after decrement of the Loopback Indication Field of that cell of the received OAM cell.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.5.3.2/PICS 3.17.3, 3.17.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F4_LB1(VPIvcca)		
2		START T_LB			
3	LB1	PCO_A?OAM_LB	OAM_END_F4_LB0(VPIvcca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_LB		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV_F4

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_End_F4_CT

Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/

Purpose :
Verify that if the IUT is an end point of a VPC, it will return an end−to−end OAM F4 loopback cell with the same correlation tag as the original message.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.5.3.2/PICS 3.15.11, 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F4_LB1(VPIvcca)		
2		START T_Test			
3	LB1	PCO_A?OAM_LB	OAM_END_F4_CT(VPIvcca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV_F4

Test Case Dynamic Behaviour

Test Case Name : Pass_VP_End_F4_LB

Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/

Purpose :
Verify that if the IUT is an intermediate system in a VP Connection, it will pass an end−to−end OAM F4 loopback cell transparently.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F4_LB1(VPIvpc a)		
2		START T_Test			
3	LB1	PCO_B?OAM_LB	OAM_END_F4_LB1(VPIvpc b)		
4		START T_NoResp			
5	LB2	PCO_A?OAM_LB	OAM_END_F4_LB0(VPIvpc a)	F	
6		PCO_B?CELL	CELL_UNASSIGNED		
7		GOTO LB2			
8		?TIMEOUT T_NoResp		P	
9		PCO_B?CELL	CELL_UNASSIGNED		
10		GOTO LB1			
11		?TIMEOUT T_Test		F	
12		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Pass_VP_End_F5_LB
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose : Verify that the IUT will pass an end−to−end OAM F5 loopback cell transparently in a VPC.

Configuration :
Default :
Comments : Requires a VP connection. Ref. 3.5.2/PICS 3.15.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F5_LB1(VPIvpca,Val_VCI)		
2		START T_Test			
3	LB1	PCO_B?OAM_LB	OAM_END_F5_LB1(VPIvpcb,Val_VCI)		
4		START T_NoResp			
5	LB2	PCO_A?OAM_LB	OAM_END_F5_LB0(VPIvpca,Val_VCI)	F	
6		PCO_B?CELL	CELL_UNASSIGNED		
7		GOTO LB2			
8		?TIMEOUT T_NoResp		P	
9		PCO_B?CELL	CELL_UNASSIGNED		
10		GOTO LB1			
11		?TIMEOUT T_Test		F	
12		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Pass_VC_End_F5_LB
Group : M_plane/Fault_Management/Connectivity_Verification/End_to_End_Loopback/
Purpose : Verify that the IUT will pass an end−to−end OAM F5 loopback cell transparently in a VCC.

Configuration :
Default :
Comments : Requires a VC connection. Ref. 3.5.2/PICS 3.15.10

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_END_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_Test			
3	LB1	PCO_B?OAM_LB	OAM_END_F5_LB1(VPIvccb,VCIvccb)		
4		START T_NoResp			
5	LB2	PCO_A?OAM_LB	OAM_END_F5_LB0(VPIvcca ,VCIvcca)	F	
6		PCO_B?CELL	CELL_UNASSIGNED		
7		GOTO LB2			
8		?TIMEOUT T_NoResp		P	
9		PCO_B?CELL	CELL_UNASSIGNED		
10		GOTO LB1			
11		?TIMEOUT T_Test		F	
12		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_Seg_F4

Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/

Purpose :
Verify that if the IUT is an end point of a VP Segment at the UNI and the Loopback Indication Field of received Segment OAM F4 Loopback cell has '1'B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.5.3.2.2/PICS 3.17.3, 3.17.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_LB1(VPIvpca)		
2		START T_LB			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F4_LB0(VPIvpca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_LB		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref.: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_Seg_F5

Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/

Purpose :
Verify that if the IUT is an end point of a VC Segment at the UNI and the Loopback Indication Field of received Segment OAM F5 Loopback cell has '1'B, it will loop back that OAM cell after decrement of the Loopback Indication Field of that cell.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.5.3.2.2/PICS 3.17.3, 3.17.4

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_LB			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F5_LB0(VPIvcca ,VCIvcca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_LB		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VC_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VP_Seg_F4_CT

Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/

Purpose :
Verify that if the IUT supports VP service, it will return a Segment OAM F4 loopback cell with the same correlation tag as the original message.

Configuration :

Default :

Comments : Requires a VP connection. Ref. 3.5.3.2.2/PICS 3.15.11, 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F4_LB1(VPIvpca)		
2		START T_Test			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F4_CT(VPIvpca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref: VP_SERV

Test Case Dynamic Behaviour

Test Case Name : Ver_VC_Seg_F5_CT

Group : M_plane/Fault_Management/Connectivity_Verification/UNI_Loopback/

Purpose :
Verify that if the IUT supports VC service, it will return a Segment OAM F5 loopback cell with the same correlation tag as the original message.

Configuration :

Default :

Comments : Requires a VC connection. Ref. 3.5.3.2.2/PICS 3.15.11, 3.17.1

Nr	Label	Behaviour Description	Constraints Ref	Verdict	Comments
1		PCO_A!OAM_LB	OAM_SEG_F5_LB1(VPIvcca ,VCIvcca)		
2		START T_Test			
3	LB1	PCO_A?OAM_LB	OAM_SEG_F5_CT(VPIvcca, VCIvcca)	P	
4		PCO_A?CELL	CELL_UNASSIGNED		
5		GOTO LB1			
6		?TIMEOUT T_Test		F	
7		PCO_B?OTHERWISE		F	

Detailed Comments : Selection Ref.: VC_SERV