Bridge Functions Consortium

Virtual Local Area Network (VLAN)
Interoperability Test Suite
Version 2.2

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MODIFICATION RECORD

Version	Date	Editor(s)	Comments
2.0	2004-07-20	Brandon Barry Curtis Simonson	Complete revision of test suite. Resource requirements have increased, but configuration time has decreased as a result. The tests, based on IEEE Std. 802.1Q-2003, are more rigorous. The suite does not contain tests for protocol based VLAN classification, but this will be added if there is sufficient interest.
2.1	2004-11-29	Corey Hill Curtis Simonson	Fixed typographical and miscellaneous errors. Updated test results.
2.2	2005-01-20	Tyler Marcotte	Format Modification

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Brandon Barry	UNH InterOperability Laboratory
Corey Hill	UNH InterOperability Laboratory
Curtis Simonson	UNH InterOperability Laboratory

INTRODUCTION

The University of New Hampshire's InterOperability Laboratory (IOL) is an institution designed to improve the interoperability of standards based products by providing an environment where a product can be tested against other implementations of a standard. This suite of tests has been developed to help implementers evaluate the functionality of their IEEE 802.1Q-2003 VLAN capable products.

The operation of Virtual Local Area Networks (VLANs) provides for the creation of multiple, logically separated, "virtual" LANs within the bounds of a single Bridged LAN. Frames associated with a VLAN are not eligible for transmission on any other VLAN.

Each VLAN is a separate broadcast domain. This limits the effect of multicast and broadcast traffic on the total network load. The tagging mechanism provides a means of maintaining a frame's "priority level" for quality of service (QOS) purposes, further enhancing the availability of network resources.

This test suite has been designed based on the set of definitions, principles, and requirements that pertain to IEEE Std. 802.1Q-2003. The test suite is designed to help determine whether or not the DUT will behave in accordance with the standard during normal operation.

These tests do not determine whether the DUT conforms to IEEE Std. 802.1Q-2003, nor are they designed as conformance tests. Rather, they provide one method to isolate problems within a VLAN aware device that will affect interoperability. Successful completion of all tests contained in this suite does not guarantee that the tested device will operate with other VLAN aware devices. However, combined with satisfactory completion of conformance testing, these tests provide a reasonable level of confidence that the DUT will function well in most VLAN environments.

REFERENCES

The following documents are referenced in this text:

- IEEE Std. 802.1Q™-2003

DEFINITION OF TERMS

Abbreviations and Acronyms:

BP	Bridge Partner
CFI	Canonical Format Indicator
DUT	Device Under Test
LAN	Local Area Network
LT	Line Tap
MAC	Medium Access Control
PVID	Port VID
QOS	Quality of Service
TCI	Tag Control Information
TPID	Tag Protocol Identifer
TS	Test Station
VID	VLAN Identifier
VLAN	Virtual LAN

Definitions:

VLAN aware: A property of Bridges or end stations that recognize and support VLAN-tagged frames.

VLAN unaware: A property of Bridges or end stations that do not recognize VLAN-tagged frames.

Member Set: The set of Ports through which members of the VLAN can currently be reached.

Untagged Set: The set of Ports through which, if frames destined for a VLAN are to be transmitted, they shall be transmitted without tag headers. For all other Ports, if frames destined for the VLAN are to be transmitted, they shall be transmitted with tag headers.

Access Link: A LAN segment used to multiplex one or more VLAN-unaware devices into a Port of a VLAN Bridge. None of the frames transmitted on an Access Link carry VLAN identification.

Access Bridge Port: A Bridge Port connected to a LAN via an Access Link. The Port is configured such that none of the frames it transmits contain VLAN identification.

Hybrid Link: A LAN segment that has both VLAN-aware and VLAN-unaware devices attached to it. A Hybrid Link can carry priority-tagged, untagged, and/or VLAN-tagged frames.

Hybrid Bridge Port: A Bridge Port connected to a LAN via a Hybrid Link. The Port is configured such that it may transmit priority-tagged, untagged, and/or VLAN-tagged frames.

Trunk Link: A LAN segment used to connect VLAN-aware devices. All frames transmitted on a Trunk Link contain VLAN identification.

Trunk Bridge Port: A Bridge Port connected to a LAN via a Trunk Link. The Port is configured such that all the frames it transmits contain VLAN identification.

Line Tap: A physical layer test tool that monitors frames on a given link.

Detagged frame: The detagged frame of an untagged frame is the frame itself. The detagged frame of a tagged frame or a priority tagged frame is the frame that results from untagging the frame using the appropriate procedure.

Frame: A unit of data transmission on an IEEE 802 LAN MAC that conveys a protocol data unit (PDU) between MAC service users. There are three types of frame; untagged, VLAN-tagged, and priority-tagged.

Port Label: Indicates a Port on the DUT or BP and the TS or LT it is connected to.

Port Label Examples:

The Port on the DUT connected to TS1 is described as DUT.TS1
The Port on the DUT connected to TS2 is described as DUT.TS2
The Port on the DUT connected to the Line Tap is described as DUT.LT
The Port on the BP connected to TS4 is described as BP.TS4
The Port on the BP connected to TS5 is described as BP.TS5
The Port on the BP connected to the Line Tap is described as BP.LT

That is, the Device and Port number preceding the '.' identifies the Port, and the Device and Port number following the '.' identifies what it is connected to.

Priority-tagged frame: A tagged frame whose tag header carries priority information but no VLAN identification information.

Tagged frame: A tagged frame is a frame that contains a tag header immediately following the Source MAC address field of the frame. There are two types of tagged frames: VLAN-tagged frames and Priority-tagged frames.

Untagged frame: An untagged frame is a frame that does not contain a tag header immediately following the Source MAC address field of the frame.

Tag header: A tag header allows user priority information and, optionally, VLAN identification information to be associated with a frame.

Tag Control Information: A field in the tag header that is two octets in length, and contains user_priority, CFI, and VID fields.

Tag Protocol Identifier: A field in the tag header that contains an Ethernet Type value which identifies the frame as a tagged frame. The Tag Protocol Identifer of an Ethernet encoded frame is two octets in length, and carries the value 0x8100.

User priority: The parameter used to indicate whether an expedited class of traffic should be used (when possible) to provide higher quality of service.

TEST ORGANIZATION

This document organizes tests by group based on related test methodology or goals. Each group begins with a brief set of comments pertaining to all tests within that group. This is followed by a series of description blocks; each block describes a single test. The format of the description block is as follows:

Test Label: The test label and title comprise the first line of the test block. The test label is the concatenation of the short test suite name, group number, and the test number within the group, separated by periods. The test number is the group number and the test number, also separated by a period. So, test label VLAN.io.1.2 refers to the second test of the first test group in the VLAN Interoperabilty suite. The test number is 1.2.

Purpose: The Purpose is a short statement describing what the test attempts to achieve. It is usually phrased as a simple assertion of the feature or capability to be tested.

References: The References section lists cross-references to the specifications and documentation that might be helpful in understanding and evaluating the test and results.

Resource Requirements: The Resource Requirements section specifies the software, hardware, and test equipment that will be needed to perform the test. The Discussion is a general discussion of the test and relevant section of the specification, including any assumptions made in the design or implementation of the test as well as known limitations.

Discussion: The Discussion is a general discussion of the test and relevant section of the specification, including any assumptions made in the design or implementation of the test as well as known limitations.

Test Layout: This diagram shows how the Test Systems, DUT, and any other Devices used should be connected for this test. Elements of the Procedure may change the Layout.

Procedure: This section of the test description contains the step-by-step instructions for carrying out the test. These steps include such things as enabling interfaces, disconnecting links between devices, and sending MAC frames from a Test Station. The test procedure also cues the tester to make observations, which are interpreted in accordance with the observable results given for that test part.

Observable Results: This section lists observable results that can be examined by the tester to verify that the DUT is operating properly. When multiple observable results are possible, this section provides a short discussion on how to interpret them. The determination of a PASS or FAIL for each test is usually based on how the behavior of the DUT compares to the results described in this section.

Possible Problems: This section contains a description of known issues with the test procedure, which may affect test results in certain situations.

TEST SETUP

Each test in this suite uses the following setup for both the DUT and BP:

- If GMRP is supported, disable it.
- If GVRP is supported, disable it.
- Enable the most recent version of the Spanning Tree Protocol supported by the Bridge.
- For each Port used during testing:
  - Set the Acceptable Frame Types Parameter to Admit-all-Frames
  - Set the Enable Ingress Filtering Parameter to Reset (i.e. Disable Ingress Filtering)
- VLAN Configuration:
  - Three VLANs are used for these tests. Because the range of VID values supported by the DUT and BP may vary, these VLANs are referred to by name. The actual VID values used will be recorded in the test results. The "Preferred" values must be used if supported by the DUT and BP.
  - These three VLANs shall be configured on the DUT and BP.
  - No other VLANs shall be configured on the DUT or BP

VLAN Name	***VID Values Preferred***	***Member Set***	***Untagged Set***
Blue	0x001 (Default VID)		DUT.TS1, BP.TS4
Red	0x002		DUT.TS2, BP.TS5
Green	0xFFE	DUT.TS3, BP.TS6	

Port Label	***PVID***
DUT.TS1	Blue
DUT.TS2	Red
DUT.TS3	0x001 (Default VID)
BP.TS4	Blue
BP.TS5	Red
BP.TS6	0x001 (Default VID)

Note: Ports DUT.LT and BP.LT are not members of any VLAN until they are assigned to a VLAN(s) during execution of the test procedure.

Test Traffic

- The following two tables define all frames used during testing.
- All Test Traffic frames are 100 Bytes long, contain random data, and are terminated by a valid FCS. Frames larger than 100 Bytes may be used if desired, provided the length of Test Traffic frames is recorded in the test results. The rate at which Test Traffic frames are transmitted may also vary, provided the rate used is recorded in the test results. The default is to transmit Test Traffic frames at the maximum rate.

Unlearned Destination MAC addresses

Frame Label	***Destination MAC address****	***Source MAC address****	***Tag header***
Uni-1	00 00 00 00 00 00	00 00 00 00 BF C1	None
Multi-1	01 11 11 11 11 11	00 00 00 00 BF C1	None
Broad-1	FF FF FF FF FF FF	00 00 00 00 BF C1	None
Uni-2	00 00 00 00 00 00	00 00 00 00 BF C2	None
Multi-2	01 11 11 11 11 11	00 00 00 00 BF C2	None
Broad-2	FF FF FF FF FF FF	00 00 00 00 BF C2	None
Uni-3	00 00 00 00 00 00	00 00 00 00 BF C3	Green
Multi-3	01 11 11 11 11 11	00 00 00 00 BF C3	Green
Broad-3	FF FF FF FF FF FF	00 00 00 00 BF C3	Green
Uni-4	00 00 00 00 00 00	00 00 00 00 BF C4	None
Multi-4	01 11 11 11 11 11	00 00 00 00 BF C4	None
Broad-4	FF FF FF FF FF FF	00 00 00 00 BF C4	None
Uni-5	00 00 00 00 00 00	00 00 00 00 BF C5	None
Multi-5	01 11 11 11 11 11	00 00 00 00 BF C5	None
Broad-5	FF FF FF FF FF FF	00 00 00 00 BF C5	None
Uni-6	00 00 00 00 00 00	00 00 00 00 BF C6	Green
Multi-6	01 11 11 11 11 11	00 00 00 00 BF C6	Green
Broad-6	FF FF FF FF FF FF	00 00 00 00 BF C6	Green

*All MAC address values are hexadecimal

Note – If a NULL destination MAC address is not forwarded by the DUT, or it's LP, use an address equal to "00 00 00 00 00 01".

Learned Destination MAC addresses

Frame Label	***Destination MAC address****	***Source MAC address****	***Tag header***
D4-1	00 00 00 00 BF C4	00 00 00 BE EF 01	None
D5-1	00 00 00 00 BF C5	00 00 00 BE EF 01	None
D6-1	00 00 00 00 BF C6	00 00 00 BE EF 01	None
D4-2	00 00 00 00 BF C4	00 00 00 BE EF 02	None
D5-2	00 00 00 00 BF C5	00 00 00 BE EF 02	None
D6-2	00 00 00 00 BF C6	00 00 00 BE EF 02	None
D4-3	00 00 00 00 BF C4	00 00 00 BE EF 03	Green
D5-3	00 00 00 00 BF C5	00 00 00 BE EF 03	Green
D6-3	00 00 00 00 BF C6	00 00 00 BE EF 03	Green
D1-4	00 00 00 00 BF C1	00 00 00 BE EF 04	None
D2-4	00 00 00 00 BF C2	00 00 00 BE EF 04	None
D3-4	00 00 00 00 BF C3	00 00 00 BE EF 04	None
D1-5	00 00 00 00 BF C1	00 00 00 BE EF 05	None
D2-5	00 00 00 00 BF C2	00 00 00 BE EF 05	None
D3-5	00 00 00 00 BF C3	00 00 00 BE EF 05	None
D1-6	00 00 00 00 BF C1	00 00 00 BE EF 06	Green
D2-6	00 00 00 00 BF C2	00 00 00 BE EF 06	Green
D3-6	00 00 00 00 BF C3	00 00 00 BE EF 06	Green

*All MAC address values are hexadecimal

Notes on Observable Results:

The observable results portion of each test contains a table of frame labels and Test Stations.

When test traffic (identified by one of the frame labels above) is expected on a particular Test Station, the table indicates whether a tag header should be present in the captured frames (and if so, the format of the tag header).

U = Untagged
B = Blue VLAN-tagged
R = Red VLAN-tagged
G = Green VLAN-tagged

In each case, 10 frames of each type will be transmitted. In each test case, Test Stations shall capture exactly 10 frames of each type identified by frame label, indicated by the observable results table.

GROUP 1: DUT and BP are Connected via Access Link

Scope

Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via an Access Link.

Overview

For each of these tests:

Three Test Stations are connected to the DUT via Blue Access, Red Access, and Green Trunk Links, respectively.

Three Test Stations are connected to the BP via Blue Access, Red Access, and Green Trunk Links, respectively.

A Line Tap is placed on the link between the DUT and BP.

The link between the DUT and BP is configured as one of the following link types (the type of link used varies with each Test):

- Blue Access Link
- Red Access Link
- Green Access Link

The Test Stations are set to capture.

The Test Stations transmit Test Traffic.

The Observable Results are evaluated.

VLAN.io.1.1 : Blue Access Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Blue Access Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

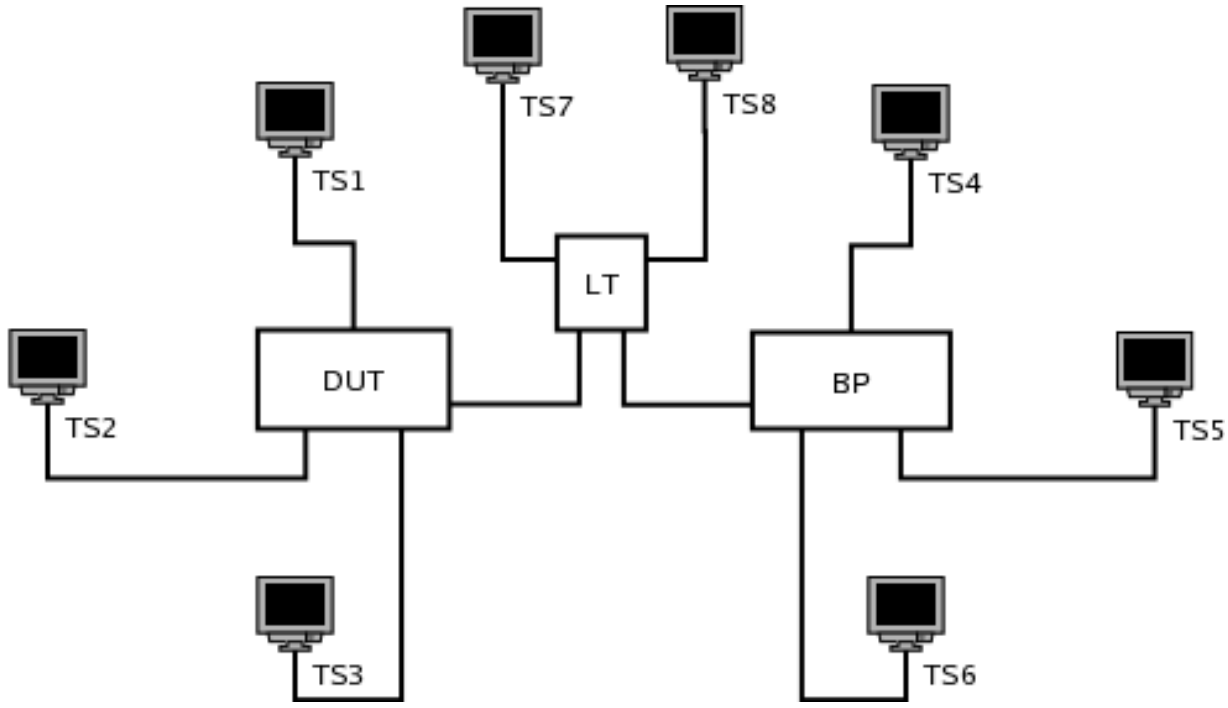
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Blue Access Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to Blue.
3. Set Port BP.LT's PVID to Blue.
4. Add Port DUT.LT to the Untagged Set for the Blue VLAN.
5. Add Port BP.LT to the Untagged Set for the Blue VLAN.
6. Start capture on Test Stations 1-8
7. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
8. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
9. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
10. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
11. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
12. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
13. Wait 2 seconds.
14. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
15. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
16. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
17. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
18. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
19. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
20. Wait 2 seconds.
21. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1				U			U	
	Multi-1				U			U	
	Broad-1				U			U	
	Uni-2								
	Multi-2								
	Broad-2								
	Uni-3								
	Multi-3								
	Broad-3								
	Uni-4	U							U
	Multi-4	U							U
	Broad-4	U							U
	Uni-5								
	Multi-5								
	Broad-5								
	Uni-6								
	Multi-6								
	Broad-6								

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	D4-1				U (SVL/IVL)			U (SVL/IVL)	
	D5-1				U (IVL)			U (SVL/IVL)	
	D6-1				U (IVL)			U (SVL/IVL)	
	D4-2								
	D5-2								
	D6-2								
	D4-3								
	D5-3								
	D6-3								
	D1-4	U (SVL/IVL)							U (SVL/IVL)
	D2-4	U (IVL)							U (SVL/IVL)
	D3-4	U (IVL)							U (SVL/IVL)
	D1-5								
	D2-5								
	D3-5								
	D1-6								
	D2-6								
	D3-6								

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.1.2 : Red Access Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Red Access Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

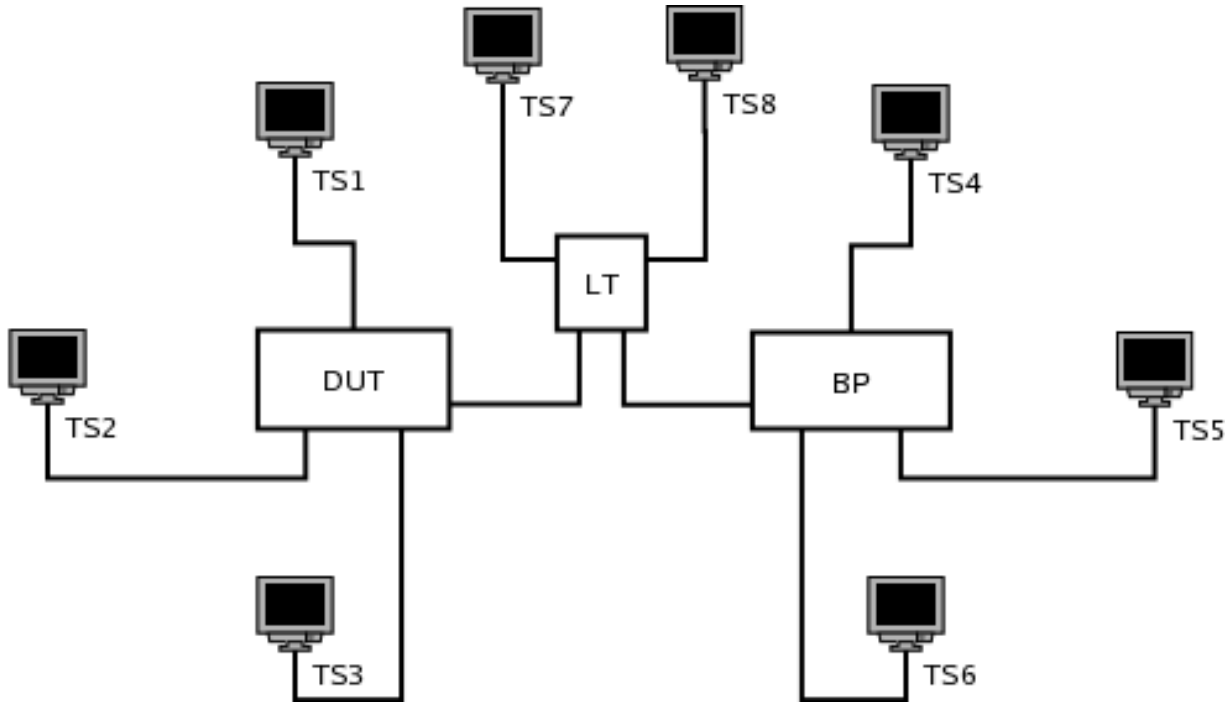
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Red Access Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to Red.
3. Set Port BP.LT's PVID to Red.
4. Add Port DUT.LT to the Untagged Set for the Red VLAN.
5. Add Port BP.LT to the Untagged Set for the Red VLAN.
6. Start capture on Test Stations 1-8
7. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
8. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
9. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
10. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
11. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
12. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
13. Wait 2 seconds.
14. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
15. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
16. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
17. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
18. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
19. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
20. Wait 2 seconds.
21. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1								
	Multi-1								
	Broad-1								
	Uni-2					U		U	
	Multi-2					U		U	
	Broad-2					U		U	
	Uni-3								
	Multi-3								
	Broad-3								
	Uni-4								
	Multi-4								
	Broad-4								
	Uni-5		U						U
	Multi-5		U						U
	Broad-5		U						U
	Uni-6								
	Multi-6								
	Broad-6								

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	D4-1								
	D5-1								
	D6-1								
	D4-2					U (IVL)		U (SVL/IVL)	
	D5-2					U (SVL/IVL)		U (SVL/IVL)	
	D6-2					U (IVL)		U (SVL/IVL)	
	D4-3								
	D5-3								
	D6-3								
	D1-4								
	D2-4								
	D3-4								
	D1-5		U (IVL)						U (SVL/IVL)
	D2-5		U (SVL/IVL)						U (SVL/IVL)
	D3-5		U (IVL)						U (SVL/IVL)
	D1-6								
	D2-6								
	D3-6								

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.1.3 : Green Access Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Green Access Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

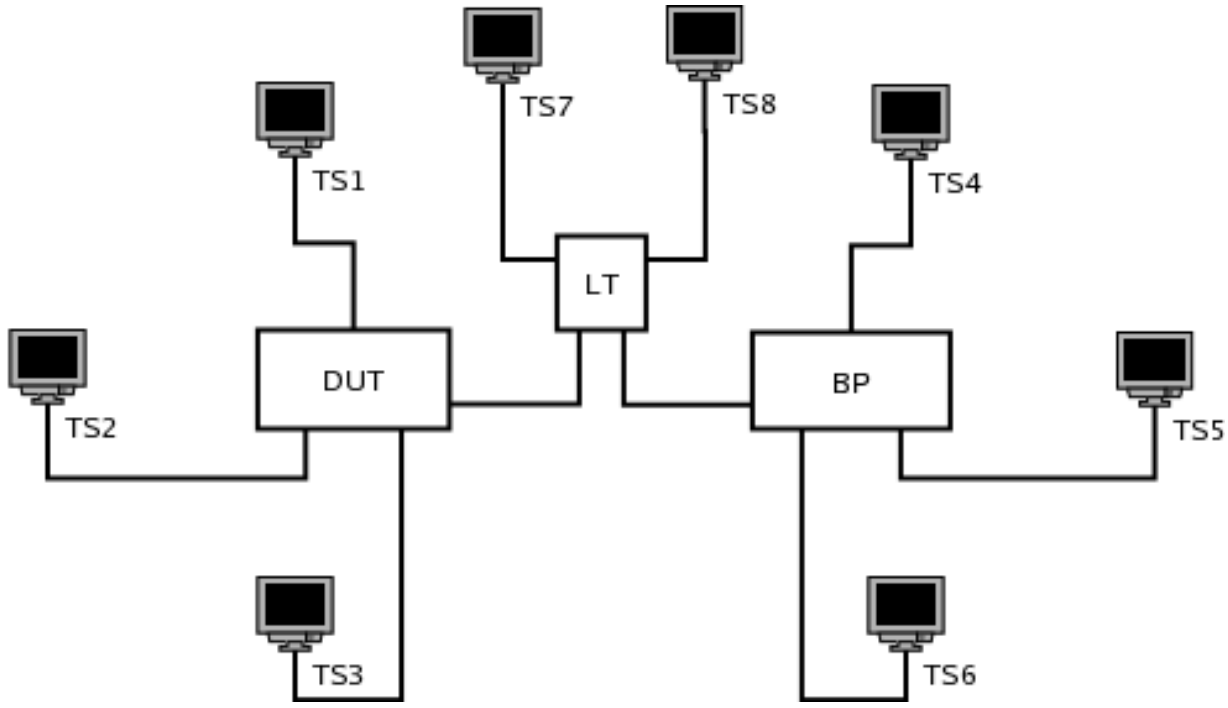
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Green Access Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to Green.
3. Set Port BP.LT's PVID to Green.
4. Add Port DUT.LT to the Untagged Set for the Green VLAN.
5. Add Port BP.LT to the Untagged Set for the Green VLAN.
6. Start capture on Test Stations 1-8
7. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
8. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
9. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
10. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
11. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
12. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
13. Wait 2 seconds.
14. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
15. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
16. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
17. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
18. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
19. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
20. Wait 2 seconds.
21. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1								
	Multi-1								
	Broad-1								
	Uni-2								
	Multi-2								
	Broad-2								
	Uni-3						G	G	
	Multi-3						G	G	
	Broad-3						G	G	
	Uni-4								
	Multi-4								
	Broad-4								
	Uni-5								
	Multi-5								
	Broad-5								
	Uni-6			G					G
	Multi-6			G					G
	Broad-6			G					G

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**								
	D5-1								
	D6-1								
	D4-2								
	D5-2								
	D6-2								
	D4-3						G (IVL)	G (SVL/IVL)	
	D5-3						G (IVL)	G (SVL/IVL)	
	D6-3						G (SVL/IVL)	G (SVL/IVL)	
	D1-4								
	D2-4								
	D3-4								
	D1-5								
	D2-5								
	D3-5								
	D1-6			G (IVL)					G (SVL/IVL)
	D2-6			G (IVL)					G (SVL/IVL)
	D3-6			G (SVL/IVL)					G (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G T). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

GROUP 2: DUT and BP are Connected via Trunk Link

Scope

Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Trunk Link.

Overview

For each of these tests:

Three Test Stations are connected to the DUT via Blue Access, Red Access, and Green Trunk Links, respectively.

Three Test Stations are connected to the BP via Blue Access, Red Access, and Green Trunk Links, respectively.

A Line Tap is placed on the link between the DUT and BP.

The link between the DUT and BP is configured as one of the following link types (the type of link used varies with each Test):

- Blue Trunk Link
- Red Trunk Link
- Green Trunk Link
- Blue/Red Trunk Link
- Blue/Green Trunk Link
- Red/Green Trunk Link
- Blue/Red/Green Trunk Link

The Test Stations are set to capture.

The Test Stations transmit Test Traffic.

The Observable Results are evaluated.

VLAN.io.2.1 : Blue Trunk Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Blue Trunk Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

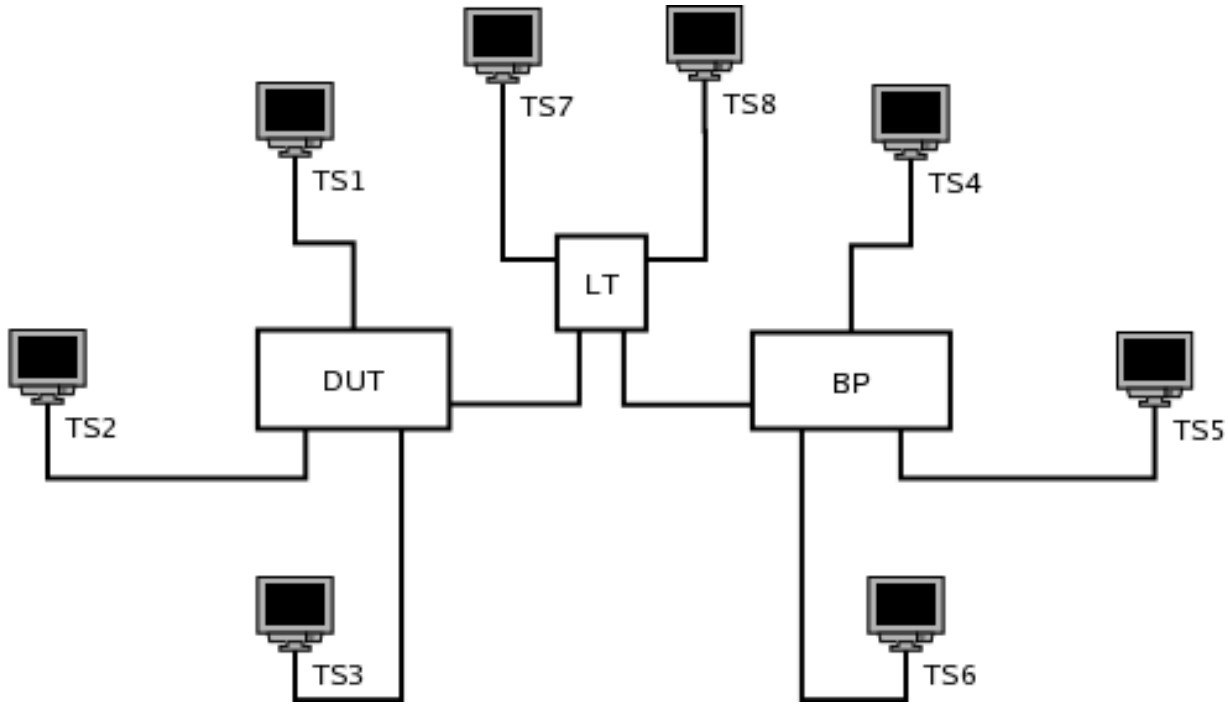
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Blue Trunk Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to 0x001.
3. Set Port BP.LT's PVID to 0x001.
4. Add Port DUT.LT to the Member Set for the Blue VLAN.
5. Add Port BP.LT to the Member Set for the Blue VLAN.
6. Start capture on Test Stations 1-8
7. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
8. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
9. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
10. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
11. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
12. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
13. Wait 2 seconds.
14. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
15. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
16. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
17. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
18. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
19. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
20. Wait 2 seconds.
21. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		***TS1***	***TS2***	***TS3***	***TS4***	***TS5***	***TS6***	***TS7***	***TS8***
	Uni-1				U			B	
	Multi-1				U			B	
	Broad-1				U			B	
	Uni-2								
	Multi-2								
	Broad-2								
	Uni-3								
	Multi-3								
	Broad-3								
	Uni-4	U							B
	Multi-4	U							B
	Broad-4	U							B
	Uni-5								
	Multi-5								
	Broad-5								
	Uni-6								
	Multi-6								
	Broad-6								

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	D4-1				U (SVL/IVL)			B (SVL/IVL)	
	D5-1				U (IVL)			B (SVL/IVL)	
	D6-1				U (IVL)			B (SVL/IVL)	
	D4-2								
	D5-2								
	D6-2								
	D4-3								
	D5-3								
	D6-3								
	D1-4	U (SVL/IVL)							B (SVL/IVL)
	D2-4	U (IVL)							B (SVL/IVL)
	D3-4	U (IVL)							B (SVL/IVL)
	D1-5								
	D2-5								
	D3-5								
	D1-6								
	D2-6								
	D3-6								

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.2.2 : Red Trunk Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Red Trunk Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

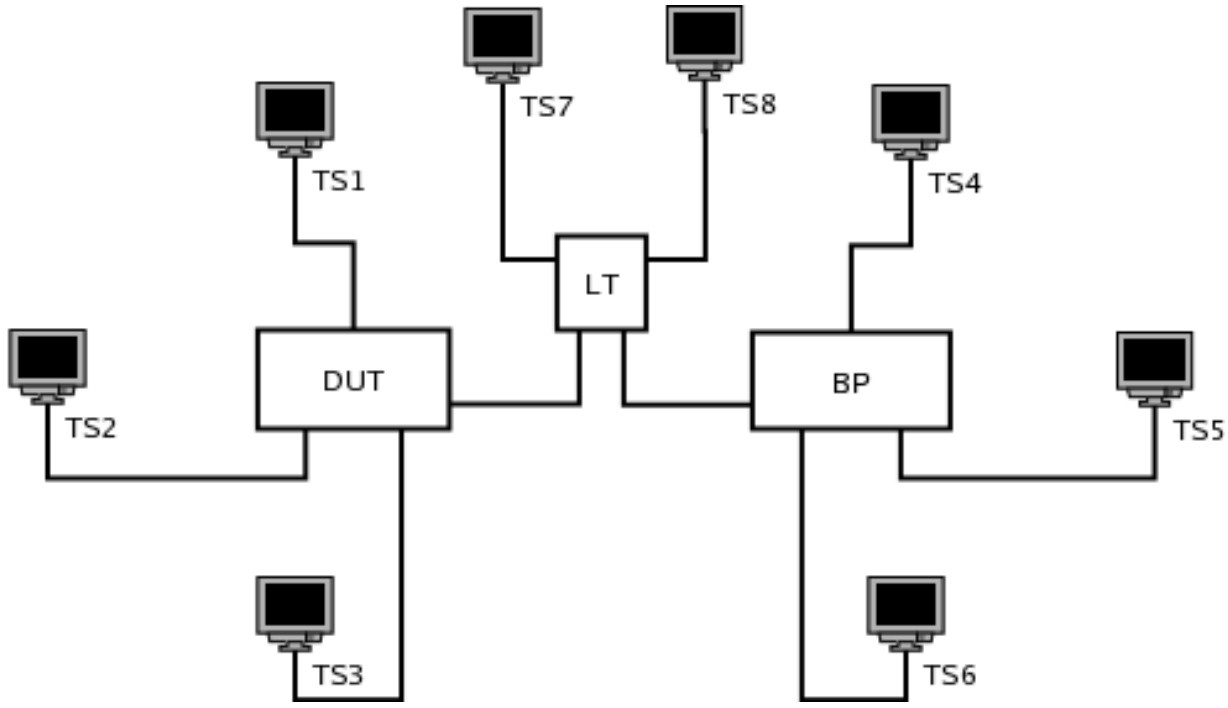
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Red Trunk Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to 0x001.
3. Set Port BP.LT's PVID to 0x001.
4. Add Port DUT.LT to the Member Set for the Red VLAN.
5. Add Port BP.LT to the Member Set for the Red VLAN.
6. Start capture on Test Stations 1-8
7. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
8. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
9. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
10. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
11. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
12. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
13. Wait 2 seconds.
14. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
15. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
16. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
17. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
18. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
19. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
20. Wait 2 seconds.
21. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		***TS1***	***TS2***	***TS3***	***TS4***	***TS5***	***TS6***	***TS7***	***TS8***
	Uni-1								
	Multi-1								
	Broad-1								
	Uni-2					U		R	
	Multi-2					U		R	
	Broad-2					U		R	
	Uni-3								
	Multi-3								
	Broad-3								
	Uni-4								
	Multi-4								
	Broad-4								
	Uni-5		U						R
	Multi-5		U						R
	Broad-5		U						R
	Uni-6								
	Multi-6								
	Broad-6								

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**								
	D5-1								
	D6-1								
	D4-2					U (IVL)		R (SVL/IVL)	
	D5-2					U (SVL/IVL)		R (SVL/IVL)	
	D6-2					U (IVL)		R (SVL/IVL)	
	D4-3								
	D5-3								
	D6-3								
	D1-4								
	D2-4								
	D3-4								
	D1-5		U (IVL)						R (SVL/IVL)
	D2-5		U (SVL/IVL)						R (SVL/IVL)
	D3-5		U (IVL)						R (SVL/IVL)
	D1-6								
	D2-6								
	D3-6								

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.2.3 : Green Trunk Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Green Trunk Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

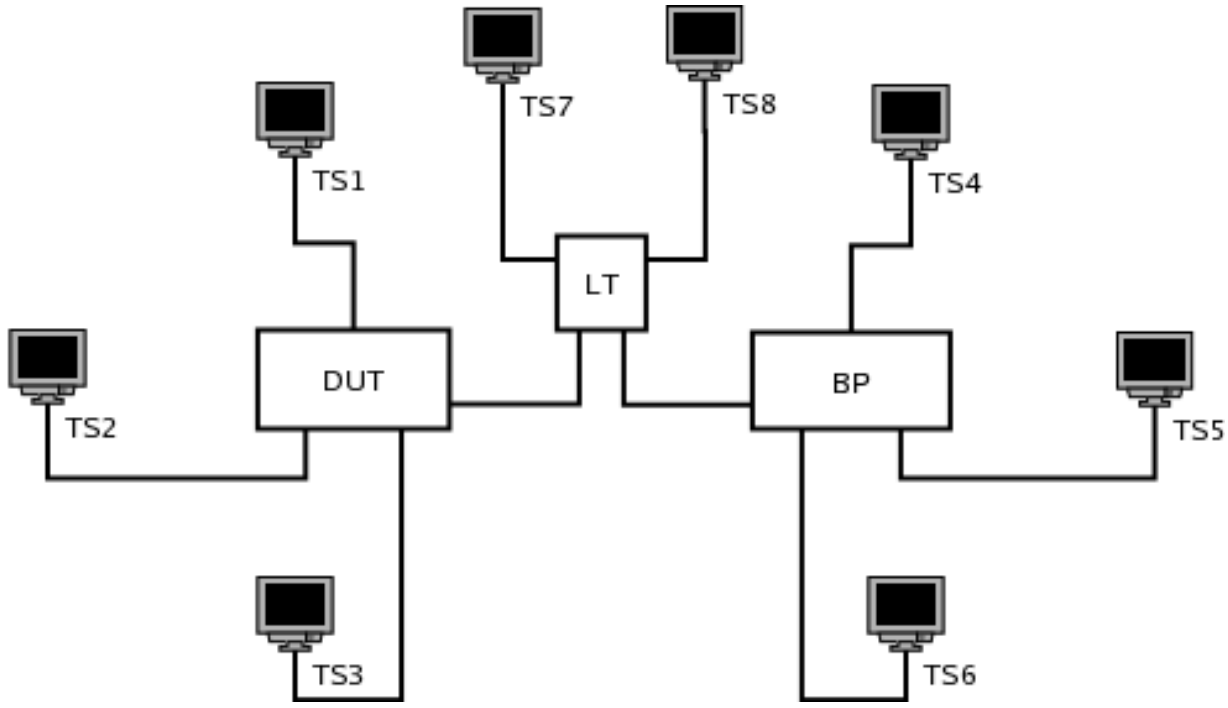
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Green Trunk Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to 0x001.
3. Set Port BP.LT's PVID to 0x001.
4. Add Port DUT.LT to the Member Set for the Green VLAN.
5. Add Port BP.LT to the Member Set for the Green VLAN.
6. Start capture on Test Stations 1-8
7. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
8. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
9. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
10. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
11. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
12. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
13. Wait 2 seconds.
14. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
15. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
16. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
17. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
18. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
19. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
20. Wait 2 seconds.
21. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1								
	Multi-1								
	Broad-1								
	Uni-2								
	Multi-2								
	Broad-2								
	Uni-3						G	G	
	Multi-3						G	G	
	Broad-3						G	G	
	Uni-4								
	Multi-4								
	Broad-4								
	Uni-5								
	Multi-5								
	Broad-5								
	Uni-6			G					G
	Multi-6			G					G
	Broad-6			G					G

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**								
	D5-1								
	D6-1								
	D4-2								
	D5-2								
	D6-2								
	D4-3						G (IVL)	G (SVL/IVL)	
	D5-3						G (IVL)	G (SVL/IVL)	
	D6-3						G (SVL/IVL)	G (SVL/IVL)	
	D1-4								
	D2-4								
	D3-4								
	D1-5								
	D2-5								
	D3-5								
	D1-6			G (IVL)					G (SVL/IVL)
	D2-6			G (IVL)					G (SVL/IVL)
	D3-6			G (SVL/IVL)					G (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.2.4 : Blue/Red Trunk Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Blue and Red Trunk Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

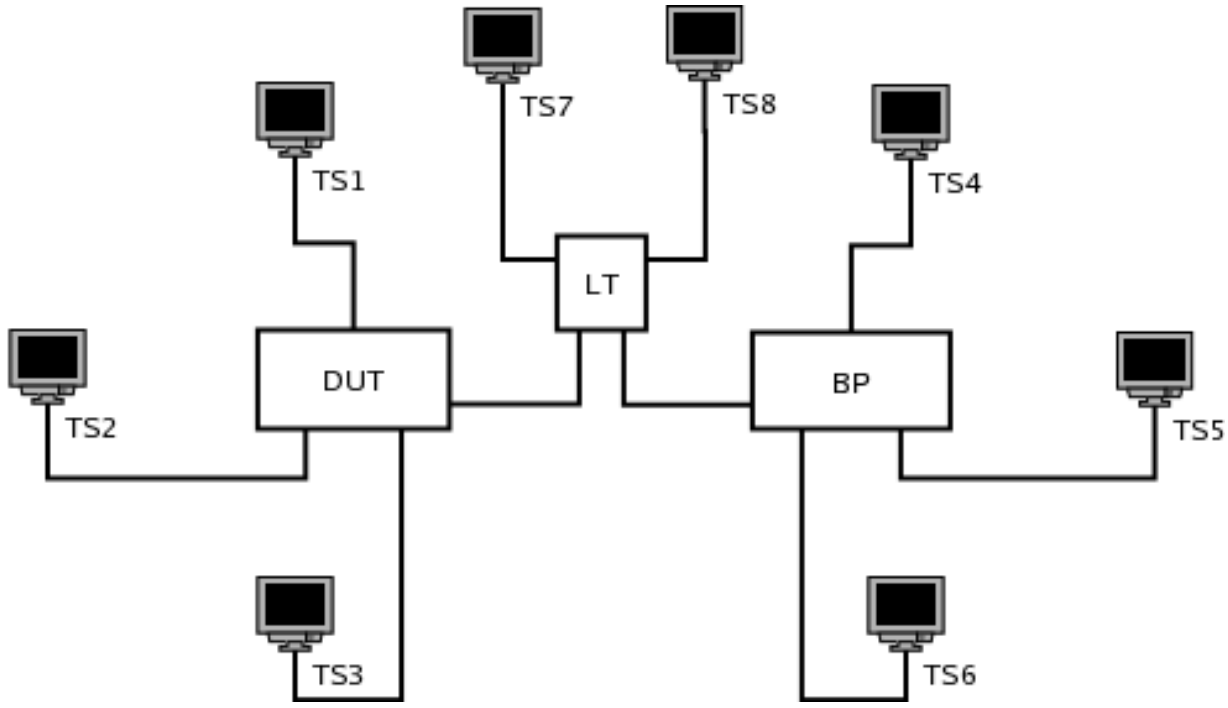
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Blue/Red Trunk Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to 0x001.
3. Set Port BP.LT's PVID to 0x001.
4. Add Port DUT.LT to the Member Set for the Blue VLAN.
5. Add Port DUT.LT to the Member Set for the Red VLAN.
6. Add Port BP.LT to the Member Set for the Blue VLAN.
7. Add Port BP.LT to the Member Set for the Red VLAN.
8. Start capture on Test Stations 1-8
9. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
10. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
11. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
12. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
13. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
14. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
15. Wait 2 seconds.
16. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
17. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
18. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
19. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
20. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
21. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
22. Wait 2 seconds.
23. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1				U			B	
	Multi-1				U			B	
	Broad-1				U			B	
	Uni-2					U		R	
	Multi-2					U		R	
	Broad-2					U		R	
	Uni-3								
	Multi-3								
	Broad-3								
	Uni-4	U							B
	Multi-4	U							B
	Broad-4	U							B
	Uni-5		U						R
	Multi-5		U						R
	Broad-5		U						R
	Uni-6								
	Multi-6								
	Broad-6								

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**				U (SVL/IVL)			B (SVL/IVL)	
	D5-1				U (IVL)			B (SVL/IVL)	
	D6-1				U (IVL)			B (SVL/IVL)	
	D4-2					U (IVL)		R (SVL/IVL)	
	D5-2					U (SVL/IVL)		R (SVL/IVL)	
	D6-2					U (IVL)		R (SVL/IVL)	
	D4-3								
	D5-3								
	D6-3								
	D1-4	U (SVL/IVL)							B (SVL/IVL)
	D2-4	U (IVL)							B (SVL/IVL)
	D3-4	U (IVL)							B (SVL/IVL)
	D1-5		U (IVL)						R (SVL/IVL)
	D2-5		U (SVL/IVL)						R (SVL/IVL)
	D3-5		U (IVL)						R (SVL/IVL)
	D1-6								
	D2-6								
	D3-6								

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.2.5 : Blue/Green Trunk Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Blue and Green Trunk Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

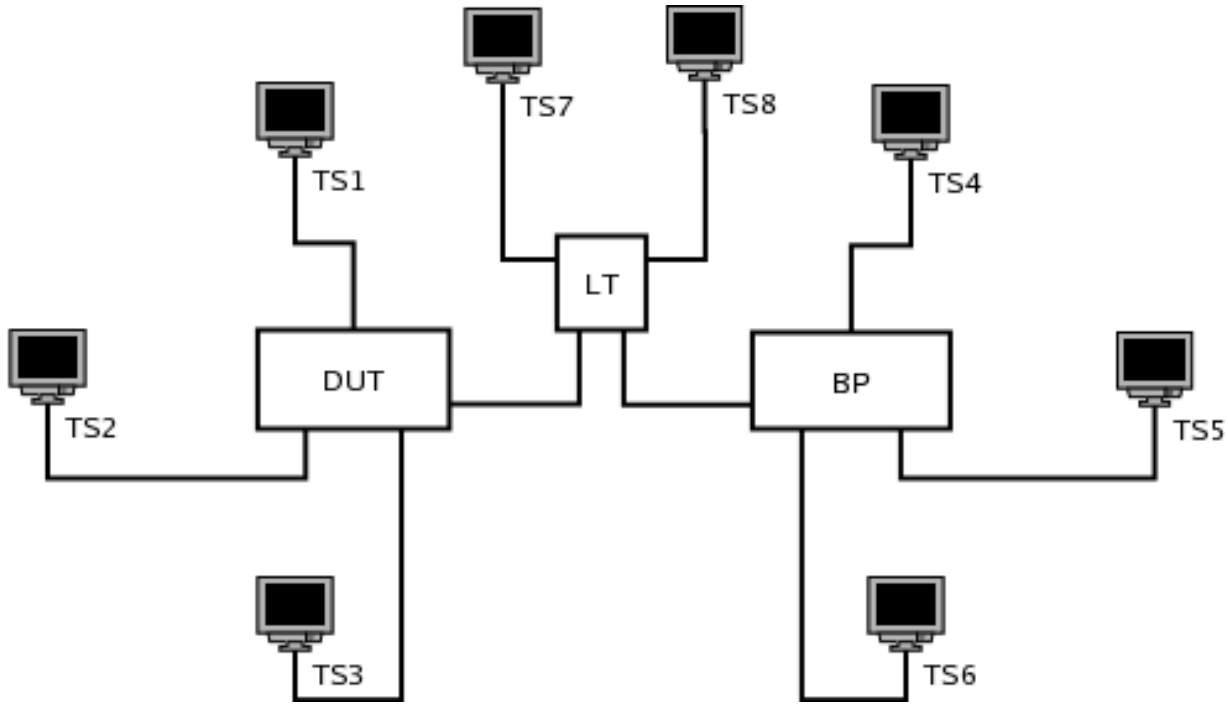
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Blue/Green Trunk Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to 0x001.
3. Set Port BP.LT's PVID to 0x001.
4. Add Port DUT.LT to the Member Set for the Blue VLAN.
5. Add Port DUT.LT to the Member Set for the Green VLAN.
6. Add Port BP.LT to the Member Set for the Blue VLAN.
7. Add Port BP.LT to the Member Set for the Green VLAN.
8. Start capture on Test Stations 1-8
9. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
10. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
11. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
12. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
13. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
14. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
15. Wait 2 seconds.
16. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
17. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
18. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
19. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
20. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
21. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
22. Wait 2 seconds.
23. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1				U			B	
	Multi-1				U			B	
	Broad-1				U			B	
	Uni-2								
	Multi-2								
	Broad-2								
	Uni-3						G	G	
	Multi-3						G	G	
	Broad-3						G	G	
	Uni-4	U							B
	Multi-4	U							B
	Broad-4	U							B
	Uni-5								
	Multi-5								
	Broad-5								
	Uni-6			G					G
	Multi-6			G					G
	Broad-6			G					G

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**				U (SVL/IVL)			B (SVL/IVL)	
	D5-1				U (IVL)			B (SVL/IVL)	
	D6-1				U (IVL)			B (SVL/IVL)	
	D4-2								
	D5-2								
	D6-2								
	D4-3						G (IVL)	G (SVL/IVL)	
	D5-3						G (IVL)	G (SVL/IVL)	
	D6-3						G (SVL/IVL)	G (SVL/IVL)	
	D1-4	U (SVL/IVL)							B (SVL/IVL)
	D2-4	U (IVL)							B (SVL/IVL)
	D3-4	U (IVL)							B (SVL/IVL)
	D1-5								
	D2-5								
	D3-5								
	D1-6			G (IVL)					G (SVL/IVL)
	D2-6			G (IVL)					G (SVL/IVL)
	D3-6			G (SVL/IVL)					G (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.2.6 : Red/Green Trunk Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Red and Green Trunk Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

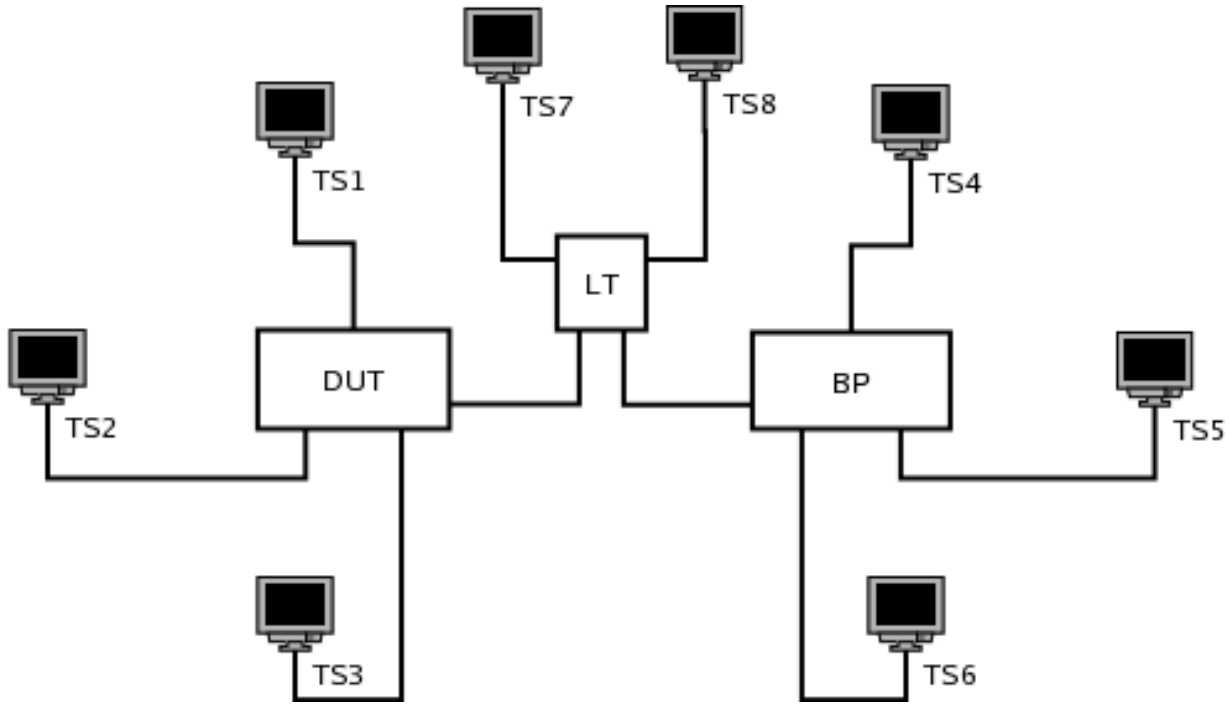
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Red/Green Trunk Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to 0x001.
3. Set Port BP.LT's PVID to 0x001.
4. Add Port DUT.LT to the Member Set for the Red VLAN.
5. Add Port DUT.LT to the Member Set for the Green VLAN.
6. Add Port BP.LT to the Member Set for the Red VLAN.
7. Add Port BP.LT to the Member Set for the Green VLAN.
8. Start capture on Test Stations 1-8
9. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
10. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
11. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
12. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
13. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
14. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
15. Wait 2 seconds.
16. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
17. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
18. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
19. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
20. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
21. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
22. Wait 2 seconds.
23. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1								
	Multi-1								
	Broad-1								
	Uni-2					U		R	
	Multi-2					U		R	
	Broad-2					U		R	
	Uni-3						G	G	
	Multi-3						G	G	
	Broad-3						G	G	
	Uni-4								
	Multi-4								
	Broad-4								
	Uni-5		U						R
	Multi-5		U						R
	Broad-5		U						R
	Uni-6			G					G
	Multi-6			G					G
	Broad-6			G					G

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**								
	D5-1								
	D6-1								
	D4-2					U (IVL)		R (SVL/IVL)	
	D5-2					U (SVL/IVL)		R (SVL/IVL)	
	D6-2					U (IVL)		R (SVL/IVL)	
	D4-3						G (IVL)	G (SVL/IVL)	
	D5-3						G (IVL)	G (SVL/IVL)	
	D6-3						G (SVL/IVL)	G (SVL/IVL)	
	D1-4								
	D2-4								
	D3-4								
	D1-5		U (IVL)						R (SVL/IVL)
	D2-5		U (SVL/IVL)						R (SVL/IVL)
	D3-5		U (IVL)						R (SVL/IVL)
	D1-6			G (IVL)					G (SVL/IVL)
	D2-6			G (IVL)					G (SVL/IVL)
	D3-6			G (SVL/IVL)					G (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.2.7 : Blue/Red/Green Trunk Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Blue, Red, and Green Trunk Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

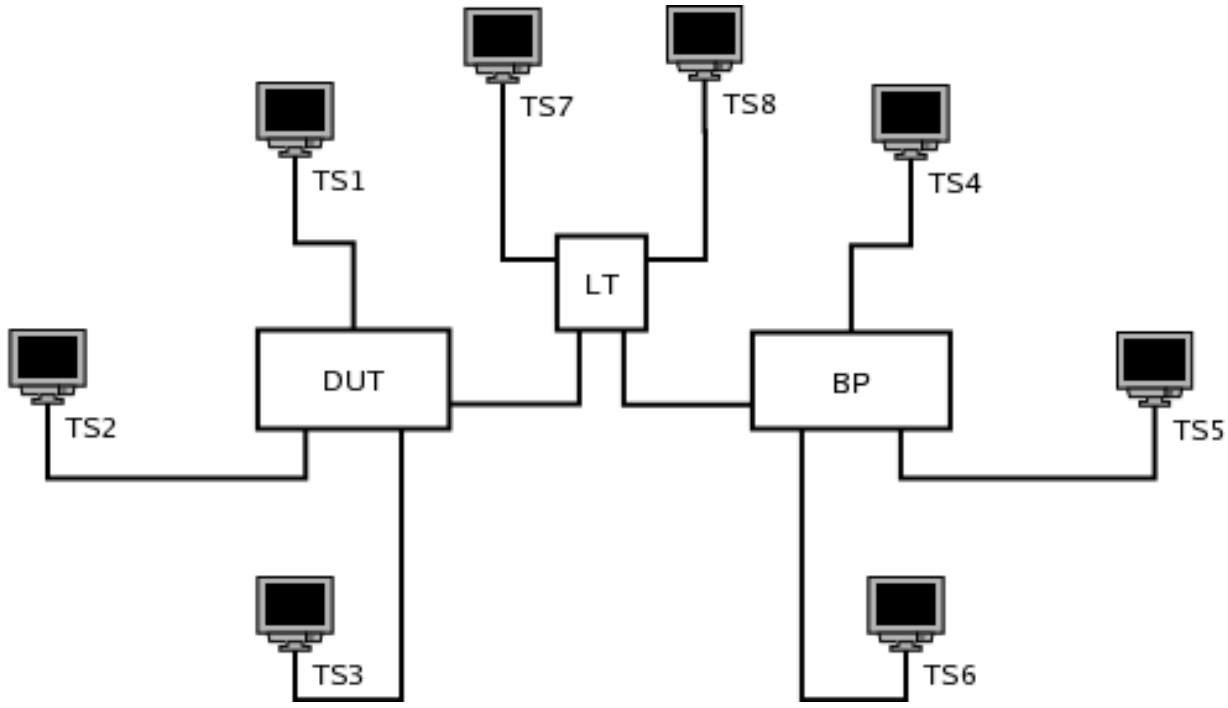
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Blue/Red/Green Trunk Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to 0x001.
3. Set Port BP.LT's PVID to 0x001.
4. Add Port DUT.LT to the Member Set for the Blue VLAN.
5. Add Port DUT.LT to the Member Set for the Red VLAN.
6. Add Port DUT.LT to the Member Set for the Green VLAN.
7. Add Port BP.LT to the Member Set for the Blue VLAN.
8. Add Port BP.LT to the Member Set for the Red VLAN.
9. Add Port BP.LT to the Member Set for the Green VLAN.
10. Start capture on Test Stations 1-8
11. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
12. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
13. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
14. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
15. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
16. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
17. Wait 2 seconds.
18. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
19. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
20. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
21. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
22. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
23. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
24. Wait 2 seconds.
25. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1				U			B	
	Multi-1				U			B	
	Broad-1				U			B	
	Uni-2					U		R	
	Multi-2					U		R	
	Broad-2					U		R	
	Uni-3						G	G	
	Multi-3						G	G	
	Broad-3						G	G	
	Uni-4	U							B
	Multi-4	U							B
	Broad-4	U							B
	Uni-5		U						R
	Multi-5		U						R
	Broad-5		U						R
	Uni-6			G					G
	Multi-6			G					G
	Broad-6			G					G

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**				U (SVL/IVL)			B (SVL/IVL)	
	D5-1				U (IVL)			B (SVL/IVL)	
	D6-1				U (IVL)			B (SVL/IVL)	
	D4-2					U (IVL)		R (SVL/IVL)	
	D5-2					U (SVL/IVL)		R (SVL/IVL)	
	D6-2					U (IVL)		R (SVL/IVL)	
	D4-3						G (IVL)	G (SVL/IVL)	
	D5-3						G (IVL)	G (SVL/IVL)	
	D6-3						G (SVL/IVL)	G (SVL/IVL)	
	D1-4	U (SVL/IVL)							B (SVL/IVL)
	D2-4	U (IVL)							B (SVL/IVL)
	D3-4	U (IVL)							B (SVL/IVL)
	D1-5		U (IVL)						R (SVL/IVL)
	D2-5		U (SVL/IVL)						R (SVL/IVL)
	D3-5		U (IVL)						R (SVL/IVL)
	D1-6			G (IVL)					G (SVL/IVL)
	D2-6			G (IVL)					G (SVL/IVL)
	D3-6			G (SVL/IVL)					G (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

GROUP 3: DUT and BP are Connected via Hybrid Link

Scope

Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Hybrid Link.

Overview

For each of these tests:

Three Test Stations are connected to the DUT via Blue Access, Red Access, and Green Trunk Links, respectively.

Three Test Stations are connected to the BP via Blue Access, Red Access, and Green Trunk Links, respectively.

A Line Tap is placed on the link between the DUT and BP.

The link between the DUT and BP is configured as one of the following link types (the type of link used varies with each Test):

- Blue/Red Trunk, Green Access Link
- Blue/Green Trunk, Red Access Link
- Red/Green Trunk, Blue Access Link

The Test Stations are set to capture.

The Test Stations transmit Test Traffic.

The Observable Results are evaluated.

VLAN.io.3.1 : Blue/Red Trunk, Green Access Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Blue and Red Trunk, Green Access Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

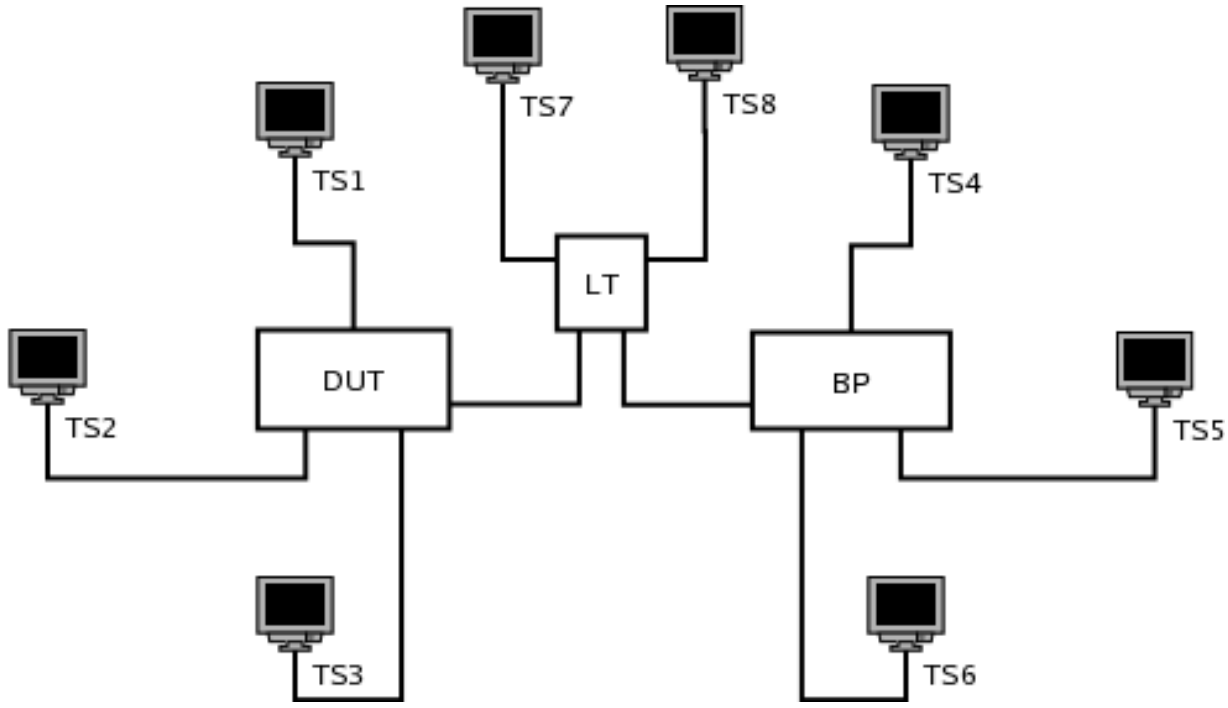
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Blue/Red Trunk, Green Access Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to Green.
3. Set Port BP.LT's PVID to Green.
4. Add Port DUT.LT to the Member Set for the Blue VLAN.
5. Add Port DUT.LT to the Member Set for the Red VLAN.
6. Add Port DUT.LT to the Untagged Set for the Green VLAN.
7. Add Port BP.LT to the Member Set for the Blue VLAN.
8. Add Port BP.LT to the Member Set for the Red VLAN.
9. Add Port BP.LT to the Untagged Set for the Green VLAN.
10. Start capture on Test Stations 1-8
11. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
12. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
13. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
14. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
15. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
16. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
17. Wait 2 seconds.
18. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
19. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
20. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
21. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
22. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
23. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
24. Wait 2 seconds.
25. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1				U			B	
	Multi-1				U			B	
	Broad-1				U			B	
	Uni-2					U		R	
	Multi-2					U		R	
	Broad-2					U		R	
	Uni-3						G	U	
	Multi-3						G	U	
	Broad-3						G	U	
	Uni-4	U							B
	Multi-4	U							B
	Broad-4	U							B
	Uni-5		U						R
	Multi-5		U						R
	Broad-5		U						R
	Uni-6			G					U
	Multi-6			G					U
	Broad-6			G					U

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**				U (SVL/IVL)			B (SVL/IVL)	
	D5-1				U (IVL)			B (SVL/IVL)	
	D6-1				U (IVL)			B (SVL/IVL)	
	D4-2					U (IVL)		R (SVL/IVL)	
	D5-2					U (SVL/IVL)		R (SVL/IVL)	
	D6-2					U (IVL)		R (SVL/IVL)	
	D4-3						G (IVL)	U (SVL/IVL)	
	D5-3						G (IVL)	U (SVL/IVL)	
	D6-3						G (SVL/IVL)	U (SVL/IVL)	
	D1-4	U (SVL/IVL)							B (SVL/IVL)
	D2-4	U (IVL)							B (SVL/IVL)
	D3-4	U (IVL)							B (SVL/IVL)
	D1-5		U (IVL)						R (SVL/IVL)
	D2-5		U (SVL/IVL)						R (SVL/IVL)
	D3-5		U (IVL)						R (SVL/IVL)
	D1-6			G (IVL)					U (SVL/IVL)
	D2-6			G (IVL)					U (SVL/IVL)
	D3-6			G (SVL/IVL)					U (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.3.2 : Blue/Green Trunk, Red Access Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Blue and Green Trunk, Red Access Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

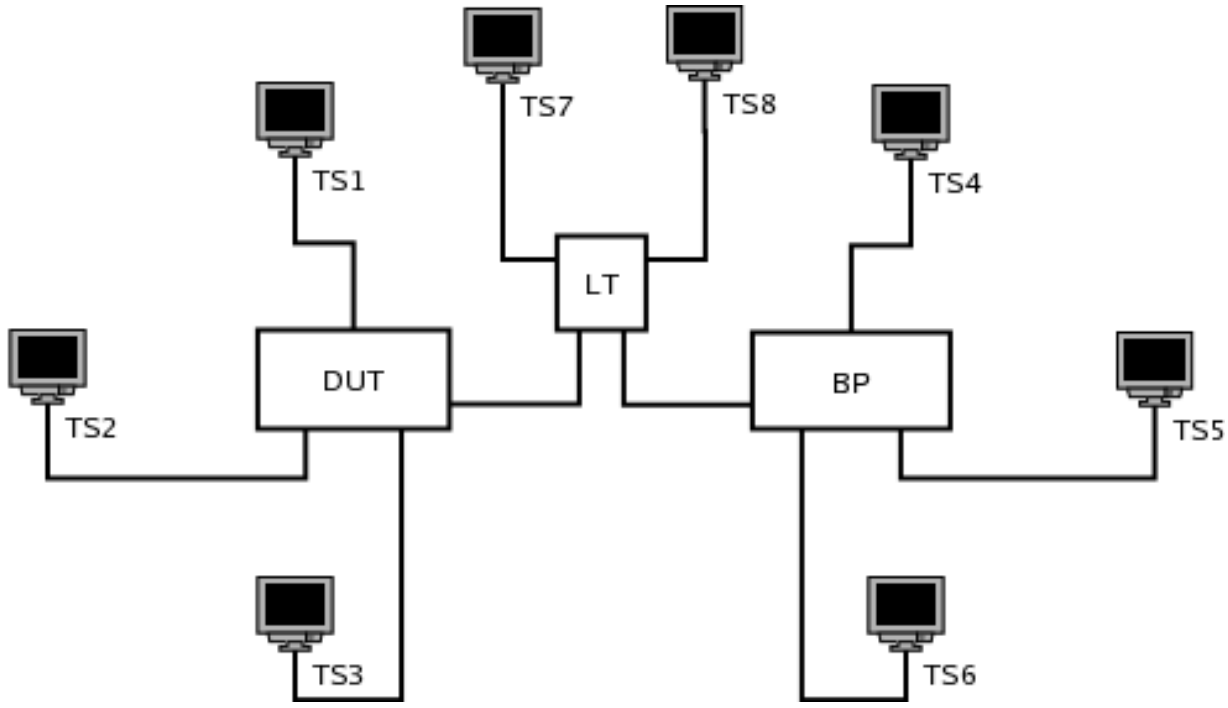
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Blue/Green Trunk, Red Access Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to Red.
3. Set Port BP.LT's PVID to Red.
4. Add Port DUT.LT to the Member Set for the Blue VLAN.
5. Add Port DUT.LT to the Untagged Set for the Red VLAN.
6. Add Port DUT.LT to the Member Set for the Green VLAN.
7. Add Port BP.LT to the Member Set for the Blue VLAN.
8. Add Port BP.LT to the Untagged Set for the Red VLAN.
9. Add Port BP.LT to the Member Set for the Green VLAN.
10. Start capture on Test Stations 1-8
11. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
12. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
13. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
14. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
15. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
16. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
17. Wait 2 seconds.
18. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
19. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
20. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
21. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
22. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
23. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
24. Wait 2 seconds.
25. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1				U			B	
	Multi-1				U			B	
	Broad-1				U			B	
	Uni-2					U		U	
	Multi-2					U		U	
	Broad-2					U		U	
	Uni-3						G	G	
	Multi-3						G	G	
	Broad-3						G	G	
	Uni-4	U							B
	Multi-4	U							B
	Broad-4	U							B
	Uni-5		U						U
	Multi-5		U						U
	Broad-5		U						U
	Uni-6			G					G
	Multi-6			G					G
	Broad-6			G					G

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**				U (SVL/IVL)			B (SVL/IVL)	
	D5-1				U (IVL)			B (SVL/IVL)	
	D6-1				U (IVL)			B (SVL/IVL)	
	D4-2					U (IVL)		U (SVL/IVL)	
	D5-2					U (SVL/IVL)		U (SVL/IVL)	
	D6-2					U (IVL)		U (SVL/IVL)	
	D4-3						G (IVL)	G (SVL/IVL)	
	D5-3						G (IVL)	G (SVL/IVL)	
	D6-3						G (SVL/IVL)	G (SVL/IVL)	
	D1-4	U (SVL/IVL)							B (SVL/IVL)
	D2-4	U (IVL)							B (SVL/IVL)
	D3-4	U (IVL)							B (SVL/IVL)
	D1-5		U (IVL)						U (SVL/IVL)
	D2-5		U (SVL/IVL)						U (SVL/IVL)
	D3-5		U (IVL)						U (SVL/IVL)
	D1-6			G (IVL)					G (SVL/IVL)
	D2-6			G (IVL)					G (SVL/IVL)
	D3-6			G (SVL/IVL)					G (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None

VLAN.io.3.3 : Red/Green Trunk, Blue Access Link

Purpose: Determine whether the DUT and BP properly exchange frames originating from end stations in the Red, Blue, and Green VLANs when the DUT and BP are connected via a Red and Green Trunk, Blue Access Link.

References:

- IEEE Std. 802.1Q-2003: sub-clause 5.1
- IEEE Std. 802.1Q-2003: Annex D

Resource Requirements:

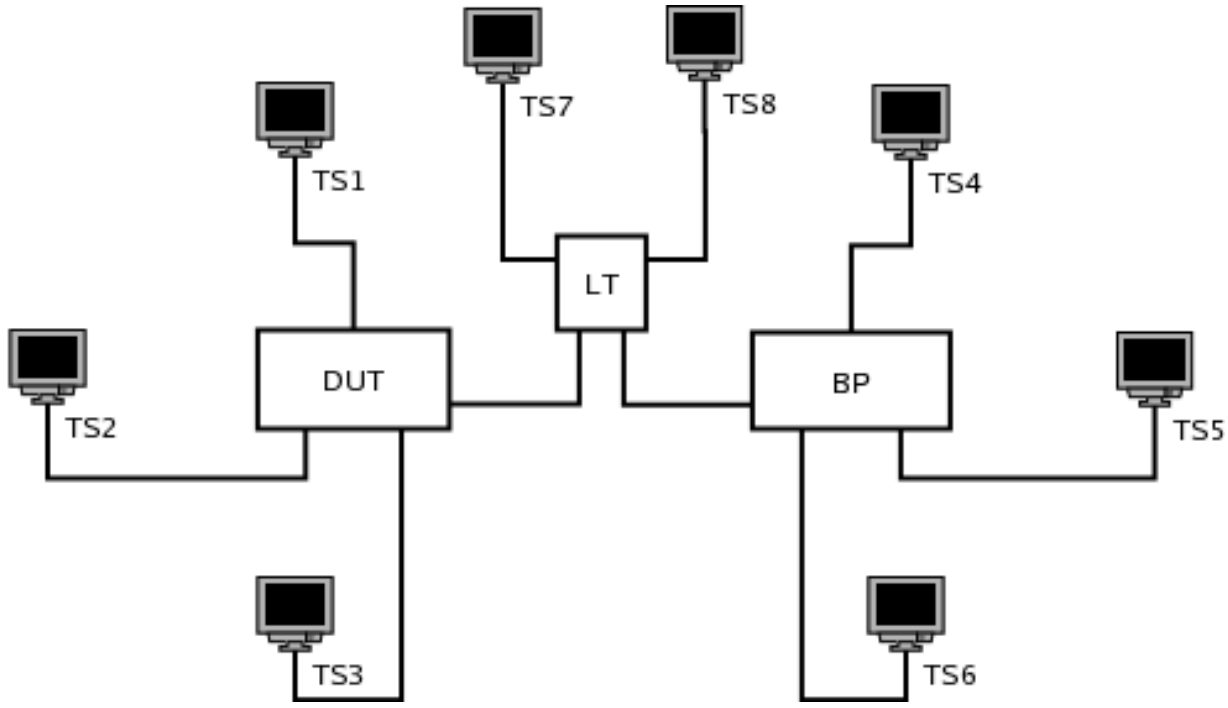
- 8 Test Stations
- 1 Line Tap

Discussion:

The logical partitioning of a Bridged LAN into multiple broadcast domains (achieved using VLANs) provides needed management functionality. However, testing is needed to ensure that each frame is properly classified and that frames are not forwarded onto any VLAN with which they have not been classified. Testing is also necessary to ensure that frames reach their destination (when appropriate) in Bridged LANs composed of multiple VLAN-aware Bridges that have partitioned the network into multiple VLANs.

Please note that this test is an interoperability test. Therefore, failure against any one device does not necessarily indicate nonconformance. Rather, it indicates that the two devices are unable to work "properly" together and that more testing is needed to isolate the cause of the failure.

Test Layout:



Procedure:

Part A: DUT and BP Connected via Red/Green Trunk, Blue Access Link

1. Ensure that the default test setup is configured.
2. Set Port DUT.LT's PVID to Blue.
3. Set Port BP.LT's PVID to Blue.
4. Add Port DUT.LT to the Untagged Set for the Blue VLAN.
5. Add Port DUT.LT to the Member Set for the Red VLAN.
6. Add Port DUT.LT to the Member Set for the Green VLAN.
7. Add Port BP.LT to the Untagged Set for the Blue VLAN.
8. Add Port BP.LT to the Member Set for the Red VLAN.
9. Add Port BP.LT to the Member Set for the Green VLAN.
10. Start capture on Test Stations 1-8
11. Transmit, from Test Station 1, 10 Uni-1, 10 Multi-1, and 10 Broad-1 frames.
12. Transmit, from Test Station 2, 10 Uni-2, 10 Multi-2, and 10 Broad-2 frames.
13. Transmit, from Test Station 3, 10 Uni-3, 10 Multi-3, and 10 Broad-3 frames.
14. Transmit, from Test Station 4, 10 Uni-4, 10 Multi-4, and 10 Broad-4 frames.
15. Transmit, from Test Station 5, 10 Uni-5, 10 Multi-5, and 10 Broad-5 frames.
16. Transmit, from Test Station 6, 10 Uni-6, 10 Multi-6, and 10 Broad-6 frames.
17. Wait 2 seconds.
18. Transmit, from Test Station 1, 10 D4-1, 10 D5-1, and 10 D6-1 frames.
19. Transmit, from Test Station 2, 10 D4-2, 10 D5-2, and 10 D6-2 frames.
20. Transmit, from Test Station 3, 10 D4-3, 10 D5-3, and 10 D6-3 frames.
21. Transmit, from Test Station 4, 10 D1-4, 10 D2-4, and 10 D3-4 frames.
22. Transmit, from Test Station 5, 10 D1-5, 10 D2-5, and 10 D3-5 frames.
23. Transmit, from Test Station 6, 10 D1-6, 10 D2-6, and 10 D3-6 frames.
24. Wait 2 seconds.
25. Stop capture on Test Stations 1-8 and observe the captured frames (if any).

Observable Results:

	Test Stations								
Frame Labels		**TS1**	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
	Uni-1				U			U	
	Multi-1				U			U	
	Broad-1				U			U	
	Uni-2					U		R	
	Multi-2					U		R	
	Broad-2					U		R	
	Uni-3						G	G	
	Multi-3						G	G	
	Broad-3						G	G	
	Uni-4	U							U
	Multi-4	U							U
	Broad-4	U							U
	Uni-5		U						R
	Multi-5		U						R
	Broad-5		U						R
	Uni-6			G					G
	Multi-6			G					G
	Broad-6			G					G

	Test Stations								
		TS1	**TS2**	**TS3**	**TS4**	**TS5**	**TS6**	**TS7**	**TS8**
Frame Labels	**D4-1**				U (SVL/IVL)			U (SVL/IVL)	
	D5-1				U (IVL)			U (SVL/IVL)	
	D6-1				U (IVL)			U (SVL/IVL)	
	D4-2					U (IVL)		R (SVL/IVL)	
	D5-2					U (SVL/IVL)		R (SVL/IVL)	
	D6-2					U (IVL)		R (SVL/IVL)	
	D4-3						G (IVL)	G (SVL/IVL)	
	D5-3						G (IVL)	G (SVL/IVL)	
	D6-3						G (SVL/IVL)	G (SVL/IVL)	
	D1-4	U (SVL/IVL)							U (SVL/IVL)
	D2-4	U (IVL)							U (SVL/IVL)
	D3-4	U (IVL)							U (SVL/IVL)
	D1-5		U (IVL)						R (SVL/IVL)
	D2-5		U (SVL/IVL)						R (SVL/IVL)
	D3-5		U (IVL)						R (SVL/IVL)
	D1-6			G (IVL)					G (SVL/IVL)
	D2-6			G (IVL)					G (SVL/IVL)
	D3-6			G (SVL/IVL)					G (SVL/IVL)

Note – SVL Bridges will produce different results than IVL Bridges. The results for SVL Bridges are denoted by SVL in parentheses under the frame type (U/B/R/G). The results for IVL Bridges are denoted by IVL in parentheses under the frame type (untagged/tagged). If the Test Station is connected to an SVL Bridge it must only capture frames denoted by (SVL). If the Test Station is connected to an IVL Bridge it must only capture frames denoted by (IVL).

Possible Problems:

- None