

**Ethernet Switching Protocols
Consortium
Multiple Spanning Tree Protocol
Conformance Test Suite**

Version 2.2



Last Updated: June 13, 2016

***Ethernet Switching Protocols Consortium
UNH InterOperability Laboratory***

***21 Madbury Rd Suite 100
Durham, NH 03824
Phone: +1-603-862-8005
Fax: +1-603-862-4181
www.iol.unh.edu***

Improving networks worldwide.

©2014 University of New Hampshire InterOperability Laboratory

Contents

Modification Record	4
Acknowledgements	5
Introduction	6
Abbreviations and Acronyms	7
Test Organization	8
MSTP Conformance Tests	9
Group 1: MST BPDUs Format and Processing	9
Test MSTP.op.1.1 Basic MST BPDUs Verification	10
Test MSTP.op.1.2 Protocol Identifier Verification	15
Test MSTP.op.1.3 Protocol Version Identifier Verification	16
Test MSTP.op.1.4 BPDUs Type Field Verification	17
Test MSTP.op.1.5 CIST Root/CIST Regional Root Identifier Field Verification	18
Test MSTP.op.1.6 Root Path Cost Field Verification	20
Test MSTP.op.1.7 Bridge Identifier Field Verification	22
Test MSTP.op.1.8 Port Identifier Field Verification	24
Test MSTP.op.1.9 Message Age Field Verification	26
Test MSTP.op.1.10 Max Age Field Verification	28
Test MSTP.op.1.11 Hello Time Field Verification	30
Test MSTP.op.1.12 Forward Delay Field Verification	31
Test MSTP.op.1.13 Large BPDUs Message Times	33
Test MSTP.op.1.14 BPDUs Length Verification	34
Test MSTP.op.1.15 Receive Identical MST BPDUs on Two Different Ports	35
Test MSTP.op.1.16 CIST Internal Path Cost Field Verification	36
Test MSTP.op.1.17 Erroneous Version 3 Length Field	38
Test MSTP.op.1.18 MSTI Regional Root Identifier Verification	39
Test MSTP.op.1.19 MSTI Priority Fields Verification	40
Test MSTP.op.1.20 MSTI Internal Root Path Cost Verification	41
Test MSTP.op.1.21 MSTI Remaining Hops Field Verification	42
Test MSTP.op.1.22 VLAN Tagged BPDUs	43
Group 2: RST BPDUs Format and Processing	44
Test MSTP.op.2.1 Basic RST BPDUs Verification	45
Test MSTP.op.2.2 Protocol Identifier Verification	47
Test MSTP.op.2.3 Protocol Version Identifier Verification	48
Test MSTP.op.2.4 BPDUs Type Field Verification	49
Test MSTP.op.2.5 CIST Root/CIST Regional Root Identifier Field Verification	50
Test MSTP.op.2.6 Root Path Cost Field Verification	52
Test MSTP.op.2.7 Bridge Identifier Field Verification	53
Test MSTP.op.2.8 Port Identifier Field Verification	54
Test MSTP.op.2.9 Message Age Field Verification	55
Test MSTP.op.2.10 Max Age Field Verification	57
Test MSTP.op.2.11 Hello Time Field Verification	58
Test MSTP.op.2.12 Forward Delay Field Verification	59
Test MSTP.op.2.13 Large BPDUs Message Times	61
Test MSTP.op.2.14 BPDUs Length Verification	62
Test MSTP.op.2.15 Receive Identical RST BPDUs On Two Different Ports	63
Test MSTP.op.2.16 VLAN Tagged BPDUs	64
Group 3: ST BPDUs Format and Processing	65
Test MSTP.op.3.1 Basic ST BPDUs Verification	66
Test MSTP.op.3.2 Protocol Identifier Verification	70

Test MSTP.op.3.3 Protocol Version Identifier Verification	71
Test MSTP.op.3.4 BPDU Type Field Verification	72
Test MSTP.op.3.5 BPDU Flags Field Verification	73
Test MSTP.op.3.6 Root Identifier Field Verification	75
Test MSTP.op.3.7 Root Path Cost Field Verification.	76
Test MSTP.op.3.8 Bridge Identifier Field Verification	77
Test MSTP.op.3.9 Port Identifier Field Verification.	78
Test MSTP.op.3.10 Message Age Field Verification	79
Test MSTP.op.3.11 Max Age Field Verification	81
Test MSTP.op.3.12 Hello Time Field Verification.	82
Test MSTP.op.3.13 Forward Delay Field Verification	83
Test MSTP.op.3.14 Large BPDU Message Times	84
Test MSTP.op.3.15 Length/Type Field Verification	85
Test MSTP.op.3.16 Receive Identical ST BPDUs On Two Different Ports	86
Test MSTP.op.3.17 VLAN Tagged BPDUs	87
Appendix A: Default Test Setup	88
Appendix B: Frame Document.	90

Modification Record

Version	Date	Editor(s)	Comments
0.1	2005-04-25	Charles Lavery	Test Suite Creation
0.2	2005-06-25	Charles Lavery Curtis Simonson	Added new tests
0.3	2005-11-01	Henry He Charles Lavery Curtis Simonson	Added new tests
0.4	2006-04-10	Charles Lavery	Added new tests
0.5	2006-07-01	Henry He Charles Lavery Curtis Simonson	Added new tests
0.6	2006-11-01	Henry He Curtis Simonson	Added new tests
0.7	2006-11-26	Henry He	Added new tests Editorial Correction
0.8	2006-12-18	Charles Lavery	Added new tests Technical Corrections Minor Formatting Changes
0.9	2007-01-09	Charles Lavery	Added MSTI tests Technical Corrections
0.9	2007-06-14	Charles Lavery	Technical and editorial corrections
0.95	2007-08-20	Charles Lavery	Consolidation and removal of Length/Type tests.
1.0	2008-02-07	Kari Younsi	Updated to reference 802.1Q-2005
1.1	2008-06-23	Timothy Davis	Updated to reference 802.1Q-2005
1.2	2008-10-30	Aaron Stewart	Technical Corrections Formatting Adjustments
1.3	2012-08-20	Jonathan Gulick	Updated to reference 802.1Q-2011
2.0	2014-08-14	Christina Dube Greg Roney Jon Gulick Max Renke Pat Lee James Coughlin Steve Giguere	Updated in accordance with changes de- fined in IEEE Std. 802.1Q-2011.
2.1	2015-03-26	Steven Giguere	Small updates to minor errors in grammar.
2.2	2016-04-27	Patrick Lee Maxwell Renke Tim Sheehan	Technical Corrections Updated/Removed Tests Added Frames Document

Acknowledgements

The UNH InterOperability Lab acknowledges the efforts of the following individuals in the development of this test suite:

Henry He
Charles Lavery
Curtis Simonson

UNH InterOperability Laboratory
UNH InterOperability Laboratory
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 Multiple Spanning Tree capable products.

This test suite has been designed based on the set of requirements (expressed in state machine diagrams, tables, and text) defined in IEEE Std 802.1Q™-2011, that pertain to MSTP. 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 are not designed to evaluate performance. The relative performance of MSTP capable devices (e.g. bridge configuration time, device startup time, etc.) is beyond the scope of this document.

The purpose of standardized protocols and features is to provide a uniform set of requirements that are met by all implementations. Satisfactory completion of conformance testing helps to instill confidence in users that the implementation will be well-behaved in a live network. Non-conformant implementations of standards-based protocols and features can lead to broken networks, reduced connectivity, network loops, or other unintended behaviors, as well as confused or frustrated end-users. This test suite aims to provide one method of verifying conformance to IEEE Std. 802.1Q-2011. Successful completion of all tests contained in this suite cannot guarantee that the tested device will operate as desired in all possible environments. However, combined with satisfactory completion of interoperability testing and companion test suites, these tests provide a reasonable level of confidence that the DUT will function well in most Multiple Spanning Tree capable environments.

Abbreviations and Acronyms

IEEE 802.1

BPDU	Bridge Protocol Data Unit
CIST	Common Internal Spanning Tree
CST	Common Spanning Tree
FCS	Frame Check Sequence(a.k.a Cyclic Redundancy Check)
IST	Internal Spanning Tree
LAN	Local Area Network
MAC	Media Access Control
MCID	MST Configuration Identifier
MST	Multiple Spanning Tree
MST BPDU	Multiple Spanning Tree Bridge Protocol Data Unit
MSTI	Multiple Spanning Tree Instance
MSTP	Multiple Spanning Tree Protocol
PDU	Protocol Data Unit
PVID	Port VID
RST	Rapid Spanning Tree
RST BPDU	Rapid Spanning Tree Bridge Protocol Data Unit
RSTP	Rapid Spanning Tree Protocol
ST	Spanning Tree
ST BPDU	Spanning Tree Bridge Protocol Data Unit
STP	Spanning Tree Protocol
TCN BPDU	Topology Change Notification BPDU
VID	VLAN Identifier
VLAN	Virtual LAN

MSTP Operations Test Suite

DUT	Device Under Test
DUT.TS	Port on the DUT connected to Test Station (ex.DUT.TS1 refers to the Port on the DUT connected to Test Station 1)
TS	Test Station (ex. TS1 refers to Test Station 1)

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 constitute 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
Purpose:	The Purpose is a brief statement outlining 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.
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 Setup:	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. <i>***Configurations are cleared at the end of each Test***</i>
Test Procedure:	This section of the test description contains the step-by-step instructions for carrying out the test. These steps includesuch 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 withthe observable results given for that test part. <i>***Continuously transmitted frames are stopped at the end of each Test Part***</i> <i>***Unless noted, less than 0.1 seconds must elapse between execution of Test Steps***</i>
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.

Group 1: MST BPDU Format and Processing

Scope: To verify the DUT uses the proper frame format and parameter encoding for the MST BPDUs it transmits, and that the DUT properly validates the MST BPDUs it receives.

Test MSTP.op.1.1 — Basic MST BPDU Verification

Purpose: To verify that the DUT properly processes basic MST BPDUs with valid field values and transmits properly formatted MST BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [4] IEEE Std. 802.1Q-2011: sub-clause 14.6
[2] IEEE Std. 802.1Q-2011: sub-clause 13.27.27 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: sub-clause 14.4 [6] IEEE Std. 802.1Q-2011: Figure 14-2

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: IEEE Std 802.1Q-2011 Figures 14-1 and 14-2, in addition to sub-clause 14.6, specify the proper format and encoding of MST BPDUs. To ensure cross-vendor interoperability an MST Bridge must accept and process MST BPDUs meeting the basic validation requirements of IEEE Std. 802.1Q-2011 sub-clause 14.4. An MST Bridge shall transmit MST BPDUs on any Port that has not received an ST BPDU within 3 seconds (default Migrate Time value), as specified by the Port Protocol Migration state machine. The MST BPDU is designed to be processed by RST Bridges, regardless of the fact that it contains additional information beyond RST BPDU fields.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid BPDU Transmission

1. Ensure the DUT is configured to the test setup as defined above.
2. Wait until TS1 receives 1 MST BPDU.

Part B: Valid BPDU Transmission - Intra-Region BPDU

1. Ensure the DUT is configured to the test setup as defined above.
2. From TS1, transmit MST.IntraMakeRootPort frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Part C: Valid BPDU Transmission - Inter-Region BPDU

1. Ensure the DUT is configured to the test setup as defined above.
2. From TS1, transmit MST.InterMakeRootPort frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Part D: Valid BPDU Transmission - Worse Information

1. Ensure the DUT is configured to the test setup as defined above.
2. From TS1, transmit MST.WorseRootIDthanDUT frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 2, TS1 must capture a properly formatted MST BPDU containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x03
BPDU Type	0x02
CIST Flags	Designated Port and Forwarding(TS1)
CIST Root Identifier	DUT's CIST Root Identifier
CIST External Path Cost	0x00000000
CIST Regional Root Identifier	DUT's Regional Root Identifier
CIST Port Identifier	DUT.TS1's CIST Port Identifier
Message Age	0x0000
Max Age	0x14
Hello Time	0x02
Forward Delay	0x0F
Version 1 Length	0x00
CIST Internal Root Path Cost	0x00000000
CIST Bridge Identifier	DUT's CIST Bridge Identifier
CIST Remaining Hops	0x14
MSTI 1 Flags	Designated Port and Forwarding(TS1)
MSTI 1 Regional Root Identifier	DUT's MSTID 1 Bridge Identifier
MSTI 1 Internal Root Path Cost	0x00000000
MSTI 1 Bridge Identifier Priority	0x9000
MSTI 1 Port Identifier Priority	0x80
MSTI 1 Remaining Hops	0x14
MSTI 2 Flags	Designated Port and Forwarding(TS1)
MSTI 2 Regional Root Identifier	DUT's MSTID 2 Bridge Identifier
MSTI 2 Internal Root Path Cost	0x00000000
MSTI 2 Bridge Identifier Priority	0xA0
MSTI 2 Port Identifier Priority	0x80
MSTI 2 Remaining Hops	0x14

Part B:

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x03
BPDU Type	0x02
CIST Flags	Designated Port and Forwarding(TS2) Designated Port and Forwarding(TS3)
CIST Root Identifier	CIST Root Identifier contained in MST.IntraMakeRootPort
CIST External Path Cost	CIST External Path Cost contained in MST.IntraMakeRootPort
CIST Regional Root Identifier	CIST Regional Root Identifier contained in MST.IntraMakeRootPort
CIST Port Identifier	DUT.TS2 and DUT.TS3's CIST Port Identifier, respectively
Message Age	Message Age contained in MST.IntraMakeRootPort
Max Age	Max Age contained in MST.IntraMakeRootPort
Hello Time	DUT.TS2 and DUT.TS3's Port Hello Time, respectively
Forward Delay	Forward Delay contained in MST.IntraMakeRootPort
Version 1 Length	0x00
CIST Internal Root Path Cost	Internal Root Path Cost contained in MST.IntraMakeRootPort + DUT.TS1's Port Path Cost
CIST Bridge Identifier	DUT's CIST Bridge Identifier
CIST Remaining Hops	Remaining Hops contained in MST.IntraMakeRootPort - 1
MSTI 1 Flags	Designated Port and Discarding(TS2) Designated Port and Forwarding(TS3)
MSTI 1 Regional Root Identifier	DUT's MSTID 1 Bridge Identifier
MSTI 1 Internal Root Path Cost	0x00000000
MSTI 1 Bridge Identifier Priority	0x9000
MSTI 1 Port Identifier Priority	0x80
MSTI 1 Remaining Hops	0x14
MSTI 2 Flags	Designated Port and Discarding(TS2) Designated Port and Forwarding(TS3)
MSTI 2 Regional Root Identifier	DUT's MSTID 2 Bridge Identifier
MSTI 2 Internal Root Path Cost	0x00000000
MSTI 2 Bridge Identifier Priority	0xA0
MSTI 2 Port Identifier Priority	0x80
MSTI 2 Remaining Hops	0x14

Part C:

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x03
BPDU Type	0x02
CIST Flags	Designated Port and Forwarding(TS2) Designated Port and Forwarding(TS3)
CIST Root Identifier	CIST Root Identifier contained in MST.InterMakeRootPort
CIST External Path Cost	CIST External Path Cost contained in MST.InterMakeRootPort + DUT.TS1's Port Path Cost
CIST Regional Root Identifier	DUT's CIST Bridge Identifier
CIST Port Identifier	DUT.TS2 and DUT.TS3's CIST Port Identifier, respectively
Message Age	Message Age contained in MST.InterMakeRootPort + 1 second
Max Age	Max Age contained in MST.InterMakeRootPort
Hello Time	DUT.TS2 and DUT.TS3's Port Hello Time, respectively
Forward Delay	Forward Delay contained in MST.InterMakeRootPort
Version 1 Length	0x00
CIST Internal Root Path Cost	0x00000000
CIST Bridge Identifier	DUT's CIST Bridge Identifier
CIST Remaining Hops	0x14
MSTI 1 Flags	Designated Port and Discarding(TS2) Designated Port and Forwarding(TS3)
MSTI 1 Regional Root Identifier	DUT's MSTID 1 Bridge Identifier
MSTI 1 Internal Root Path Cost	0x00000000
MSTI 1 Bridge Identifier Priority	0x9000
MSTI 1 Port Identifier Priority	0x80
MSTI 1 Remaining Hops	0x14
MSTI 2 Flags	Designated Port and Discarding(TS2) Designated Port and Forwarding(TS3)
MSTI 2 Regional Root Identifier	DUT's MSTID 2 Bridge Identifier
MSTI 2 Internal Root Path Cost	0x00000000
MSTI 2 Bridge Identifier Priority	0xA0
MSTI 2 Port Identifier Priority	0x80
MSTI 2 Remaining Hops	0x14

Part D:

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x03
BPDU Type	0x02
CIST Flags	Designated Port and Forwarding(TS2) Designated Port and Forwarding(TS3)
CIST Root Identifier	DUT's CIST Bridge Identifier
CIST External Path Cost	0x00000000
CIST Regional Root Identifier	DUT's CIST Bridge Identifier
CIST Port Identifier	DUT.TS2 and DUT.TS3's CIST Port Identifier, respectively
Message Age	0x0000
Max Age	DUT's Max Age
Hello Time	DUT.TS2 and DUT.TS3's Port Hello Time, respectively
Forward Delay	DUT's Forward Delay
Version 1 Length	0x00
CIST Internal Root Path Cost	0x00000000
CIST Bridge Identifier	DUT's CIST Bridge Identifier
CIST Remaining Hops	0x14
MSTI 1 Flags	Designated Port and Discarding(TS2) Designated Port and Forwarding(TS3)
MSTI 1 Regional Root Identifier	DUT's MSTID 1 Bridge Identifier
MSTI 1 Internal Root Path Cost	0x00000000
MSTI 1 Bridge Identifier Priority	0x9000
MSTI 1 Port Identifier Priority	0x80
MSTI 1 Remaining Hops	0x14
MSTI 2 Flags	Designated Port and Discarding(TS2) Designated Port and Forwarding(TS3)
MSTI 2 Regional Root Identifier	DUT's MSTID 1 Bridge Identifier
MSTI 2 Internal Root Path Cost	0x00000000
MSTI 2 Bridge Identifier Priority	0xA0
MSTI 2 Port Identifier Priority	0x80
MSTI 2 Remaining Hops	0x14

Possible Problems: None.

Test MSTP.op.1.2 — Protocol Identifier Verification

Purpose: To verify that the DUT only processes MST BPDUs with a Protocol Identifier equal to 0x0000.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 8.13.3 [3] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.4 [4] IEEE Std. 802.1Q-2011: Figure 14-2

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Bridge Group Address, 01:80:C2:00:00:00, and the LLC address that specifies the Bridge Protocol Entity, 0x42, may be used for any number of protocols. For this reason a Protocol Identifier specifying the Spanning Tree Protocol is contained in all BPDUs used by any version of the Spanning Tree Protocol.

This Protocol Identifier is used when determining whether a BPDU is valid. The Protocol Identifier must be 0x0000 or the BPDU will be determined invalid.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Invalid Protocol Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortBadProtoID1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4 using MST.MakeRootPortBadProtoID2 in step 2.
6. Repeat steps 2 through 4 using MST.MakeRootPortBadProtoID3 in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.1.3 — Protocol Version Identifier Verification

Purpose: To verify that the DUT processes MST BPDUs containing varying Protocol Version Identifier values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 14.4 [3] IEEE Std. 802.1Q-2011: Figure 14-2
[2] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Protocol Version Identifier is encoded in the third octet of an MST BPDU. A compliant device must not validate an MST BPDU based on the value encoded in the Protocol Version Identifier field. This allows future versions of the Spanning Tree Protocol to use this field while providing support for legacy versions. For MSTP, the Protocol Version Identifier is 0x03.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Future Protocol Version Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortBadProtoVerID1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4 using MST.MakeRootPortBadProtoVerID2 in step 2.
6. Repeat steps 2 through 4 using MST.MakeRootPortBadProtoVerID3 in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.1.4 — BPDU Type Field Verification

Purpose: To verify that the DUT does not process MST BPDUs containing invalid BPDU Type values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 14.4 [3] IEEE Std. 802.1Q-2011: Figure 14-2
[2] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Each version of STP defines one or more valid BPDU types, encoded in the fourth octet of transmitted BPDUs. For Protocol Version 0x03 of STP the BPDU Type field is encoded with a value equal to 0x02. For Protocol Version 0x02, any other value in the BPDU Type field denotes an invalid BPDU Type and must not be processed.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Invalid BPDU Types

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortBadBPDUType1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4 using MST.MakeRootPortBadBPDUType2 in step 2.
6. Repeat steps 2 through 4 using MST.MakeRootPortBadBPDUType3 in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.1.5 — CIST Root/CIST Regional Root Identifier Field Verification

Purpose: To verify that the DUT processes MST BPDUs with varying CIST Root Identifier, CIST External Path Cost and CIST Regional Root Identifier field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 14.4 [3] IEEE Std. 802.1Q-2011: Figure 14-2
[2] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The CIST Root Identifier contained in MST BPDUs transmitted by an MST Bridge is a result of the CIST Priority Vector Calculation process. If an MST Bridge has not received a BPDU from a Bridge within the Region it participates in containing a CIST Root Identifier better than the Bridge's CIST Bridge Identifier, then the Bridge considers itself the CIST Regional Root. Otherwise, the Bridge will appoint the Port receiving the best CIST Internal Path Cost as the CIST Root Port. If an MST Bridge that is the CIST Regional Root has not received a BPDU from outside the Region it participates in containing a CIST Root Identifier (MST BPDUs), or Root Bridge Identifier (ST BPDUs), better than the Bridge's CIST Bridge Identifier, then it will consider itself the CIST Root Bridge. Otherwise, the Bridge will appoint the Port receiving the best CIST Root Identifier as the CIST Root Port.

The Bridge Identifier or Root Bridge Identifier, or CIST Root Identifier, is the concatenation of a 2-byte Bridge Priority and a 6-byte Bridge MAC address. MST Bridges allow Bridge Priority value configuration of only the four most significant bits, thereby supporting a range of Bridge Priority values from 0 to 61440, in increments of 4096. However, IEEE Std 802.1D-1998 ST Bridges allow Bridge Priority value configuration to any value between 0 and 65535. Therefore, MST Bridges must support processing a full range of Bridge Priority values.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: MST BPDU CIST Root Identifier Verification - Priority Portion - Intra Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraRootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraRootID0001_000000000000 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using MST.IntraRootID7776_777777777777 and MST.IntraRootID7777_777777777777 in steps 2 and 4, respectively.

Part B: MST BPDU CIST Root Identifier Verification - MAC Address Portion - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraRootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraRootID0000_000000000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using MST.IntraRootID7777_777777777776 and MST.IntraRootID7777_777777777777 in steps 2 and 4, respectively.

Part C: MST BPDU CIST Root Identifier Verification - Priority Portion - Inter-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.InterRootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterRootID0001_000000000000 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using MST.InterRootID7776_777777777777 and MST.InterRootID7777_777777777777 in steps 2 and 4, respectively.

Part D: MST BPDU CIST Root Identifier Verification - MAC Address Portion - Inter-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.InterRootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterRootID0000_000000000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using MST.InterRootID7777_777777777776 and MST.InterRootID7777_777777777777 in steps 2 and 4, respectively.

Observable Results:

Parts A through D:

- In step 5 and each repetition of step 5, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.1.6 — Root Path Cost Field Verification

Purpose: To verify that the DUT processes MST BPDUs with varying Root Path Cost field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.4.1 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 13.8 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: Table 13-4 [6] IEEE Std. 802.1Q-2011: Figure 14-2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The External Root Path Cost for an MST Bridge is the cost of the CIST network path from the Root Port of the MST Regional Root Bridge to the CIST Root Bridge. The External Root Path Cost is not modified within an MST Region; therefore, the CIST External Path Cost value on all MST Bridges within an MST Region is equal. The CIST External Path Cost value is transmitted in BPDUs and may be used to determine the active topology. An MST Bridge encodes the CIST External Path Cost in the Root Path Cost field of ST BPDUs and the CIST External Path Cost field of MST BPDUs.

The following are true of External Path Cost:

- The CIST External Path Cost for the CIST Root Bridge is zero.
- The CIST External Path Cost for all other Bridges is the sum of the ExtRootPathCost portion of the Root Port's port priority vector and Path Cost parameter value configured on the CIST Root Port.
- The External Root Path Cost for an MST Bridge is the cost of the CIST network path from the Root Port of the MST Regional Root Bridge to the CIST Root Bridge.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Root Path Cost - Intra-Region BPDUs - MST sourced

1. Ensure that the DUT is configured to the test setup as defined above.
2. From TS1, transmit MST.IntraCISTRootPath00000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraCISTRootPath00000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using a Root Path Cost of 200000 and 200001 in steps 2 and 4, respectively
7. Repeat steps 2 through 5 using a Root Path Cost of 20000000 and 20000001 in steps 2 and 4, respectively

Part B: Root Path Cost - Inter-Region BPDUs - MST sourced

1. Ensure that the DUT is configured to the test setup as defined above.
2. From TS1, transmit MST.InterCISTRootPath00000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterCISTRootPath00000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using a Root Path Cost of 200000 and 200001 in steps 2 and 4, respectively
7. Repeat steps 2 through 5 using a Root Path Cost of 20000000 and 20000001 in steps 2 and 4, respectively

Part C: Root Path Cost equal to 0xFFFFFFF - Inter-Region BPDUs - MST sourced - Informational

1. Ensure that the DUT is configured to the test setup as defined above.
2. From TS1, transmit MST.InterCISTRootPathFFFFFFF frames one every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterCISTRootPathFFFFFFF frames every two seconds.
5. Wait 2 seconds.

Part D: Configuration of Invalid Port Path Cost values

1. Ensure that the DUT is configured to the test setup as defined above.
2. Attempt to configure DUT.TS1's CIST Path Cost to 0xBEBC201 (200,000,001).
3. Attempt to configure DUT.TS1's CIST Path Cost to 0xFFFFFFFF (4,294,967,295).

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier and a External Root Path Cost equal to that in frames transmitted by TS1.

Part B:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with an External Root Path Cost equal to that in frames transmitted by TS1 frame plus DUT.TS1's Port Path Cost.

Part C:

- In step 5, record the behavior of the DUT with respect to External Root Path Cost.

Part D:

- In steps 2 and 3, the DUT must not allow the attempted configurations.
- In steps 2 and 3, TS1 must capture MST BPDUs with an External Root Path Cost of 200,000.

Possible Problems: None.

Test MSTP.op.1.7 — Bridge Identifier Field Verification

Purpose: To verify that the DUT processes MST BPDUs with varying CIST Bridge Identifier field values and properly determines the CIST Root Port based on Bridge Identifier.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.4.1 [4] IEEE Std. 802.1Q-2011: Figure 13-28
[2] IEEE Std. 802.1Q-2011: sub-clause 13.24.1 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: sub-clause 14.4 [6] IEEE Std. 802.1Q-2011: Figure 14-2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: MST BPDUs contain a CIST Bridge Identifier field consisting of the concatenation of a 2-byte Bridge Priority and a 6-byte Bridge MAC address. RST and MST Bridges allow Bridge Priority value configuration of only the four most significant bits, thereby supporting a range of Bridge Priority values from 0 to 61440, in increments of 4096. However, IEEE Std 802.1D-1998 ST Bridges support Bridge Priority value configuration of any value between 0 and 65535. Therefore, MST Bridges must support processing of a full range of Bridge Priority values. The 6-byte Bridge MAC address component of the CIST Bridge Identifier ensures that the Bridge will be distinguished from all other Bridges on the LAN. Generally, the Bridge MAC address is the MAC address of the Bridge STP entity, and is different than the MAC address(es) of the Bridge Port(s). The CIST Bridge Identifier contained in an MST BPDU is always equal to the CIST Bridge Identifier of the transmitting Bridge.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Priority portion of the Bridge Identifier - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraCISTBridgeID7776_7777777777 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraCISTBridgeID7777_7777777777 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.IntraCISTBridgeIDFFFE_FFFFFFFF and MST.IntraCISTBridgeIDFFFF_FFFFFFFF in steps 2 and 4, respectively.

Part B: MAC Address portion of the Bridge Identifier - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraCISTBridgeID7777_7777777776 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames two seconds.
4. From TS3, transmit MST.IntraCISTBridgeID7777_7777777777 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.IntraCISTBridgeIDFFFF_FFFFFFFF and MST.IntraCISTBridgeIDFFFF_FFFFFFFF in steps 2 and 4, respectively.

Part C: Priority Portion of the Bridge Identifier - Inter-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.InterCISTBridgeID7776_7777777777 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterCISTBridgeID7777_7777777777 frames every two seconds.
5. Wait 2 seconds.

Part D: MAC Address portion of the Bridge Identifier - Inter-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.InterCISTBridgeID_7777_7777777776 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterCISTBridgeID_7777_7777777777 frames every two seconds.
5. Wait 2 seconds.

Part E: Configuration of Valid CIST Bridge Priority values

1. Ensure that the Default Test Values are configured on the DUT.
2. Configure DUT's CIST Bridge Priority to 0xF000.
3. Wait 2 seconds.
4. Repeat steps 2 through 3, using the following CIST Bridge Priority values: 0xA000, 0x6000, 0x3000, 0x0000.

Part F: Configuration of Invalid CIST Bridge Priority values

1. Ensure that the Default Test Values are configured on the DUT.
2. Configure DUT's CIST Bridge Priority to 0x0001.
3. Wait 2 seconds.
4. Repeat steps 2 through 3, using the following CIST Bridge Priority values: 0x7999, 0x8100, 0xFFFF.

Observable Results:

Parts A and B:

- In step 5 and each repetition of step 5, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with CIST Regional Root Identifier equal to that in frames transmitted by TS1.

Parts C and D:

- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part E:

- In step 3 and each repetition of step 3, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier that has a priority value equal to the current set value.

Part F:

- In step 3 and each repetition of step 3, the DUT must not allow any of the attempted configurations and must capture a properly formatted MST BPDU with a CIST Root Identifier that has a priority value equal to 0x8000.
- In step 3 and each repetition of step 3, all test stations must capture BPDUs with a Bridge Identifier equal to the Bridge Identifier of the DUT.

Possible Problems: None.

Test MSTP.op.1.8 — Port Identifier Field Verification

Purpose: To verify that the DUT processes MST BPDUs with varying Port Identifier field values, and to determine if the DUT properly configures the Port Identifier field through management.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 12.3 [4] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 13.27.27

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: IEEE 802.1Q-2011 ST BPDUs, RST BPDUs and MST BPDUs contain a Port Identifier field consisting of the concatenation of the four most significant bits of the Port Priority value and a 12-bit Port Number value.

The CIST Port Identifier distinguishes the Port from all other Ports on the Bridge and allows the network administrator one additional method to administratively control selection of the Root and Root Port. It may be used as a tiebreaker when two Bridges are directly connected with more than one link, and when a Bridge is directly connected to itself. The CIST Port Identifier contained in a BPDU is always that of the Port from which it was transmitted.

xST Bridge Version	802.1D-1998	802.1D-2004	802.1Q-2011
Required Port Number Range	1 - 255	1 - 4095	1 - 4095
Required Port Priority Range	0 -255	0 - 240*	0 - 240*

* = *Increments of 16*

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: CIST Port Identifier Values

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.PortID0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.PortID0001 frames every two seconds.
5. Wait 2 seconds.

Part B: Configuration of Valid Port Priority Values

1. Ensure that the Default Test Values are configured on the DUT.
2. Configure the CIST Port Priorities on DUT.TS1 to 0x00, DUT.TS2 to 0x20, and DUT.TS3 to 0x50.
3. Wait 2 seconds.
4. Repeat steps 2 and 3 using a CIST Port Priority values equal to 0x60, 0x70, and 0x90.
5. Repeat steps 2 and 3 using a CIST Port Priority values equal to 0xA0, 0xD0, and 0xFF.

Part C: Configuration of invalid Port Priority values

1. Ensure that the Default Test Values are configured on the DUT.
2. Configure the CIST Port Priorities on DUT.TS1 to 0x01, DUT.TS2 to 0x23, and DUT.TS3 to 0x55.
3. Wait 2 seconds.
4. Repeat steps 2 and 3 using a CIST Port Priority value equal to 0x68, 0x89, and 0x98, in step 2.
5. Repeat steps 2 and 3 using a CIST Port Priority value equal to 0xAA, 0xDC, and 0xFF, in step 2.

Observable Results:

Part A:

- In step 5, DUT.TS1 must be in the Root Port role.
- In step 5, TS2 and TS4 must receive MST BPDUs with a Root Identifier equal to the Root Identifier sent by TS1.

Part B:

- In step 2 and each repetition of step 2, the DUT must allow all of the attempted configurations.
- In step 3 and each repetition of step 3, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with Port Identifier equal to the Port Identifier configured on each port.

Part C:

- In step 2 and each repetition of step 2, the DUT must not allow any of the attempted configurations.
- In step 3 and each repetition of step 3, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with Port Identifier equal to 0x80.

Possible Problems: None.

Test MSTP.op.1.9 — Message Age Field Verification

Purpose: To verify that the DUT does not process a Spanning Tree BPDU if its Message Age component is greater than or equal to its Max Age component.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [4] IEEE Std. 802.1Q-2011: sub-clause 13.27.30
[2] IEEE Std. 802.1Q-2011: sub-clause 13.27.22 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: sub-clause 13.27.24 [6] IEEE Std. 802.1Q-2011: Figure 14-2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Message Age field represents a decimal number of seconds encoded in hex. The first byte of the Message Age field represents integer seconds in the range 0 to 255. The Message Age field marks the age of the CIST information contained in an MST BPDU relative to the information's origination at the CIST Root Bridge. When a Port receives an MST BPDU containing better information than that which is currently held for the Port, the information is recorded, and the Port's Message Age Timer is set to the Message Age contained in the received MST BPDU. Then Message Age Timer is started - it will increment at regular intervals until new or same information is received or Message Age Timer Expiry occurs.

When an MST Bridge is the CIST Root, it transmits MST BPDUs containing a Message Age of zero. MST Bridges that are the CIST Regional Root transmit MST BPDUs containing a Message Age value equal to the current value of the Message Age Timer for the CIST Root Port of the MST Region it participates in incremented by 1. MST Bridges that are not the CIST Regional Root transmit MST BPDUs containing a Message Age value equal to the Message Age Timer of the Bridge's CIST Root Port. MST BPDUs containing a Message Age that is greater than or equal to their Max Age are immediately aged by the updRcvdInfoWhile() procedure.

xST Bridge Version	802.1D-1998	802.1D-2004	802.1Q-2011
Message Age Increment Range	1 - 4	1	1
Recommended Message Age Increment	1	1	1

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Various Message Age Values - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMessageAge_0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraMessageAge_0001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.IntraMessageAge_1200 and MST.IntraMessageAge_1201 in steps 2 and 4, respectively.

Part B: Valid Message Age Value near DUT's Max Age - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMessageAge_1300 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraMessageAge_1301 frames every two seconds.
5. Wait 2 seconds.

Part C: Valid Message Age Value > DUT's Max Age - Inter-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.InterMessageAge_2000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterMessageAge_2001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.InterMessageAge_FFFE and MST.InterMessageAge_FFFF in steps 2 and 4, respectively.

Part D: BPDU Containing Message Age Value = BPDU's Max Age Value - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMessageAge_1400 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Message Age equal to that in frames transmitted by TS1.
- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to that in frames transmitted in TS1.

Part B:

- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Message Age equal to that in frames transmitted by TS1.
- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to that in frames transmitted by TS1.

Part C:

- In step 5 and each repetition of step 5, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with Message Age equal to 0x0000.
- In step 5 and each repetition of step 5, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Part D:

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU with Message Age equal to 0x0000.
- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.1.10 — Max Age Field Verification

Purpose: To verify that the DUT only accepts MST BPDUs containing a valid Max Age value greater than the Message Age value and that the Max Age value is properly encoded in MST BPDUs transmitted by the DUT.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.14 [4] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: Table 13-5 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 14.6

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Max Age field represents a decimal number of seconds encoded in hex. The first byte of the Max Age field represents integer seconds in the range 0 to 255; the second byte represents the decimal value in seconds in the range 0 to 255/256 in increments of 1/256.

The Max Age field provides all xST Bridge a value with which to determine if received information is valid or too old. The age of information contained in an xST BPDU is increased at each hop from the information's origination at the Root Bridge. Information that transverse more hops than desired by the network administrator will be considered old, as the xST BPDU will contain a Message Age value greater than, or equal to, the Max Age value.

When an MST Bridge is the Root, it transmits xST BPDUs containing a Message Age value equal to zero and a Max Age value equal to the Bridge's configured Max Age value. Non-Root MST Bridges transmit xST BPDUs containing a Message Age value equal to the current value of the Message Age Timer for the CIST Root Port on the MST Region incremented by a value greater than zero plus any transmission delay, but less than the maximum allowed Message Age Increment Overestimate, and a Max Age value equal to the Max Age value received in xST BPDUs on the Bridge's Root Port. xST BPDUs containing a Message Age that is greater than or equal to their Max Age are immediately aged by the `updtRcvdInfoWhile()` procedure.

In order to interoperate with earlier versions of IEEE 802.1Q and IEEE 802.1D, a bridge must enforce the following: $2 \times (\text{Bridge_Forward_Delay} - 1.0 \text{ seconds}) \geq \text{Bridge_Max_Age} \geq 2 \times (\text{Bridge_Hello_Time} + 1.0 \text{ seconds})$

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: MST BPDU Containing Valid Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MaxAge_0600 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.MaxAge_0601 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.MaxAge_06FF and MST.MaxAge_0700 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using MST.MaxAge_2800 and MST.MaxAge_2801 in steps 2 and 4, respectively.

Part B: MST BPDU Containing Invalid Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MaxAge_0500 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.MaxAge_0501 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.MaxAge_FFFE and MST.MaxAge_FFFF in steps 2 and 4, respectively.

Part C: Configuring Invalid Max Age Values

1. Ensure that the Default Test Values are configured on the DUT.
2. Attempt to configure a Max Age value of 3 seconds.
3. Repeat step 2 with a Max Age value of 5, 41, and 45 seconds.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Max Age equal to that in frames transmitted by TS1.

Part B:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Max Age equal to that in frames transmitted by TS1.

Part C:

- The DUT must never allow any configuration with the above values to take place.

Possible Problems: None.

Test MSTP.op.1.11 — Hello Time Field Verification

Purpose: To verify that the DUT properly processes MST BPDUs containing various Hello Time values and does not propagate the Hello Time contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: Table 13-5 [4] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.3 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Hello Time is used when transmitting BPDUs. A BPDU is transmitted in each Hello Time period.

Table 13-5 in IEEE Std. 802.1Q-2011 states that the Bridge Hello Time parameter is fixed at 2 seconds.

In order to interoperate with earlier versions of IEEE 802.1Q and IEEE 802.1D, a bridge must enforce the following:
 $2 \times (\text{Bridge_Forward_Delay} - 1.0 \text{ seconds}) \geq \text{Bridge_Max_Age} \geq 2 \times (\text{Bridge_Hello_Time} + 1.0 \text{ seconds})$

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Hello Time Value Range:	1 - 10	2	2
Recommened Hello Time Value:	2	2	2

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Ensuring Bridge Hello Time

1. Ensure the DUT is configured to the test setup as defined above.
2. Wait 10 seconds.

Part B: Invalid Hello Time Values

1. Ensure the DUT is configured to the test setup as defined above.
2. Attempt to set the DUT's Bridge Hello Time parameter to 1 second.
3. Repeat step 2 with a Bridge Hello Time parameter of 3, 10, and 100 seconds.

Part C: DUT Does Not Propagate Invalid Hello Time from BPDUs

1. Ensure the DUT is configured to the test setup as defined above.
2. From TS1, transmit MST.MakeRootPortBigMsgTimes1 frames every second.
3. Wait 10 seconds.

Observable Results:

Part A:

- In step 2, TS1 must capture a MST BPDU containing a Bridge Hello Time value of 2 seconds and capture a BPDU once every 2 seconds.

Part B:

- In step 2 and each repetition of step 2, the DUT must not allow this configuration.
- TS1 must capture MST BPDUs with a Hello Time value of 2 seconds.

Part C:

- TS2 must capture MST BPDUs with a Hello Time value of 2 seconds and capture a BPDU once every 2 seconds

Possible Problems: None.

Test MSTP.op.1.12 — Forward Delay Field Verification

Purpose: To verify that the DUT properly processes MST BPDUs containing various Forward Delay values and propagates the Forward Delay contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: Table 13-5 [4] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.3 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Forward Delay is a Bridge-wide parameter that is conveyed in ST, RST and MST BPDUs to ensure that all Bridges in a Bridged LAN uses a consistent value for the Forward Delay Timer. Forward Delay determines the time spent in the listening and learning states.

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Forward Delay Value Range:	4 - 30	4 - 30	4 - 30
Recommended Forward Delay Value:	15	15	15

In order to interoperate with previous versions of IEEE Std. 802.1Q and 802.1D, a bridge must enforce the following:
 $2 \times (\text{Bridge_Forward_Delay} - 1.0 \text{ seconds}) \geq \text{Bridge_Max_Age} \geq 2 \times (\text{Bridge_Hello_Time} + 1.0 \text{ seconds})$

Part A of this test is applicable if and only if the DUT supports the modification of the Bridge Forward Delay parameter and the Bridge Max Age parameter

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid Forward Delay Value Configured

1. Ensure that the Default Test Values are configured on the DUT.
2. Configure the DUT's Bridge Max Age to 6 seconds.
3. Configure the DUT's Bridge Forward Delay to 4 seconds.
4. From TS1, transmit MST.WorseRootIDthanDUT frames every two seconds.
5. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
6. Wait 2 seconds.
7. Repeat steps 2 through 6, using 40 seconds and 30 seconds in steps 2 and 3, respectively.

Part B: Recommended Range Forward Delay Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.FwdDelay_0400 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.FwdDelay_0401 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using MST.FwdDelay_1DFF and MST.FwdDelay_1E00 in steps 2 and 4, respectively.

Part C: Large Forward Delay Value Propagation

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.FwdDelay_1E01 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.FwdDelay_1E02 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.FwdDelay_FFFE and MST.FwdDelay_FFFF in steps 2 and 4, respectively.

Part D: Configuring Invalid Forward Delay Values

1. Ensure that the Default Test Values are configured on the DUT.
2. Attempt to configure a Forward Delay value of 1 seconds.
3. Attempt to configure a Forward Delay value of 3 seconds.
4. Attempt to configure a Forward Delay value of 31 seconds.
5. Attempt to configure a Forward Delay value of 40 seconds.

Observable Results:

Part A:

- In step 6 and each repetition of step 6, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with Forward Delay equal the DUT's configured Forward Delay.

Parts B and C:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Forward Delay equal to that in frames transmitted from TS1.

Part D:

- The DUT must never allow any configuration with the above values to take place.

Possible Problems: None.

Test MSTP.op.1.13 — Large BPDU Message Times

Purpose: To verify that the DUT properly processes MST BPDUs containing large CIST message times and propagates the Max Age and Forward Delay values contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.23 [3] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: Table 13-5

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Spanning Tree, Rapid Spanning Tree, and Multiple Spanning Tree Bridges support a range of timer values (message times) and methods designed to age out old information in the Bridged LAN. Multiple Spanning Tree Bridges must support the ability to process each of the information ageing methods, and operate in a network consisting of many different information-ageing elements.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid Large Message Times

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortBigMsgTimes1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.MakeRootPortBigMsgTimes2 frames every two seconds.
5. Wait 10 seconds.

Observable Results:

Part A:

- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Max Age and Forward Delay equal to those in frames transmitted by TS1.
- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Hello Time equal to the Port Hello Time configured on DUT.TS2 and DUT.TS4 respectively.

Possible Problems: None.

Test MSTP.op.1.14 — BPDU Length Verification

Purpose: To verify that the DUT properly processes MST BPDUs containing various Length field values and propagates the information contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The requirements for validation of received BPDUs depend on BPDU type: ST BPDU, RST BPDU, MST BPDU, and TCN BPDU. A BPDU shall be considered invalid, and shall not be processed, if it does not contain the minimum number of octets specified for a particular BPDU type: 35, 36, 35 and 4, respectively. Additionally, a minimum BPDU size equal to 102 octets is defined for MST BPDUs. By default, all BPDUs transmitted in valid Ethernet frames must contain at least 48 octets between the Length field and the FCS. Therefore, all BPDUs transmitted in valid Ethernet frames satisfy the minimum BPDU size requirements.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Invalid BPDU Lengths

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortLength1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.WorseRootIDthanDUT frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.MakeRootPortLength2 frame in step 2.
7. Repeat steps 2 through 5, using MST.MakeRootPortLength3 frame in step 2.

Part B: Valid BPDU Lengths

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortBPDULength1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.WorseRootIDthanDUT frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using MST.MakeRootPortBPDULength2 frame in step 2.
7. Repeat steps 2 through 5, using MST.MakeRootPortBPDULength3 frame in step 2.
8. Repeat steps 2 through 5, using MST.MakeRootPortBPDULength4 frame in step 2.
9. Repeat steps 2 through 5, using MST.MakeRootPortBPDULength5 frame in step 2.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with the correct Length/Type field, and CIST Root Identifier equal to the CIST Bridge Identifier configured on the DUT.

Part B:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted from TS1.

Possible Problems: None.

Test MSTP.op.1.15 — Receive Identical MST BPDUs on Two Different Ports

Purpose: To verify that the DUT properly processes MST BPDUs when receiving identical BPDUs on two different Ports.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.5.3 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [5] IEEE Std. 802.1Q-2011: Figure 13-9
[3] IEEE Std. 802.1Q-2011: sub-clause 13.12

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: When a Bridge receives two identical MST BPDUs on two different Bridge Ports, it indicates there is a strong possibility of a network loop. To address this issue MST Bridges must place one of the two Ports in the Blocking State. The Port with a lesser CIST Port Identifier, must be placed in the Blocking State.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Receive Identical MST BPDUs On Two Different Ports. DUT Is Not Root.

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IdenticalBPDU1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IdenticalBPDU1 frames every two seconds.
5. Wait 2 seconds.

Part B: Receive Identical MST BPDUs On Two Different Ports. DUT Is Root.

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IdenticalBPDU2 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IdenticalBPDU2 frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Part A:

- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 5, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.1.16 — CIST Internal Path Cost Field Verification

Purpose: To verify that the DUT processes MST BPDUs with varying CIST Internal Path Cost field values and transmits properly formatted ST and MST BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.8 [3] IEEE Std. 802.1Q-2011: Table 13-4
[2] IEEE Std. 802.1Q-2011: sub-clause 13.16

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The CIST Internal Root Path Cost for an MST bridge is the cost of the CIST network path from the Root port of the MST Regional Root Bridge to the CIST Regional Root Bridge. The CIST Internal Root Path Cost field for all other bridges is the sum of the Internal Root Path Cost portion of the Root Port's port priority vector and the Path Cost parameter value configured on the CIST Regional Root Port.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Various CIST Internal Path Cost values - Intra-Region BPDUs

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraCISTIntPathCost_00000001 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraCISTIntPathCost_00000002 frames every two seconds.
5. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
6. Wait 2 seconds.
7. Repeat steps 2 through 6, using MST.IntraCISTIntPathCost_EEEEEEEE and MST.IntraCISTIntPathCost_EEEEEEEF in steps 2 and 4, respectively.

Part B: Overflow CIST Internal Path Cost - Informational

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraCISTIntPathCost_FFFFFFFE frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.IntraCISTIntPathCost_FFFFFFFF frames every two seconds.
5. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
6. Wait 2 seconds.

Part C: Various CIST Internal Path Cost values - Inter-Region BPDUs

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.InterCISTIntPathCost_00000001 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit MST.InterCISTIntPathCost_00000002 frames every two seconds.
5. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
6. Wait 2 seconds.
7. Repeat steps 2 through 6, using MST.InterCISTIntPathCost_EEEEEEEE and MST.InterCISTIntPathCost_EEEEEEEF in steps 2 and 4, respectively.
8. Repeat steps 2 through 6, using MST.InterCISTIntPathCost_FFFFFFFE and MST.InterCISTIntPathCost_FFFFFFFF in steps 2 and 4, respectively.

Observable Results:

Part A:

- In step 6 and each repetition of step 6, TS2 must capture a properly formatted MST BPDUs with an Internal Root Path Cost equal to that in frames transmitted by TS1, plus the Port Path Cost configured on DUT.TS1.
- In step 6 and each repetition of step 6, TS4 must capture a properly formatted ST BPDUs with a Root Path Cost equal to the CIST External Root Path Cost in frames transmitted by TS1.

Part B:

- In step 6, record the value of Internal Root Path Cost set by the DUT in its MST BPDUs, and the value of Root Path Cost in its ST BPDUs.
- In step 6, record the Port Role of DUT.TS3.

Part C:

- In step 6 and each repetition of step 6, TS2 must capture a properly formatted MST BPDU with an Internal Root Path Cost equal to 0x00000000.
- In step 6 and each repetition of step 6, TS2 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 6 and each repetition of step 6, TS4 must capture a properly formatted ST BPDU with a Root Path Cost equal to the CIST External Root Path Cost in frames transmitted by TS1. plus the Port Path Cost configured on DUT.TS1.

Possible Problems: None.

Test MSTP.op.1.17 — Erroneous Version 3 Length Field

Purpose: To verify that the DUT validates the version 3 length field on receipt of BPDUs and properly discards those with incorrect or erroneous values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 14.4 [3] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.6

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: When an MST Bridge receives a BPDU where the protocol version identifier is 3 or more, the BPDU type field is 2, the version 1 length field is 0 and the BPDU is 102 or more octets in length, the validation procedure will use the version 3 length field to determine if it should decode the message as a MSTP BPDU. The value of the version 3 length field represents the number of octets that follow in the BPDU. It shall not exceed 1088 octets which represent the length of the MST configuration message and 0 to 64 MSTI Configuration messages. The version 3 length must be at least 64 to accommodate the MST configuration message. Invalid version 3 length fields shall cause the validation procedure to decode the BPDU as an RST BPDU.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Large Version 3 Length Field

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortBigV3Length frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Part B: Small Version 3 Length Field

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortSmallV3Length frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Part C: Medium Version 3 Length Field

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.MakeRootPortInvalidV3Length frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Parts A through C

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU containing a CIST Regional Root Identifier of the DUT and a CIST Root Identifier equal to that used in BPDUs transmitted from TS1.

Possible Problems: None.

Test MSTP.op.1.18 — MSTI Regional Root Identifier Verification

Purpose: To verify that the DUT properly processes and encodes regional root identifiers in MSTI configuration messages.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.27.27 [4] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.4 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 14.6

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The txRstp() procedure transmits a MST BPDU on a port including the parameters of each MSTI message encoded in MSTID order. The regional root identifier constitutes the most significant portion of the MSTI bridge priority vector for a given MSTI. The most significant 4 bits of the MSTI regional root identifier constitute the manageable priority component while octets 3 through 8 represent the unique bridge identifier.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: MSTI Regional Root Identifier Verification - No Bridge Partner

1. Ensure that the Default Test Values are configured on the DUT.
2. Wait 2 seconds.

Part B: MSTI Regional Root Identifier Verification - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMSTIRootID001 frames every two seconds.
3. From TS2, transmit MST.WorseRootIDthanDUT frames every two seconds.
4. Wait 2 seconds.

Part C: MSTI Regional Root Identifier Verification - Inter-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.InterMSTIRootID001 frames every two seconds.
3. From TS2, transmit MST.WorseRootIDthanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Parts A and C:

- TS1 must capture a properly formatted MST BPDU with Regional Root Identifiers for MSTIs 0x001 and 0x002 equal to the Bridge Identifier of the DUT for those MSTIs.

Part B:

- In step 4, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with a Regional Root Identifier for MSTI 0x001 equal to that sent in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.1.19 — MSTI Priority Fields Verification

Purpose: To verify that the DUT properly processes and encodes the root and bridge manageable bridge priority fields.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.24.2 [4] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: sub-clause 13.10 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 14.6

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The txRstp() procedure transmit a MST BPDU on a port including the parameters of each MSTI message encoded in MSTID order. The most significant 4 bits of octet 2 in a MSTI configuration message constitute the manageable priority component of the regional root for a certain MSTI. The 4 most significant bits of Octet 14 conveys the value of the bridge identifier priority for the same MSTI.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: MSTI Regional Root Priority - No Bridge Partner

1. Ensure that the Default Test Values are configured on the DUT.
2. Wait 2 seconds.

Part B: MSTI Regional Root Priority - Intra-Region BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMSTIRootID001 frames every two seconds.
3. From TS2, transmit MST.WorseRootIDthanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 2, TS1 must capture a properly formatted MST BPDU with a Regional Root Priority and Bridge Identifier Priority for MSTIs 0x001 and 0x002 of 0x9 and 0xA respectively.

Part B:

- In Part B, TS1 and TS2 must capture a properly formatted MST BPDU with a Regional Root Priority of 0x6 and a Bridge Identifier Priority of 0x9 for MSTI 0x001.

Possible Problems: None.

Test MSTP.op.1.20 — MSTI Internal Root Path Cost Verification

Purpose: To verify that the DUT properly encodes the internal root path cost for each MSTI configuration message.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.27.27 [3] IEEE Std. 802.1Q-2011: sub-clause 14.6.1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2.5 [4] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The txRstp() procedure transmits a MST BPDU on a port including the parameters of each MSTI message encoded in MSTID order. Octets 10 through 13 of each message encode the internal root path cost for that MSTI. The MSTI internal root path cost conveys the path cost to the MSTI regional root within a MST region.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: MSTI Internal Root Path Cost

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMSTI001PathCost_00030D40 frames every two seconds.
3. From TS2, transmit MST.WorseRootIDthanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU with an internal root path cost for MSTI 0x001 of 0x00061A80 (200000 x 2).

Possible Problems: None.

Test MSTP.op.1.21 — MSTI Remaining Hops Field Verification

Purpose: To verify that the DUT properly verifies and encodes the remaining hops field in each MSTI configuration message.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.18 [4] IEEE Std. 802.1Q-2011: sub-clause 14.2.6
[2] IEEE Std. 802.1Q-2011: sub-clause 13.24.3 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 13.25.8

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The txRstp() procedure transmit a MST BPDU on a port including the parameters of each MSTI message encoded in MSTID order. Octet 16 of each message encodes the remaining hops for each MSTI message. On receipt of a superior MSTI priority vector remainingHops is decremented and used in the updtRcvdInfoWhile() procedure to determine the value of the rcvdInfoWhile timer. If the value decremented remainingHops value is less than or equal to 0 the information is aged out.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: MSTI Remaining Hops Decrement

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMSTI001RemainingHops_13 frames every two seconds.
3. From TS2, transmit MST.IntraMSTI002RemainingHops_02 frames every two seconds.
4. Wait 2 seconds.

Part B: MSTI Remaining Hops Age Out

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMSTI001RemainingHops_01 frames every two seconds.
3. From TS2, transmit MST.WorseRootIDthanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 4, TS3 and TS4 must capture a properly formatted MST BPDU with a Remaining Hops field of 0x12 for MSTI 0x001.
- In step 4, TS3 and TS4 must capture a properly formatted MST BPDU with a Remaining Hops field of 0x01 for MSTI 0x002.

Part B:

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU with a Remaining Hops field of 0x14 for MSTI 0x001.
- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU with a Regional Root Identifier for MSTI 0x001 of the DUT.

Possible Problems: None.

Test MSTP.op.1.22 — VLAN Tagged BPDUs

Purpose: To verify that the DUT does not process tagged MST BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 8.13.10

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Spanning Tree BPDUs transmitted by the Bridge Protocol Entity are not forwarded by Bridges, and must be visible to all other Bridge Protocol Entities attached to the same LAN segment. Such frames shall be transmitted Untagged; tagged BPDUs are not well-formed BPDUs and should not be forwarded by the Bridge.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: VLAN tagged BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit MST.IntraMakeRootPortVLANTagged frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4, using MST.InterMakeRootPortVLANTagged frames in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS1, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Group 2: RST BPDU Format and Processing

Scope: To verify the DUT uses the proper frame format and parameter encoding for RST BPDUs it transmits and that the DUT properly validates the RST BPDUs it receives.

Test MSTP.op.2.1 — Basic RST BPDU Verification

Purpose: To verify that the DUT properly processes basic RST BPDUs with valid field values and transmits properly formatted MST BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.3.2

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: IEEE Std 802.1D-2004 Figure 9-3, in addition to sub-clause 9.3.3, specifies the proper format and encoding of RST BPDUs. To ensure cross-vendor interoperability and backward compatibility an MST Bridge must accept and process RST BPDUs meeting the basic validation requirements of IEEE Std. 802.1Q-2011 sub-clause 14.4. An MST Bridge shall transmit MST BPDUs on any Port that has not been placed in ST BPDU transmission mode by the Port Protocol Migration state machine. MST BPDU format is designed to be processed by RST Bridges, although containing additional information beyond RST BPDU fields.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid BPDU Transmission

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPort frames every two seconds.
3. From TS3, transmit RST.WorseRootIDThanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 4, each port on the DUT must use a unique source MAC address.
- In step 4, the BPDU captured by TS2 and TS3 must be untagged.
- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x03
BPDU Type	0x02
CIST Flags	Designated Port and Forwarding(TS2) Designated Port and Forwarding(TS3)
CIST Root Identifier	Root Bridge Identifier contained in RST.MakeRootPort
CIST External Path Cost	Root Path Cost contained in RST.MakeRootPort + DUT.TS1's Port Path Cost
CIST Regional Root Identifier	DUT's CIST Bridge Identifier
CIST Port Identifier	DUT.TS2 and DUT.TS3's CIST Port Identifier, respec- tively
Message Age	Message Age contained in RST.MakeRootPort + 1 second
Max Age	Max Age contained in RST.MakeRootPort
Hello Time	DUT.TS2 and DUT.TS3's Port Hello Time, respectively
Forward Delay	Forward Delay contained in RST.MakeRootPort
Version 1 Length	0x00
CIST Internal Root Path Cost	0x00000000
CIST Bridge Identifier	DUT's CIST Bridge Identifier
CIST Remaining Hops	DUT's Max Hops

Possible Problems: None.

Test MSTP.op.2.2 — Protocol Identifier Verification

Purpose: To verify that the DUT does not process RST BPDUs with a Protocol Identifier not equal to 0x0000.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.3.2 [4] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Protocol Identifier is encoded in the first and second octets of an RST BPDU. A Protocol Identifier of 0x0000 identifies the frame as a BPDU. Frames containing a Protocol Identifier not equal to 0x0000 are not BPDUs and shall not be processed by an MST Bridge's MSTP entity.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Invalid Protocol Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPortBadProtoID1 frames every two seconds.
3. From TS3, transmit RST.WorseRootThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4, using RST.MakeRootPortBadProtoID2 in step 2.
6. Repeat steps 2 through 4, using RST.MakeRootPortBadProtoID3 in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.2.3 — Protocol Version Identifier Verification

Purpose: To verify that the DUT processes RST BPDUs containing varying Protocol Version Identifier values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.3.2 [4] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Protocol Version Identifier is encoded in the third octet of an RST BPDU. A compliant device must not validate an RST BPDU based on the value encoded in the Protocol Version Identifier field. This allows future versions of the Spanning Tree Protocol to use this field while providing support for legacy versions.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Future Protocol Version Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPortProtoVerID1 frames every two seconds.
3. From TS3, transmit RST.WorseRootThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4, using RST.MakeRootPortProtoVerID2 in step 2.
6. Repeat steps 2 through 4, using RST.MakeRootPortProtoVerID3 in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.2.4 — BPDU Type Field Verification

Purpose: To verify that the DUT does not process RST BPDUs containing invalid BPDU Type values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.3.2 [4] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Each version of STP defines one or more valid BPDU types, encoded in the fourth octet of transmitted BPDUs. For Protocol Version 0x03 of STP, the BPDU Type field is encoded with a value equal to 0x02. For Protocol Version 0x02, any other value in the BPDU Type field denotes an invalid BPDU Type and must not be processed.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Invalid BPDU Types

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPortBadBPDUType1 frames every two seconds.
3. From TS3, transmit RST.WorseRootThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4, using RST.MakeRootPortBadBPDUType2 in step 2.
6. Repeat steps 2 through 4, using RST.MakeRootPortBadBPDUType3 in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.2.5 — CIST Root/CIST Regional Root Identifier Field Verification

Purpose: To verify that the DUT processes RST BPDUs with varying CIST Root Identifier, CIST External Path Cost and CIST Regional Root Identifier field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.4.1 [3] IEEE Std. 802.1Q-2011: sub-clause 13.8
[2] IEEE Std. 802.1Q-2011: sub-clause 13.6.1

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The CIST Root Identifier contained in MST BPDUs transmitted by an MST Bridge is a result of the CIST Priority Vector Calculation process. If an MST Bridge has not received a BPDU from a Bridge within the Region it participates in containing a CIST Root Identifier better than the Bridge's CIST Bridge Identifier, then the Bridge considers itself the CIST Regional Root. Otherwise, the Bridge will appoint the Port receiving the best CIST Internal Path Cost as the CIST Root Port. If an MST Bridge that is the CIST Regional Root has not received a BPDU from outside the Region it participates in containing a CIST Root Identifier (MST BPDUs), or Root Bridge Identifier (ST BPDUs), better than the Bridge's CIST Bridge Identifier, then it will consider itself the CIST Root Bridge. Otherwise, the Bridge will appoint the Port receiving the best CIST Root Identifier as the CIST Root Port.

The Bridge Identifier or Root Bridge Identifier, or CIST Root Identifier, is the concatenation of a 2-byte Bridge Priority and a 6-byte Bridge MAC address. MST Bridges allow Bridge Priority value configuration of only the four most significant bits, thereby supporting a range of Bridge Priority values from 0 to 61440, in increments of 4096. However, IEEE Std 802.1D-1998 ST Bridges allow Bridge Priority value configuration to any value between 0 and 65535. Therefore, MST Bridges must support processing a full range of Bridge Priority values.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: RST BPDU CIST Root Identifier Verification - Priority Portion

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.RootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.RootID0001_000000000000 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using RST.RootID7776_777777777777 and RST.RootID7777_777777777777 in steps 2 and 4, respectively.

Part B: RST BPDU CIST Root Identifier Verification - MAC Address Portion

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.RootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.RootID0000_000000000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5 using RST.RootID7777_777777777776 and RST.RootID7777_777777777777 in steps 2 and 4, respectively.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2, and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- TS3 must capture a properly formatted RST BPDU with a Root Identifier equal to that in the frames transmitted by TS1.

Part B:

- In step 5 and each repetition of step 5, TS2, and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- TS3 must capture a properly formatted RST BPDU with a Root Identifier equal to that in the frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.2.6 — Root Path Cost Field Verification

Purpose: To verify that the DUT processes RST BPDUs with varying Root Path Cost field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2.4 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: sub-clause 14.3.2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The External Root Path Cost for an MST Bridge is the cost of the CIST network path from the Root Port of the MST Regional Root Bridge to the CIST Root Bridge. The External Root Path Cost is not modified within an MST Region; therefore, the CIST External Path Cost value on all MST Bridges within an MST Region is equal. The CIST External Path Cost value is transmitted in BPDUs and may be used to determine the active topology. An MST Bridge encodes the CIST External Path Cost in the Root Path Cost field of ST BPDUs and the CIST External Path Cost field of MST BPDUs.

The following are true of External Path Cost:

- The CIST External Path Cost for the CIST Root Bridge is zero.
- The CIST External Path Cost for all other Bridges is the sum of the ExtRootPathCost portion of the Root Port's port priority vector and Path Cost parameter value configured on the CIST Root Port.
- The External Root Path Cost for an MST Bridge is the cost of the CIST network path from the Root Port of the MST Regional Root Bridge to the CIST Root Bridge.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Root Path Cost equal to 0x00000000 - RST sourced

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.CISTRootPath00000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.CISTRootPath00000001 frames every two seconds.
5. Wait 2 seconds.

Part B: Root Path Cost equal to 0xFFFFFFFF - RST sourced - Informational

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.CISTRootPathFFFFFFFF frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.CISTRootPathFFFFFFFF frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Part A:

- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with an External Root Path Cost equal to the Port Path Cost configured on DUT.TS1.

Part B:

- In step 5, record the behavior of the DUT with respect to External Root Path Cost as well as DUT.TS3's Port Role.

Possible Problems: None.

Test MSTP.op.2.7 — Bridge Identifier Field Verification

Purpose: To verify that the DUT processes MST BPDUs with varying CIST Bridge Identifier field values and properly determines the CIST Root Port based on Bridge Identifier.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2.2 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: sub-clause 14.3.2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: MST BPDUs contain a CIST Bridge Identifier field consisting of the concatenation of a 2-byte Bridge Priority and a 6-byte Bridge MAC address. RST and MST Bridges allow Bridge Priority value configuration of only the four most significant bits, thereby supporting a range of Bridge Priority values from 0 to 61440, in increments of 4096. However, IEEE Std 802.1D-1998 ST Bridges support Bridge Priority value configuration of any value between 0 and 65535.

Therefore, MST Bridges must support processing of a full range of Bridge Priority values. The 6-byte Bridge MAC address component of the CIST Bridge Identifier ensures that the Bridge will be distinguished from all other Bridges on the LAN. Generally, the Bridge MAC address is the MAC address of the Bridge STP entity and is different than the MAC address(es) of the Bridge Port(s). The CIST Bridge Identifier contained in an MST BPDU is always equal to the CIST Bridge Identifier of the transmitting Bridge.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Priority portion of the Bridge Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.CISTBridgeID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.CISTBridgeID0001_000000000000 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.CISTBridgeID7776_777777777777 and RST.CISTBridgeID7777_777777777777 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using RST.CISTBridgeIDFFFE_FFFFFFFF and RST.CISTBridgeIDFFFF_FFFFFFFF in steps 2 and 4, respectively.

Part B: MAC Address portion of the Bridge Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.CISTBridgeID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.CISTBridgeID0000_000000000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.CISTBridgeID7777_777777777776 and RST.CISTBridgeID7777_777777777777 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using RST.CISTBridgeIDFFFF_FFFFFFFF and RST.CISTBridgeIDFFFF_FFFFFFFF in steps 2 and 4, respectively.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.2.8 — Port Identifier Field Verification

Purpose: To verify that the DUT processes RST BPDUs with varying Port Identifier field values and to examine the DUT's Port Identifier configuration mechanism.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2.3 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: sub-clause 14.3.2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: IEEE 802.1Q-2011 ST BPDUs, RST BPDUs and MST BPDUs contain a Port Identifier field consisting of the concatenation of the four most significant bits of the Port Priority value and a 12-bit Port Number value.

The CIST Port Identifier distinguishes the Port from all other Ports on the Bridge and allows the network administrator one additional method to administratively control selection of the Root and Root Port. It may be used as a tiebreaker when two Bridges are directly connected with more than one link and when a Bridge is directly connected to itself. The CIST Port Identifier contained in a BPDU is always that of the Port from which it was transmitted.

xST Bridge Version	802.1D-1998	802.1D-2004	802.1Q-2011
Required Port Number Range	1 - 255	1 - 4095	1 - 4095
Required Port Priority Range	0 - 255	0 - 240*	0 - 240*

* = *Increments of 16*

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Various CIST Port Identifier values

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.PortID0000 frames every two seconds.
3. From TS2, transmit RST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.PortID0001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.PortID0100 and RST.PortID0101 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using RST.PortIDF000 and RST.PortIDF001 in steps 2 and 4, respectively.
8. Repeat steps 2 through 5, using RST.PortIDFFFE and RST.PortIDFFFF in steps 2 and 4, respectively.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.2.9 — Message Age Field Verification

Purpose: To verify that the DUT only processes RST BPDUs containing a Message Age less than the Max Age and that the Message Age is incremented properly in MST BPDUs transmitted by the DUT when it is not the Root.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2 [5] IEEE Std. 802.1Q-2011: Figure 14-1
[3] IEEE Std. 802.1Q-2011: sub-clause 14.3.2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Message Age field represents a decimal number of seconds encoded in hex. The first byte of the Message Age field represents integer seconds in the range 0 to 255. The Message Age field marks the age of the CIST information contained in an MST BPDU relative to the information's origination at the CIST Root Bridge. When a Port receives an MST BPDU containing better information than that which is currently held for the Port, the information is recorded, and the Port's Message Age Timer is set to the Message Age contained in the received MST BPDU. Then Message Age Timer is started - it will increment at regular intervals until new or same information is received or Message Age Timer Expiry occurs.

When a MST Bridge is the CIST Root, it transmits MST BPDUs containing a Message Age of zero. MST Bridges that are the CIST Regional Root transmit MST BPDUs containing a Message Age value equal to the current value of the Message Age Timer for the CIST Root Port of the MST Region it participates in incremented by 1. MST Bridges that are not the CIST Regional Root transmit MST BPDUs containing a Message Age value equal to the Message Age Timer of the Bridge's CIST Root Port. MST BPDUs containing a Message Age that is greater than or equal to their Max Age are immediately aged by the updRcvdInfoWhile() procedure.

xST Bridge Version	802.1D-1998	802.1D-2004	802.1Q-2011
Message Age Increment Range	1 - 4	1	1
Recommended Message Age Increment	1	1	1

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Various Message Age Values

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MessageAge0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.MessageAge0001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.MessageAge1100 and RST.MessageAge1200 in steps 2 and 4, respectively.

Part B: Valid Message Age Value > DUT's Max Age

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MessageAge2000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.MessageAge2001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.MessageAgeFFFE and RST.MessageAgeFFFF in steps 2 and 4, respectively.

Part C: BPDU Containing Message Age Value = BPDU's Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MessageAge1400 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.MessageAge1400 frames every two seconds.
5. Wait 2 seconds.

Part D: rcvdInfoWhile timer timeout

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MessageAge_1300 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Message Age equal to that in frames transmitted by TS1, plus one second.
- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to that in frames transmitted by TS1.

Parts B and C:

- In step 5 and each repetition of step 5, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with Message Age equal to 0x0000.
- In step 5 and each repetition of step 5, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Part D:

- In step 4, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with Message Age equal to 0x1400 and CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.2.10 — Max Age Field Verification

Purpose: To verify that the DUT only accepts RST BPDUs containing a valid Max Age value greater than the Message Age value and that the Max Age value is properly encoded in RST BPDUs transmitted by the DUT.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.14 [4] IEEE Std. 802.1Q-2011: Figure 14-1
[2] IEEE Std. 802.1Q-2011: Table 13-5 [5] IEEE Std. 802.1Q-2011: Figure 14-2
[3] IEEE Std. 802.1Q-2011: sub-clause 14.6

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Max Age field represents a decimal number of seconds encoded in hex. The first byte of the Max Age field represents integer seconds in the range 0 to 255; the second byte represents the decimal value in seconds in the range 0 to 255/256 in increments of 1/256.

The Max Age field provides all xST Bridges in a LAN a value with which to determine if received information is valid or too old. The age of information contained in an xST BPDU is increased at each hop from the information's origination at the Root Bridge. Information that transverse more hops than desired by the network administrator will be considered old, as the xST BPDU will contain a Message Age value greater than, or equal to, the Max Age value.

In order to interoperate with earlier versions of IEEE 802.1Q and IEEE 802.1D, a bridge must enforce the following:
 $2 \times (\text{Bridge_Forward_Delay} - 1.0 \text{ seconds}) \geq \text{Bridge_Max_Age} \geq 2 \times (\text{Bridge_Hello_Time} + 1.0 \text{ seconds})$

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Max Age Value Range:	6 - 40	6 - 40	6 - 40
Recommended Max Age:	20	20	20

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: RST BPDU Containing Small, Valid Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MaxAge0600 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.MaxAge0601 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.MaxAge06FF and RST.MaxAge0700 in steps 2 and 4, respectively.

Part B: RST BPDU Containing Invalid Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MaxAge0500 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.MaxAge0501 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.MaxAgeFFFE and RST.MaxAgeFFFF in steps 2 and 4, respectively.

Observable Results:

Parts A and B:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted from TS1.
- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Max Age equal to that in frames transmitted from TS1.

Possible Problems: None.

Test MSTP.op.2.11 — Hello Time Field Verification

Purpose: To verify that the DUT properly processes RST BPDUs containing various Hello Time values and does not propagate the Hello Time contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 14.2 [3] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 14.3.2 [4] IEEE Std. 802.1Q-2011: Table 13-5

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Hello Time field conveyed in xST BPDUs is not directly used by the Spanning Tree Algorithm of ST Bridges, but is conveyed to facilitate the monitoring of protocol performance by management functions. The Spanning Tree Algorithm does not use the Hello Time value during xST Bridge algorithm state operations; rather the Hello Time value is used to determine the period of BPDU transmission. MST Bridges use the Hello Time value within the Port Transmit State Machine to determine when to transmit ST, TCN and MST BPDUs.

An MST Bridge maintains a per-port Hello Time value for each Port on the Bridge. The per-port Hello Time value is used by the MST Bridge to determine the period of BPDU transmission on each Port and is conveyed in BPDUs transmitted by the Port. The per-port Hello Time value is configured via management, not via information in received BPDUs.

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Hello Time Value Range:	1 - 10	2	2
Recommened Hello Time Value:	2	2	2

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: RST BPDU Containing Various Hello Time Values

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.Hello_0100 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.Hello_0101 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.Hello_0A00 and RST.Hello_0A01 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using RST.Hello_0F00 and RST.Hello_0F01 in steps 2 and 4, respectively.

Part B: Hello Time of 0x0000

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.Hello_0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.Hello_0001 frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Parts A and B:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a MST BPDU with a Hello Time equal to the Port Hello Time configured on DUT.TS2 and DUT.TS4 respectively.

Possible Problems: None.

Test MSTP.op.2.12 — Forward Delay Field Verification

Purpose: To verify that the DUT properly processes RST BPDUs containing various Forward Delay values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.23 [3] IEEE Std. 802.1Q-2011: Table 13-5
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Forward Delay is a Bridge-wide parameter that is conveyed in ST, RST and MST BPDUs to ensure that all Bridges in a Bridged LAN uses a consistent value for the Forward Delay Timer. Forward Delay determines the time spent in the listening and learning states.

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Forward Delay Value Range:	4 - 30	4 - 30	4 - 30
Recommended Forward Delay Value:	15	15	15

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid Forward Delay Value Configured

1. Ensure that the Default Test Values are configured on the DUT.
2. Configure the DUT's Bridge Max Age to 6 seconds.
3. Configure the DUT's Bridge Forward Delay to 4 seconds.
4. From TS1, transmit RST.WorseRootThanDUT frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 7 using 40 seconds and 30 seconds in steps 2 and 3, respectively.

Part B: Recommended Range Forward Delay Value Propagation

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.FwdDelay_0400 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.FwdDelay_0401 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 7, using RST.FwdDelay_1DFF and RST.FwdDelay_1E00 in steps 2 and 4, respectively.

Part C: Large Forward Delay Value Propagation

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.FwdDelay_1E01 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.FwdDelay_1E02 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using RST.FwdDelay_FFFE and RST.FwdDelay_FFFF in steps 2 and 4, respectively.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS1 and TS2 must capture a properly formatted MST BPDUs with Forward Delay equal to the DUT's configured Forward Delay.
- In step 5 and each repetition of step 5, TS1 and TS2 must capture a properly formatted MST BPDUs with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Part B and C:

- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDUs with Forward Delay equal to that in frames transmitted by TS1.
- In step 5 and each repetition of step 5, TS2 and TS4 must capture a properly formatted MST BPDUs with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.2.13 — Large BPDU Message Times

Purpose: To verify that the DUT properly processes RST BPDUs containing large CIST message times and propagates the Max Age and Forward Delay values contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.2
[2] IEEE Std. 802.1Q-2011: sub-clause 13.18 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: ST, RST and MST Bridges support a range of timer values and methods designed to age out old information in the Bridged LAN. MST Bridges must support the ability to process each of the information ageing methods and operate in a network consisting of many different information-ageing elements (IEEE 802.1D-1998, IEEE 802.1w-2001, IEEE 802.1D-2004 and IEEE 802.1Q-2011).

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid Large Message Times

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPortBigMsgTimes1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.MakeRootPortBigMsgTimes2 frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Part A:

- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Max Age and Forward Delay equal to that in frames transmitted by TS1.
- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with Hello Time equal to the Port Hello Time configured on DUT.TS2 and DUT.TS4 respectively.

Possible Problems: None.

Test MSTP.op.2.14 — BPDU Length Verification

Purpose: To verify that the DUT properly processes RST BPDUs of various lengths and propagates the information contained in invalid received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.5.3 [4] IEEE Std. 802.1Q-2011: sub-clause 14.3.2
[2] IEEE Std. 802.1Q-2011: sub-clause 13.27.22 [5] IEEE Std. 802.1Q-2011: sub-clause 14.4
[3] IEEE Std. 802.1Q-2011: sub-clause 14.1 [6] IEEE Std. 802.1Q-2011: Figure 14-1

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The requirements for validation of received BPDUs depend on BPDU type: ST BPDU, RST BPDU, MST BPDU, and TCN BPDU. A BPDU shall be considered invalid and shall not be processed if it does not contain the minimum number of octets specified for a particular BPDU type: 35, 36, 35 and 4, respectively. Additionally, a minimum BPDU size equal to 102 octets is defined for MST BPDUs. By default, all BPDUs transmitted in valid Ethernet frames must contain at least 48 octets between the Length field and the FCS. Therefore, all BPDUs transmitted in valid Ethernet frames satisfy the minimum BPDU size requirements.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid BPDU Lengths

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPortBPDULength1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4, using RST.MakeRootPortBPDULength2 frame in step 2.
6. Repeat steps 2 through 4, using RST.MakeRootPortBPDULength3 frame in step 2.
7. Repeat steps 2 through 4, using RST.MakeRootPortBPDULength4 frame in step 2.
8. Repeat steps 2 through 4, using RST.MakeRootPortBPDULength5 frame in step 2.

Part B: Invalid BPDU Lengths

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPortLength1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.
5. Repeat steps 2 through 4, using RST.MakeRootPortLength2 frame in step 2.
6. Repeat steps 2 through 4, using RST.MakeRootPortLength3 frame in step 2.

Observable Results:

Part A:

- In step 4 and each repetition of step 4, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 4 and each repetition of step 4, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the CIST Root Identifier configured on the DUT.

Possible Problems: None.

Test MSTP.op.2.15 — Receive Identical RST BPDUs On Two Different Ports

Purpose: To verify that the DUT properly processes RST BPDUs when receiving identical BPDUs on two different Ports.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.5.3 [3] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [4] IEEE Std. 802.1Q-2011: Figure 14-2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: When a Bridge receives two identical RST BPDUs on two different Bridge Ports it indicates there is a strong possibility of a network loop. To address this issue MST Bridges must place one of the two Ports in the Blocking State. The Port with a lesser CIST Port Identifier must be placed in the Blocking State.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Receive Identical RST BPDUs On Two Different Ports. DUT Is Not Root.

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.IdenticalBPDU1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.IdenticalBPDU1 frames every two seconds.
5. Wait 2 seconds.

Part B: Receive Identical RST BPDUs On Two Different Ports

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.IdenticalBPDU2 frames every two seconds
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit RST.IdenticalBPDU2 frames every two seconds
5. Wait 2 seconds.

Observable Results:

Part A:

- In step 5, TS2 and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 5, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.2.16 — VLAN Tagged BPDUs

Purpose: To verify that the DUT does not process tagged MST BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 8.13.10

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Spanning Tree BPDUs transmitted by the Bridge ProtocolEntity are not forwarded by Bridges, and must be visible to all other Bridge Protocol Entities attached to the same LAN segment. Such frames shall be transmitted Untagged; any BPDUs that carry a tag header are not recognized as well-formed BPDUs and are not forwarded by the Bridge.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: VLAN tagged BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit RST.MakeRootPortVLANTagged frames every two seconds.
3. Wait 2 seconds.

Observable Results:

Part A:

- In step 3, TS1, TS2, and TS3 must capture a properly formatted MST BPDU with a CIST Root Identifier equal to the DUT's Bridge Identifier.

Possible Problems: None.

Group 3: ST BPDU Format and Processing

Scope: To verify the DUT uses the proper frame format and parameter encoding for ST BPDUs it transmits and that the DUT properly validates the ST BPDUs it receives.

Test MSTP.op.3.1 — Basic ST BPDU Verification

Purpose: To verify that the DUT properly processes basic ST BPDUs with valid field values and transmits properly formatted ST BPDUs on Ports that have received an ST BPDU within the past 3 seconds.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.3.1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: IEEE Std 802.1D-1998 Figure 9-1 and sub-clauses 9.2, 9.3.1 specify the proper format and encoding of ST BPDUs. To ensure full legacy support and cross-vendor interoperability, an ST BPDU transmitted by an MST Bridge must adhere to the specified rules for format and encoding. An MST Bridge shall transmit ST BPDUs on any Port that has received an ST BPDU within 3 seconds (default Migrate Time value), as specified by the Port Protocol Migration state machine.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid BPDU Transmission - DUT is Root

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.WorseRootIDthanDUT frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Part B: Valid BPDU Transmission - DUT is not Root

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPort frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. Wait 2 seconds.

Part C: Valid TCN BPDU Transmission - TCN BPDUs

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPort frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit a ST.TCN_BPDU frame.
5. Wait 2 seconds.

Observable Results:*Part A:*

- In step 4, DUT.TS1 must use a unique source MAC address.
- In step 4, frames captured by TS1 must be untagged.
- In step 4, TS1 must capture a properly formatted ST BPDU containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x00
BPDU Type	0x00
Flags	0x00
Root Bridge Identifier	DUT's CIST Bridge Identifier
Root Path Cost	0x00000000
Designated Bridge Identifier	DUT's CIST Bridge Identifier
Designated Port Identifier	DUT.TS1's CIST Port Identifier
Message Age	0x0000
Max Age	DUT's Max Age
Hello Time	DUT.TS1's Port Hello Time
Forward Delay	DUT's Forward Delay

- In step 4, DUT.TS2 must use a unique source MAC address.
- In step 4, frames captured by TS2 must be untagged.
- In step 4, TS2 must capture properly formatted MST BPDUs containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x03
BPDU Type	0x02
CIST Flags	Designated Port and Forwarding
CIST Root Identifier	DUT's CIST Bridge Identifier
CIST External Path Cost	0x00000000
CIST Regional Root Identifier	DUT's CIST Bridge Identifier
CIST Port Identifier	DUT.TS2's CIST Port Identifier
Message Age	0x0000
Max Age	DUT's Max Age
Hello Time	DUT.TS2's Port Hello Time
Forward Delay	DUT's Forward Delay
Version 1 Length	0x00
CIST Internal Root Path Cost	0x00000000
CIST Bridge Identifier	DUT's CIST Bridge Identifier
CIST Remaining Hops	DUT's Max Hops

Part B:

- In step 5, DUT.TS2 and DUT.TS3 must use unique source MAC addresses.
- In step 5, frames captured by TS2 and TS3 must be untagged.
- In step 5, TS2 and TS3 must capture properly formatted MST BPDUs containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x03
BPDU Type	0x02
CIST Flags	Designated Port and Forwarding(TS2) Designated Port and Forwarding(TS3)
CIST Root Identifier	Root Identifier contained in ST.MakeRootPort
CIST External Path Cost	Path Cost contained in ST.MakeRootPort incremented by DUT.TS1's Port Path Cost
CIST Regional Root Identifier	DUT's CIST Bridge Identifier
CIST Port Identifier	DUT.TS2 and DUT.TS3's CIST Port Identifier, respectively
Message Age	Message Age contained in ST.MakeRootPort incremented by 1.
Max Age	Max Age Contained in ST.MakeRootPort
Hello Time	DUT.TS2 and DUT.TS3's Port Hello Time, respectively
Forward Delay	Forward Delay contained in ST.MakeRootPort
Version 1 Length	0x00
CIST Internal Root Path Cost	0x00000000
CIST Bridge Identifier	DUT's CIST Bridge Identifier
CIST Remaining Hops	DUT's Max Hops

- In step 5, DUT.TS4 must use a unique source MAC address.
- In step 5, frames captured by TS4 must be untagged.
- In step 5, TS4 must capture properly formatted ST BPDUs containing the following fields and values:

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x00
BPDU Type	0x00
Flags	0x00
Root Bridge Identifier	Root Identifier contained in ST.MakeRootPort
Root Path Cost	Path Cost contained in ST.MakeRootPort incremented by DUT.TS1's Port Path Cost
Designated Bridge Identifier	DUT's CIST Bridge Identifier
Designated Port Identifier	DUT.TS4's CIST Port Identifier
Message Age	Message Age contained in ST.MakeRootPort incremented by 1.
Max Age	Max Age Contained in ST.MakeRootPort
Hello Time	DUT.TS4's Port Hello Time
Forward Delay	Forward Delay contained in ST.MakeRootPort

Part C:

- In step 5, DUT.TS1 must use a unique source MAC address.
- In step 5, frames captured by TS1 must be untagged.
- In step 5, TS1 must capture a TCN BPDU.

BPDU Field Name	Field Value
Protocol Identifier	0x0000
Protocol Version Identifier	0x00
BPDU Type	0x80

Possible Problems: None.

Test MSTP.op.3.2 — Protocol Identifier Verification

Purpose: To verify that the DUT does not process ST BPDUs with a Protocol Identifier not equal to 0x0000.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.3.1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Protocol Identifier is encoded in the first and second octets of an ST BPDU. A Protocol Identifier of 0x0000 identifies the frame as a BPDU. Frames containing a Protocol Identifier not equal to 0x0000 are not BPDUs and shall not be processed by an MST Bridge's MSTP entity.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Invalid Protocol Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPortBadProtoID1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MakeRootPortBadProtoID2 in step 2.
7. Repeat steps 2 through 5, using ST.MakeRootPortBadProtoID3 in step 2.
8. Repeat steps 2 through 5, using ST.TCN_BadProtoID in step 2.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS1, TS2, TS3, and TS4 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier. None of the frames captured should contain topology change information.

Possible Problems: None.

Test MSTP.op.3.3 — Protocol Version Identifier Verification

Purpose: To verify that the DUT processes ST BPDUs containing varying Protocol Version Identifier values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.3.1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Protocol Version Identifier is encoded in the third octet of an ST BPDU. A compliant device must not validate an ST BPDU based on the value encoded in the Protocol Version Identifier field. This allows future versions of the Spanning Tree Protocol to use this field while providing legacy support for STP.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Future Protocol Version Identifier - ST BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPortProtoVerID1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MakeRootPortProtoVerID2 in step 2.
7. Repeat steps 2 through 5, using ST.MakeRootPortProtoVerID3 in step 2.

Part B: Future Protocol Version Identifier - TCN BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPortProtoVerID1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. From TS4, transmit a TCN_ProtoVerID frame.
6. Wait 2 seconds.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDUs with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 5 and each repetition of step 5, TS4 must capture a properly formatted ST BPDUs with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 6, TS1 must capture one TCN BPDU.

Possible Problems: None.

Test MSTP.op.3.4 — BPDU Type Field Verification

Purpose: To verify that the DUT does not process ST BPDUs containing an invalid BPDU Type field value.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.3.1
[2] IEEE Std. 802.1Q-2011 sub-clause 14.2 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Each version of STP defines one or more valid BPDU types. For version 0x00 of STP, the BPDU Type field allows a device to distinguish between an ST BPDU and a TCN BPDU. A BPDU Type field value of 0x00 denotes an ST BPDU and a BPDU Type field value of 0x80 denotes a TCN BPDU. For Protocol Version 0x00, any other value in the BPDU Type field denotes an invalid BPDU Type and must not be processed. The BPDU Type field is encoded in the fourth octet of a BPDU.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: BPDU Type - TCN BPDUs

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPort frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. From TS4, transmit one ST.TCN_BPDU frame.
6. Wait 2 seconds.

Part B: Invalid BPDU Types

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPortBadBPDUType1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MakeRootPortBadBPDUType2 in step 2.
7. Repeat steps 2 through 5, using ST.MakeRootPortBadBPDUType3 in step 2.
8. Repeat steps 2 through 5, using TCN_BadBPDUType in step 2.

Observable Results:

Part A:

- In step 6, TS1 must capture one TCN BPDU with a Type field containing 0x80.
- In step 6, TS2 and TS3 must capture a properly formatted MST BPDU with the Topology Change Flag set to TRUE.
- In step 6, TS4 must capture a ST BPDU with the BPDU Flags set to 0x81.

Part B:

- In step 5 and each repetition of step 5, TS1, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.
- In step 5 and each repetition of step 5, TS4 must capture a properly formatted ST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.3.5 — BPDU Flags Field Verification

Purpose: To verify that the DUT processes ST BPDUs with varying valid BPDU Flags field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.3.1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Each version of Spanning Tree defines one or more flags, encoded using one or more bits within the BPDU Flags field. ST Version 0x00 defines 2 flags, each encoded in a single bit. The least significant bit in the BPDU flags field is the Topology Change Flag and the most significant bit is the Topology Change Acknowledgement flag. The Topology Change Flag notifies Bridges throughout the LAN that a change has occurred in the topology of the LAN. Each ST Bridge that receives such a notification sets the ageing time for its Filtering Database equal to Forward Delay. As a result, all dynamic filtering entries that are not updated during the next Forward Delay interval are flushed. Each RST or MST Bridge that receives such a notification flushes its Filtering Database entries on all Ports other than the receiving Port.

ST, RST and MST Bridges respond to Topology Change Notification BPDUs by setting the Topology Change Acknowledgement Flag in the next ST BPDUs transmitted on the Port that received the TCN BPDUs. This will cause the Bridge transmitting TCN BPDUs to stop transmission of TCN BPDUs (until another Topology Change is detected). Bits 2-7 of the Flags field are reserved for future use and are not checked upon reception of a ST BPDUs.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: BPDU Flags Field of 0x81

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPort frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. From TS4, transmit one TCN_BPDUs frame.
6. Wait 2 seconds.
7. From TS1, cease transmission of ST.MakeRootPort frames.
8. From TS1, transmit one ST.TC_TCackBPDUs frame.
9. Wait 2 seconds.
10. From TS1, transmit ST.MakeRootPort frames every two seconds.
11. Wait 30 seconds.

Observable Results:

Part A:

- In step 7, TS1 must capture one properly formatted TCN BPDU.
- In step 7, TS2 and TS3 must capture one properly formatted MST BPDU with the Topology Change Flag set to TRUE.
- In step 7, TS4 must capture one properly formatted ST BPDU with the Topology Change Flags Field set to 0x81.
- In step 10, TS1 must not capture any BPDUs
- In step 12, TS1 must not capture any BPDUs.
- In steps 7, 10, and 12, TS2 and TS3 should receive MST BPDUs with CIST Root Identifier equal to that in frames transmitted by TS1.
- In steps 7, 10, and 12, TS4 should receive ST BPDUs with Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.3.6 — Root Identifier Field Verification

Purpose: To verify that the DUT processes ST BPDUs with varying Root Bridge Identifier, Bridge Identifier, and Root Path Cost field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.2.4
[2] IEEE Std. 802.1Q-2011: sub-clause 13.9 [4] IEEE Std. 802.1Q-2011: sub-clause 14.2.5

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Root Identifier contained in ST BPDUs transmitted by an MST Bridge is a result of the CIST Priority Vector Calculation process. If an MST Bridge has not received a BPDU from a Bridge within the Region it participates in containing a Root Identifier, CIST Root Identifier, better than the Bridge's CIST Bridge Identifier, then the Bridge considers itself the CIST Regional Root. If an MST Bridge that is the CIST Regional Root and has not received a BPDU from outside the Region it participates in containing a CIST Root Identifier (MST BPDUs), or Root Bridge Identifier (ST BPDUs), better than the Bridge's CIST Bridge Identifier, then it will consider itself the CIST Root. Otherwise, the Bridge will appoint the Port receiving the best CIST Root Identifier as the CIST Root Port.

The Bridge Identifier or Root Bridge Identifier, or CIST Root Identifier, is the concatenation of a 2-byte Bridge Priority and a 6-byte Bridge MAC address. MST Bridges allow Bridge Priority value configuration of only the four most significant bits, thereby supporting a range of Bridge Priority values from 0 to 61440, in increments of 4096. However, IEEE Std 802.1D-1998 ST Bridges allow Bridge Priority value configuration to any value between 0 and 65535. Therefore, MST Bridges must support processing a full range of Bridge Priority values.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: ST BPDU Root Identifier Verification - Priority Portion

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.RootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.RootID0001_000000000000 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.RootID7776_777777777777 and ST.RootID7777_777777777777 frames in steps 2 and 4, respectively.

Part B: ST BPDU Root Identifier Verification - MAC Address Portion

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.RootID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.RootID0000_000000000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.RootID7777_777777777776 and ST.RootID7777_777777777777 frames in steps 2 and 4, respectively.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 5 and each repetition of step 5, TS4 must capture a properly formatted ST BPDU with Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.3.7 — Root Path Cost Field Verification

Purpose: To verify that the DUT processes ST BPDUs with varying Root Path Cost field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.2.4
[2] IEEE Std. 802.1Q-2011: sub-clause 13.9 [4] IEEE Std. 802.1Q-2011: sub-clause 14.2.5

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The External Root Path Cost for an MST Bridge is the cost of the CIST network path from the Root Port of the MST Regional Root Bridge to the CIST Root Bridge. The External Root Path Cost is not modified within an MST Region; therefore, the CIST External Path Cost value on all MST Bridges within an MST Region is equal. The CIST External Path Cost value is transmitted in BPDUs and may be used to determine the active topology. An MST Bridge encodes the CIST External Path Cost in the Root Path Cost field of ST BPDUs and the CIST External Path Cost field of MST BPDUs. The CIST External Path Cost for the CIST Root Bridge is zero. The CIST External Path Cost for all other Bridges is the sum of the ExtRootPathCost portion of the Root Port's port priority vector and Path Cost parameter value configured on the CIST Root Port.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Root Path Cost of 0x00000000 - ST sourced

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.CISTRootPath00000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit ST.WorseRootIDThanDUT frames every two seconds.
5. From TS4, transmit ST.CISTRootPath00000001 frames every two seconds.
6. Wait 2 seconds.

Part B: Root Path Cost of 0xFFFFFFFF - ST sourced - Informational

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.CISTRootPathFFFFFFFFE frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.CISTRootPathFFFFFFFFF frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Part A:

- In step 6, TS2 and TS3 must capture a properly formatted MST BPDU with External Root Path Cost equal to that in frames transmitted by TS1. plus DUT.TS1's Port Path Cost.
- In step 6, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 5, record the DUT's behavior with respect to Root Path Cost, as well as DUT.TS4's Port Role.

Possible Problems: None.

Test MSTP.op.3.8 — Bridge Identifier Field Verification

Purpose: To verify that the DUT processes ST BPDUs with varying Bridge Identifier field values.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.3.1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2.2 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: ST BPDUs contain a Bridge Identifier field consisting of the concatenation of a 2-byte Bridge Priority and a 6-byte Bridge MAC address. RST and MST Bridges allow Bridge Priority value configuration of only the four most significant bits, thereby supporting a range of Bridge Priority values from 0 to 61440, in increments of 4096. However, IEEE Std 802.1D-1998 ST Bridges support Bridge Priority value configuration of any value between 0 and 65535. Therefore, RST and MST Bridges must support processing of a full range of Bridge Priority values. The 6-byte Bridge MAC address component of the Bridge Identifier ensures that the Bridge will be distinguished from all other Bridges on the LAN. Generally, the Bridge MAC address is the MAC address of the Bridge STP entity, and is different than the MAC address(es) of the Bridge Port(s). The Bridge Identifier contained in an ST BPDU is always equal to the Bridge Identifier of the transmitting Bridge

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Priority portion of the Bridge Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.CISTBridgeID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.CISTBridgeID0001_000000000000 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.CISTBridgeID7776_777777777777 and ST.CISTBridgeID7777_777777777777 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using ST.CISTBridgeIDFFFE_FFFFFFFF and ST.CISTBridgeIDFFFF_FFFFFFFF in steps 2 and 4, respectively.

Part B: MAC Address portion of the Bridge Identifier

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.CISTBridgeID0000_000000000000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.CISTBridgeID0000_000000000001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.CISTBridgeID7777_777777777776 and ST.CISTBridgeID7777_777777777777 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using ST.CISTBridgeIDFFFF_FFFFFFFF and ST.CISTBridgeIDFFFF_FFFFFFFF in steps 2 and 4, respectively.

Observable Results:

Parts A and B:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted from TS1.

Possible Problems: None.

Test MSTP.op.3.9 — Port Identifier Field Verification

Purpose: To verify that the DUT processes ST BPDUs with varying Port Identifier field values, and to examine the DUT's Port Identifier configuration mechanism.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.2.3
[2] IEEE Std. 802.1Q-2011: sub-clause 13.25.32 [4] IEEE Std. 802.1Q-2011: sub-clause 14.3.1

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: IEEE 802.1D-1998 ST BPDUs contain a Port Identifier field consisting of the concatenation of an 8-bit Port Priority value and an 8-bit Port Number value. IEEE 802.1t-2001 ST BPDUs, RST BPDUs and MST BPDUs contain a Port Identifier field consisting of the concatenation of the four most significant bits of the Port Priority value and a 12-bit Port Number value.

The Port Identifier distinguishes the Port from all other Ports on the Bridge and allows the network administrator one additional method to administratively control selection of the Root and Root Port. The Port Identifier may be used as a tiebreaker when two Bridges are directly connected with more than one link and when a Bridge is directly connected to itself. The Port Identifier contained in a BPDU is always that of the Port from which it was transmitted.

xST Bridge Version	802.1D-1998	802.1D-2004	802.1Q-2011
Required Port Number Range	1 - 255	1 - 4095	1 - 4095
Required Port Priority Range	0 -255	0 - 240*	0 - 240*

* = *Increments of 16*

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Various Port Identifier Values

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.PortID_0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.PortID_0001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.PortID_0100 and ST.PortID_0101 in steps 2 and 4, respectively.
7. Repeat steps 2 through 5, using ST.PortID_F000 and ST.PortID_F001 in steps 2 and 4, respectively.
8. Repeat steps 2 through 5, using ST.PortID_FFFE and ST.PortID_FFFF in steps 2 and 4, respectively.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1

Possible Problems: None.

Test MSTP.op.3.10 — Message Age Field Verification

Purpose: To verify that the DUT only accepts ST BPDUs containing a Message Age value less than the Max Age value and that the Message Age value contained in ST BPDUs transmitted by the DUT (when it is not the Root Bridge) is incremented properly.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.3.1
[2] IEEE Std. 802.1Q-2011: sub-clause 14.2 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Message Age field represents a decimal number of seconds encoded in hex. The first byte of the Message Age field represents integer seconds in the range 0 to 255.

The Message Age field marks the age of the CIST information contained in an ST or MST BPDU relative to the information's origination at the CIST Root Bridge. When a Port receives an ST BPDU containing better information than that which is currently held for the Port, the information is recorded, and the Port's Message Age Timer is set to the Message Age contained in the received ST BPDU. The Message Age Timer is started - it will increment at regular intervals until new or same information is received or Message Age Timer Expiry occurs.

When an MST Bridge is the CIST Root it transmits ST and MST BPDUs containing a Message Age of zero. MST Bridges that are the CIST Regional Root transmit ST and MST BPDUs containing a Message Age value equal to the current value of the Message Age Timer for the CIST Root Port of the MST Region it participates in incremented by 1. MST Bridges that are not the CIST Regional Root transmit ST and MST BPDUs containing a Message Age value equal to the Message Age Timer of the Bridge's CIST Root Port. ST BPDUs containing a Message Age that is greater than or equal to their Max Age are not valid BPDUs, and the information they contain shall not be processed.

xST Bridge Version	802.1D-1998	802.1D-2004	802.1Q-2011
Message Age Increment Range	1 - 4	1	1
Recommended Message Age Increment	1	1	1

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid message Age Value < DUT's Max Age

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MessageAge_0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.MessageAge_0001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MessageAge_1200 and ST.MessageAge_1201 in steps 2 and 4, respectively.

Part B: Valid Message Age Value > DUT's Max Age

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MessageAge_2000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.MessageAge_2001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MessageAge_FFFE and ST.MessageAge_FFFF in steps 2 and 4, respectively.

Part C: BPDU Containing Message Age Value = BPDU's Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MessageAge_1400 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.MessageAge_1400 frames every two seconds.
5. Wait 2 seconds.

Part D: rcvdInfoWhile timer timeout

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MessageAge_1300 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. Wait 2 seconds.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with Message Age equal to that in frames transmitted by TS1 plus 1 second.
- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Parts B and C:

- In step 5 and each repetition of step 5, TS1 and TS4 must capture a properly formatted ST BPDU with Message Age equal to 0x0000.
- In step 5 and each repetition of step 5, TS1 and TS4 must capture a properly formatted ST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.
- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with Message Age equal to 0x0000.
- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Part D:

- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU with Message Age equal to that in frames transmitted by TS1 plus 1 second.
- In step 4, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 4, TS4 must capture a properly formatted ST BPDU with Message Age equal to that in frames transmitted by TS1 plus 1 second.
- In step 4, TS4 must capture a properly formatted ST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.3.11 — Max Age Field Verification

Purpose: To verify that the DUT only accepts ST BPDUs containing a valid Max Age value greater than DUT.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.2
[2] IEEE Std. 802.1Q-2011: sub-clause 13.23 [4] IEEE Std. 802.1Q-2011: Table 13-5

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Max Age field represents a decimal number of seconds encoded in hex. The first byte of the Max Age field represents integer seconds in the range 0 to 255; the second byte represents the decimal value in seconds in the range 0 to 255/256 in increments of 1/256.

The Max Age field provides all ST Bridges in a LAN a value with which to determine if received information is valid or too old. The age of information contained in an ST BPDU is increased at each hop from the information's origination at the Root Bridge. Information that traverse more hops than desired by the network administrator will be considered old, as the BPDU will contain a Message Age value greater than, or equal to, the Max Age value.

ST BPDUs containing a Message Age that is greater than or equal to their Max Age are not valid BPDUs, and the information they contain shall not be processed.

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Max Age Value Range:	6 - 40	6 - 40	6 - 40
Recommended Max Age:	20	20	20

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: ST BPDU Containing Small, Valid Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MaxAge_0600 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.MaxAge_0601 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MaxAge_06FF and ST.MaxAge_0700 in steps 2 and 4, respectively.

Part B: ST BPDU Containing Invalid Max Age Value

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MaxAge_0500 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.MaxAge_0501 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MaxAge_FFFE and ST.MaxAge_FFFF in steps 2 and 4 respectively.

Observable Results:

Parts A and B:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with Max Age equal to that in frames transmitted by TS1.
- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.3.12 — Hello Time Field Verification

Purpose: To verify that the DUT properly processes ST BPDUs containing various Hello Time values and does not propagate the Hello Time contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [2] IEEE Std. 802.1Q-2011: Table 13-5

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Hello Time field conveyed in ST BPDUs is not directly used by the Spanning Tree Algorithm of ST Bridges, but is conveyed to facilitate the monitoring of protocol performance by management functions. The Spanning Tree Algorithm does not use the Hello Time value during ST Bridge algorithm state operations; rather the Hello Time value is used to determine the period of BPDU transmission. MST Bridges use the Hello Time value within the Port Transmit State Machine to determine when to transmit ST, TCN and MST BPDUs.

An ST Bridge that is Root sets its Hello Timer to the value of Bridge Hello Time. An ST Bridge that is not Root uses its own Bridge Hello Time value to determine the rate at which TCN BPDUs should be transmitted (rather than the value conveyed in BPDUs). An MST Bridge maintains a per-port Hello Time value for each Port on the Bridge. The per-port Hello Time value is used by the MST Bridge to determine the period of BPDU transmission on each Port and is conveyed in BPDUs transmitted by the Port. The per-port Hello Time value is configured via management, not via information in received BPDUs.

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Hello Time Value Range:	1 - 10	2	2
Recommened Hello Time Value:	2	2	2

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: ST BPDU Containing Valid Hello Time Values

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.Hello_0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, trnasmit ST.Hello_0001 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.Hello_0A00 and ST.Hello_0A01 in steps 2 and 4, respectively.
7. Repeat Steps 2 through 5, using ST.Hello_0F00 and ST.Hello_0F01 in steps 2 and 4, respectively.

Part B: Hello Time of 0x0000

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.Hello_0000 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS3, transmit ST.Hello_0001 frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Parts A and B:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU every two seconds, with CIST Root Identifier equal to that in frames transmitted from TS1.
- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU every two seconds, with a Hello Time equal to the Port Hello Time configured on DUT.TS2 and DUT.TS3, respectively.

Possible Problems: None.

Test MSTP.op.3.13 — Forward Delay Field Verification

Purpose: To verify that the DUT properly processes ST BPDUs containing various Forward Delay values and propagates the Forward Delay contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: Table 13-5
[2] IEEE Std. 802.1Q-2011: sub-clause 13.23

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The Forward Delay is a Bridge-wide parameter that is conveyed in ST, RST and MST BPDUs to ensure that all Bridges in a Bridged LAN uses a consistent value for the Forward Delay Timer. Forward Delay determines the time spent in the listening and learning states.

xST Bridge Version:	802.1D-1998	802.1D-2004	802.1Q-2011
Forward Delay Value Range:	4 - 30	4 - 30	4 - 30
Recommended Forward Delay Value:	15	15	15

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Recommended Range Forward Delay Value Propagation

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.FwdDelay_0400 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.FwdDelay_0401 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.FwdDelay_1DFF and ST.FwdDelay_1E00 in steps 2 and 4, respectively.

Part B: Large Forward Delay Value Propagation

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.FwdDelay_1E01 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.FwdDelay_1E02 frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.FwdDelay_FFFE and ST.FwdDelay_FFFF in steps 2 and 4, respectively

Observable Results:

Parts A and B:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with Forward Delay equal to that in frames transmitted by TS1.
- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Possible Problems: None.

Test MSTP.op.3.14 — Large BPDU Message Times

Purpose: To verify that the DUT properly processes ST BPDUs containing large CIST message times and propagates the Max Age and Forward Delay values contained in received BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [3] IEEE Std. 802.1Q-2011: sub-clause 14.2
[2] IEEE Std. 802.1Q-2011: sub-clause 13.24.3 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: ST, RST, and MST Bridges support a range of timer values and methods designed to age out old information in the Bridged LAN. MST Bridges must support the ability to process each of the information ageing methods and operate in a network consisting of many different information-ageing elements (IEEE 802.1D-1998, IEEE 802.1w-2001, IEEE 802.1D-2004, and IEEE 802.1Q-2011). This Test examines the DUT's behavior in various information-ageing scenarios.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Valid Large Message Times

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPortBigMsgTimes1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.MakeRootPortBigMsgTimes2 frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Part A:

- In step 5, TS2 and TS3 must capture a properly formatted MST BPDU with Max Age and Forward Delay equal to those in frames transmitted by TS1.
- In step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.
- In step 5, TS2 and TS3 must capture a properly formatted MST BPDU with Hello Time equal to Port Hello Time configured for DUT.TS2 and DUT.TS3 respectively.

Possible Problems: None.

Test MSTP.op.3.15 — Length/Type Field Verification

Purpose: To verify that the DUT properly processes ST BPDUs containing a Length field other than 0x0026 and propagates the information contained in the BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.5.3 [4] IEEE Std. 802.1Q-2011: sub-clause 14.4
[2] IEEE Std. 802.1Q-2011: sub-clause 13.6.1 [5] IEEE Std. 802.1Q-2011: Figure 13-9
[3] IEEE Std. 802.1Q-2011: sub-clause 14.2

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: The requirements for validation of received BPDUs depend on BPDUs type: ST BPDUs, RST BPDUs, MST BPDUs, and TCN BPDUs. A BPDUs shall be considered invalid and shall not be processed if it does not contain the minimum number of octets specified for a particular BPDUs type: 35, 36, 35 and 4, respectively. Additionally, a minimum BPDUs size equal to 102 octets is defined for MST BPDUs. By default, all BPDUs transmitted in valid Ethernet frames must contain at least 48 octets between the Length field and the FCS. Therefore, all BPDUs transmitted in valid Ethernet frames satisfy the minimum BPDUs size requirements.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Length/Type Validation

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPortLength1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.WorseRootIDthanDUT frames every two seconds.
5. Wait 2 seconds.
6. Repeat steps 2 through 5, using ST.MakeRootPortLength2 frame in step 2.
7. Repeat steps 2 through 5, using ST.MakeRootPortLength3 frame in step 2.

Observable Results:

Part A:

- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDUs with the correct Length/Type Field.
- In step 5 and each repetition of step 5, TS2 and TS3 must capture a properly formatted MST BPDUs with CIST Root Identifier equal to the CIST Root Identifier configured on the DUT.

Possible Problems: None.

Test MSTP.op.3.16 — Receive Identical ST BPDUs On Two Different Ports

Purpose: To verify that the DUT properly processes identical ST BPDUs received on two different ports.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 13.5.3 [3] IEEE Std. 802.1Q-2011: Figure 13-9
[2] IEEE Std. 802.1Q-2011: sub-clause 13.6.1

Resource Requirements: 4 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: When a Bridge receives two identical ST BPDUs on two different Bridge Ports, it indicates there is a strong possibility of a network loop. To address this issue MST Bridges must place one of the two Ports in the Discarding State. If the two receiving Ports receive identical ST BPDUs with superior information, the Port with a greater CIST Port Identifier must be placed in the Discarding State.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: Receive Identical ST BPDUs On Two Different Ports. DUT Is Not Root.

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.IdenticalBPDU1 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.IdenticalBPDU1 frames every two seconds.
5. Wait 2 seconds.

Part B: Receive Identical ST BPDUs On Two Different Ports. DUT Is Root.

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.IdenticalBPDU2 frames every two seconds.
3. From TS2, transmit MST.OtherRegionThanDUT frames every two seconds.
4. From TS4, transmit ST.IdenticalBPDU2 frames every two seconds.
5. Wait 2 seconds.

Observable Results:

Part A:

- In step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to that in frames transmitted by TS1.

Part B:

- In step 5, TS1 and TS4 must capture a properly formatted ST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.
- In step 5, TS2 and TS3 must capture a properly formatted MST BPDU with CIST Root Identifier equal to the DUT's CIST Bridge Identifier.

Possible Problems: None.

Test MSTP.op.3.17 — VLAN Tagged BPDUs

Purpose: To verify that the DUT does not process tagged ST BPDUs.

References: [1] IEEE Std. 802.1Q-2011: sub-clause 8.13.10

Resource Requirements: 3 Test Stations capable of transmitting and receiving arbitrary MAC frames.

Discussion: Spanning Tree BPDUs transmitted by the Bridge ProtocolEntity are not forwarded by Bridges and must be visible to all other Bridge Protocol Entities attached to the same LAN segment. Such frames shall be transmitted Untagged; any BPDUs that carry a tag header are not recognized as well-formed BPDUs and are not forwarded by the Bridge.

Test Setup: Refer to the default test setup in Appendix A.

Test Procedure:

Part A: VLAN tagged BPDU

1. Ensure that the Default Test Values are configured on the DUT.
2. From TS1, transmit ST.MakeRootPortVLANTagged frames every two seconds.
3. Wait 2 seconds.

Observable Results:

Part A:

- In step 3, TS1, TS2 and TS3 must capture a properly formatted MST BPDU with a Root Identifier equal to the DUT's Bridge Identifier.

Possible Problems: None.

MSTI Port Priorities: **0x80**

MSTI Port Path Costs: **0x00030D40**

General Port Settings:*(all ports unless otherwise noted)*

OperEdge = **FALSE**

AdminEdge = **FALSE**

*****The DUT must be in the default test state at the start of each Test in this Group*****

*****Tests may be modified, if it is not possible to configure the device accordingly*****

Appendix B: Frame Document

Ethernet Switching Protocols Test Suite	91	Multiple Spanning Tree Operations
---	----	-----------------------------------

©2014 University of New Hampshire

MST.OtherRegionThanDUT		
A MST BPDU sent from a region other than the on the DUT is in.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	90 00 00 BF CB FC BF C2
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C2
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 02
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C2
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterMakeRootPort		
The receiving Port transitions to the RootPortRole.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.WorseRootIDThanDUT		
A MST BPDU with a worse CIST Root ID than the DUT.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	90 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadProtoID1		
A MST BPDU with a protocol ID of 0x0001.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 01
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadProtocolID2		
A MST BPDU with a Protocol ID of 0xBFC1.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	BF C1
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadProtocolID3		
A MST BPDU with a Protocol ID of 0xFFFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	FF FF
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadProtoVerID1		
A MST BPDU with a Protocol Version ID of 0x04.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	04
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadProtoVerID2		
A MST BPDU with a Protocol Version ID of 0x0F.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	0F
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadProtoVerID3		
A MST BPDU with a Protocol Version ID of 0xFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	FF
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadBPDUType1		
A MST BPDU with a BPDU Type of 0x01.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	01
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadBPDUType2		
A MST BPDU with a BPDU Type of 0x0F.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	0F
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBadBPDUType3		
A MST BPDU with a BPDU Type of 0xFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	FF
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraRootID0000_000000000000		
A MST BPDU with a CIST Root ID of 0x0000000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	00 00 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraRootID0001_000000000000		
A MST BPDU with a CIST Root ID of 0x0001000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	00 01 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraRootID7776_7777777777		
A MST BPDU with a CIST Root ID of 0x77767777777777.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	77 76 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraRootID7777_7777777777		
A MST BPDU with a CIST Root ID of 0x7777777777777777.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	77 77 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraRootID0000_000000000001		
A MST BPDU with a CIST Root ID of 0x0000000000000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	00 00 00 00 00 00 00 01
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraRootID7777_77777777776		
A MST BPDU with a CIST Root ID of 0x777777777777776.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	77 77 77 77 77 77 77 76
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterRootID0000_000000000000		
A MST BPDU with a CIST Root ID of 0x0000000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	00 00 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterRootID0001_000000000000		
A MST BPDU with a CIST Root ID of 0x0001000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	00 01 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterRootID7776_7777777777		
A MST BPDU with a CIST Root ID of 0x7776777777777777.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	77 76 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterRootID7777_7777777777		
A MST BPDU with a CIST Root ID of 0x7777777777777777.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	77 77 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterRootID0000_000000000001		
A MST BPDU with a CIST Root ID of 0x0000000000000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	00 00 00 00 00 00 00 01
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterRootID7777_7777777776		
A MST BPDU with a CIST Root ID of 0x77777777777776.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	77 77 77 77 77 77 77 76
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTRootPath00000000		
A MST BPDU with CIST External Path Cost of 0x00000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 00
35..42	CIST Regional Root Identifier	60 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	60 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTRootPath00000001		
A MST BPDU with CIST External Path Cost of 0x00000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 01
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C3
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTRootPath00000000		
A MST BPDU with CIST External Path Cost of 0x00000000.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 00
35..42	CIST Regional Root Identifier	60 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	60 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTRootPath00000001		
A MST BPDU with CIST External Path Cost of 0x00000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 01
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C3
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTRootPathFFFFFFFFE		
A MST BPDU with CIST External Path Cost of 0xFFFFFFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	FF FF FF FE
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTRootPathFFFFFFFF		
A MST BPDU with CIST External Path Cost of 0xFFFFFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	FF FF FF FF
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C3
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTBridgeID7776_7777777777		
A MST BPDU with a CIST Regional Root ID of 0x7776777777777777.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 76 77 77 77 77 77 77
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	77 77 77 77 77 77
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTBridgeID7777_777777777777		
A MST BPDU with a CIST Regional Root ID of 0x7777777777777777.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 77 77 77 77 77 77 77
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	77 77 77 77 77 77
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTBridgeIDFFFE_FFFFFFFF		
A MST BPDU with a CIST Regional Root ID of 0xFFFFEFFFFFFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	FF FE FF FF FF FF FF FF
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	FF FF FF FF FF FF
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTBridgeIDFFFF_FFFFFFFF		
A MST BPDU with a CIST Regional Root ID of 0xFFFFFFFFFFFFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	FF FF FF FF FF FF FF FF
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	FF FF FF FF FF FF
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTBridgeID7777_77777777776		
A MST BPDU with a CIST Regional Root ID of 0x777777777777776.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 77 77 77 77 77 77 76
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	77 77
113..118	CIST Bridge MAC Address of Transmitting Bridge	77 77 77 77 77 76
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTBridgeIDFFFF_FFFFFFFF		
A MST BPDU with a CIST Regional Root ID of 0xFFFFFFFFFFFFFE.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	FF FF FF FF FF FF FF FE
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	FF FF
113..118	CIST Bridge MAC Address of Transmitting Bridge	FF FF FF FF FF FE
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTBridgeID7776_7777777777		
A MST BPDU with a CIST Regional Root ID of 0x7776777777777777.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 76 77 77 77 77 77 77
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	77 76
113..118	CIST Bridge MAC Address of Transmitting Bridge	77 77 77 77 77 77
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTBridgeID7777_777777777777		
A MST BPDU with a CIST Regional Root ID of 0x7777777777777777.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 77 77 77 77 77 77 77
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	77 77
113..118	CIST Bridge MAC Address of Transmitting Bridge	77 77 77 77 77 77
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.PortID0000		
A MST BPDU with a CIST Port ID of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	00 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.PortID0100		
A MST BPDU with a CIST Port ID of 0x0100.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	01 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.PortID0101		
A MST BPDU with a CIST Port ID of 0x0101.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	01 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.PortIDF000		
A MST BPDU with a CIST Port ID of 0xF000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	F0 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.PortIDF001		
A MST BPDU with a CIST Port ID of 0xF001.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	F0 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.PortIDFFFE		
A MST BPDU with a CIST Port ID of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FE
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.PortIDFFFF		
A MST BPDU with a CIST Port ID of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FF
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraMessageAge_0000		
A MST BPDU with a Message Age of 0x0000.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	00 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraMessageAge_0001		
A MST BPDU with a Message Age of 0x0001.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	00 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraMessageAge_1200		
A MST BPDU with a Message Age of 0x1200.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	12 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraMessageAge_1201		
A MST BPDU with a Message Age of 0x1201.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	12 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraMessageAge_1300		
A MST BPDU with a Message Age of 0x1300.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	13 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraMessageAge_1400		
A MST BPDU with a Message Age of 0x1400.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	14 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterMessageAge_2000		
A MST BPDU with a Message Age of 0x2000.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	20 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterMessageAge_2001		
A MST BPDU with a Message Age of 0x2001.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	20 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterMessageAge_FFFE		
A MST BPDU with a Message Age of 0xFFFE.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	FF FE
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterMessageAge_FFFF		
A MST BPDU with a Message Age of 0xFFFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	FF FF
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_0600		
A MST BPDU with a Max Age of 0x0600.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_0601		
A MST BPDU with a Max Age of 0x0601.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 01
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_06FF		
A MST BPDU with a Max Age of 0x06FF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 FF
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_0700		
A MST BPDU with a Max Age of 0x0700.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	07 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_2800		
A MST BPDU with a Max Age of 0x2800.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_2801		
A MST BPDU with a Max Age of 0x2801.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 01
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_0500		
A MST BPDU with a Max Age of 0x0500.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	05 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_0501		
A MST BPDU with a Max Age of 0x0501.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	05 01
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_FFFE		
A MST BPDU with a Max Age of 0xFFFE.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	FF FE
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MaxAge_FFFF		
A MST BPDU with a Max Age of 0xFFFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	FF FF
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_0400		
A MST BPDU with a Forward Delay of 0x0400.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	04 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_0401		
A MST BPDU with a Forward Delay of 0x0401.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	04 01
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_1DFF		
A MST BPDU with a Forward Delay of 0x1DFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	1D FF
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_1E00		
A MST BPDU with a Forward Delay of 0x1E00.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_1E01		
A MST BPDU with a Forward Delay of 0x1E01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 01
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_1E02		
A MST BPDU with a Forward Delay of 0x1E02.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 02
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_FFFE		
A MST BPDU with a Forward Delay of 0xFFFE.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	FF FE
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.FwdDelay_FFFF		
A MST BPDU with a Forward Delay of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	FF FF
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBigMsgTimes1		
A MST BPDU with maximum Message Times values.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 00
49..50	Hello Time	0A 00
51..52	Forward Delay	1E 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBigMsgTimes2		
A MST BPDU with greater than maximum Message Times values.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 01
49..50	Hello Time	0A 01
51..52	Forward Delay	1E 01
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortLength1		
A MST BPDU with a Length/Type of 0x0068.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 68
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortLength2		
A MST BPDU with a Length/Type of 0x0011.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 11
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortLength3		
A MST BPDU with a Length/Type of 0x0000.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 00
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBPDULength1,2,3,4,5		
Set Packet Length in Ixia to __, __, __, and __		
Field (Octet(s))	Value (Hexadecimal)	
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IdenticalBPDU1		
A MST BPDU with a specified source MAC address.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	00 88 88 88 88 88
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IdenticalBPDU2		
A MST BPDU with a specified source MAC address and a worse CIST Root ID than the DUT.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	00 88 88 88 88 88
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	90 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTIntPathCost_00000001		
A MST BPDU with a CIST Internal Root Path Cost of 0x00000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 01
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTIntPathCost_00000002		
A MST BPDU with a CIST Internal Root Path Cost of 0x00000002.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 02
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTIntPathCost_EEEEEEEE		
A MST BPDU with a CIST Internal Root Path Cost of 0xEEEEEEEE.		
Field (Octet(s))	Value (Hexadecimal)	
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	EE EE EE EE
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTIntPathCost_EEEEEEEF		
A MST BPDU with a CIST Internal Root Path Cost of 0xEEEEEEEF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	EE EE EE EF
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTIntPathCost_FFFFFFFE		
A MST BPDU with a CIST Internal Root Path Cost of 0xFFFFFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	FF FF FF FE
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraCISTIntPathCost_FFFFFFFF		
A MST BPDU with a CIST Internal Root Path Cost of 0xFFFFFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	FF FF FF FF
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTIntPathCost_00000001		
A MST BPDU with a CIST Internal Root Path Cost of 0x00000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 01
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTIntPathCost_00000002		
A MST BPDU with a CIST Internal Root Path Cost of 0x00000002.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 02
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTIntPathCost_EEEEEEEE		
A MST BPDU with a CIST Internal Root Path Cost of 0xEEEEEEEE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	EE EE EE EE
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTIntPathCost_EEEEEEEF		
A MST BPDU with a CIST Internal Root Path Cost of 0xEEEEEEEF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	EE EE EE EF
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTIntPathCost_FFFFFFFE		
A MST BPDU with a CIST Internal Root Path Cost of 0xFFFFFFE.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	FF FF FF FE
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.InterCISTIntPathCost_FFFFFFFF		
A MST BPDU with a CIST Internal Root Path Cost of 0xFFFFFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C1
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 40
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	FF FF FF FF
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortBigV3Length		
A MST BPDU with a Version Three Length of 0xFFFF.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	FF FF
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortSmallV3Length		
A MST BPDU with a Version Three Length of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 01
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.MakeRootPortInvalidV3Length		
A MST BPDU with a Version Three Length of 0x0055.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 55
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..123	Frame Check Sequence	Calculated at runtime

MST.IntraMSTIRootID001		
A MST BPDU containing MSTI 1 information and a MSTI 1 Bridge Identifier Priority of 0x60.		
	Field (Octet(s))	Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 50
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..	MSTI 1 Flags	7C
121..128	MSTI 1 Regional Root Identifier	60 01 00 BF CB FC BF C0
129..132	MSTI 1 Internal Root Path Cost	00 00 00 00
133..	MSTI 1 Bridge Identifier Priority	60
134..	MSTI 1 Port Identifier Priority	80
135..	MSTI 1 Remaining Hops	14
136..139	Frame Check Sequence	Calculated at runtime

MST.InterMSTIRootID001		
A MST BPDU containing MSTI 1 information and a MSTI 1 Bridge Identifier Priority of 0x80.		
Field (Octet(s))	Value (Hexadecimal)	
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 50
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 01
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..	MSTI 1 Flags	7C
121..128	MSTI 1 Regional Root Identifier	60 01 00 BF CB FC BF C0
129..132	MSTI 1 Internal Root Path Cost	00 00 00 00
133..	MSTI 1 Bridge Identifier Priority	80
134..	MSTI 1 Port Identifier Priority	80
135..	MSTI 1 Remaining Hops	14
136..139	Frame Check Sequence	Calculated at runtime

MST.IntraMSTI001PathCost_00030D40		
A MST BPDU containing MSTI 1 information and a MSTI 1 Internal Root Path Cost of 0x00030D40		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 50
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..	MSTI 1 Flags	7C
121..128	MSTI 1 Regional Root Identifier	60 01 00 BF CB FC BF C0
129..132	MSTI 1 Internal Root Path Cost	00 03 0D 40
133..	MSTI 1 Bridge Identifier Priority	80
134..	MSTI 1 Port Identifier Priority	80
135..	MSTI 1 Remaining Hops	14
136..139	Frame Check Sequence	Calculated at runtime

MST.IntraMSTI001RemainingHops_13		
A MST BPDU containing MSTI 1 information and a MSTI 1 Remaining hops of 0x13.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 50
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..	MSTI 1 Flags	7C
121..128	MSTI 1 Regional Root Identifier	60 01 00 BF CB FC BF C0
129..132	MSTI 1 Internal Root Path Cost	00 00 00 00
133..	MSTI 1 Bridge Identifier Priority	80
134..	MSTI 1 Port Identifier Priority	80
135..	MSTI 1 Remaining Hops	13
136..139	Frame Check Sequence	Calculated at runtime

MST.IntraMSTI001RemainingHops_02		
A MST BPDU containing MSTI 1 information and a MSTI 1 Remaining hops of 0x02.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
..	VLAN Tag Header	None
13..14	Length/Type	00 69
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	03
21..	BPDU Type	02
22..	CIST Flags	7C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..55	Version Three Length	00 50
56..	Configuration ID Format Selector	00
57..88	Configuration Name	55 4E 48 2D 49 4F 4C 3A 42 46 43 00
89..90	Revision Level	00 00
91..106	Configuration Digest	DF 54 82 2E B6 20 80 25 E3 5A 8E B5 4A 92 87 2A
107..110	CIST Internal Root Path Cost	00 00 00 00
111..112	CIST Bridge Priority of Transmitting Bridge	F0 00
113..118	CIST Bridge MAC Address of Transmitting Bridge	00 BF CB FC BF C0
119..	Remaining Hops	14
120..	MSTI 1 Flags	7C
121..128	MSTI 1 Regional Root Identifier	60 01 00 BF CB FC BF C0
129..132	MSTI 1 Internal Root Path Cost	00 00 00 00
133..	MSTI 1 Bridge Identifier Priority	80
134..	MSTI 1 Port Identifier Priority	80
135..	MSTI 1 Remaining Hops	01
136..139	Frame Check Sequence	Calculated at runtime

RST.MakeRootPort		
The receiving Port transitions to the RootPortRole.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	01
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.WorseRootIDThanDUT		
A RST BPDU with a worse CIST Root ID than the DUT.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	90 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBadProtoID1		
A RST BPDU with a Protocol ID of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 01
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBadProtoID2		
A RST BPDU with a Protocol ID of 0xBFC1.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	BF C1
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBadProtoID3		
A RST BPDU with a Protocol ID of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	FF FF
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBadBPDUType1		
A RST BPDU with a BPDU Type of 0x01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	01
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBadBPDUType2		
A RST BPDU with a BPDU Type of 0x0F.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	0F
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBadBPDUType3		
A RST BPDU with a BPDU Type of 0xFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	FF
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.RootID0000_000000000000		
A RST BPDU with a CIST Root ID of 0x0000000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	00 00 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.RootID0001_000000000000		
A RST BPDU with a CIST Root ID of 0x0001000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	00 01 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.RootID7776_7777777777		
A RST BPDU with a CIST Root ID of 0x7776777777777777.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	77 76 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.RootID7777_777777777777		
A RST BPDU with a CIST Root ID of 0x7777777777777777.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	77 77 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.RootID0000_000000000001		
A RST BPDU with a CIST Root ID of 0x0000000000000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	00 00 00 00 00 00 00 01
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.RootID7777_77777777776		
A RST BPDU with a CIST Root ID of 0x777777777777776.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	77 77 77 77 77 77 77 76
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTRootPath00000000		
A RST BPDU with a CIST External Root Path Cost of 0x00000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 00
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTRootPath00000001		
A RST BPDU with a CIST External Root Path Cost of 0x00000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 01
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C3
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTRootPathFFFFFFFFE		
A RST BPDU with a CIST External Root Path Cost of 0xFFFFFFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	FF FF FF FF
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C3
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTRootPathFFFFFFFF		
A RST BPDU with a CIST External Root Path Cost of 0xFFFFFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	FF FF FF FE
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C3
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeID0000_000000000000		
A RST BPDU with a CIST Regional Root ID of 0x0000000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	00 00 00 00 00 00 00 00
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeID0001_000000000000		
A RST BPDU with a CIST Regional Root ID of 0x0001000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	00 01 00 00 00 00 00 00
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeID7776_7777777777		
A RST BPDU with a CIST Regional Root ID of 0x7776777777777777.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 76 77 77 77 77 77 77
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeID7777_777777777777		
A RST BPDU with a CIST Regional Root ID of 0x7777777777777777.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 77 77 77 77 77 77 77
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeIDFFFE_FFFFFFFF		
A RST BPDU with a CIST Regional Root ID of 0xFFFEFFFFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	FF FE FF FF FF FF FF FF
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeIDFFFF_FFFFFFFF		
A RST BPDU with a CIST Regional Root ID of 0xFFFFFFFFFFFFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	FF FF FF FF FF FF FF FF
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeID7777_77777777776		
A RST BPDU with a CIST Regional Root ID of 0x777777777777776.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 77 77 77 77 77 77 76
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.CISTBridgeIDFFFF_FFFFFFFF		
A RST BPDU with a CIST Regional Root ID of 0xFFFFFFFFFFFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	FF FF FF FF FF FF FE
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortID0000		
A RST BPDU with a CIST Port ID of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	00 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortID0001		
A RST BPDU with a CIST Port ID of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	00 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortID0100		
A RST BPDU with a CIST Port ID of 0x0100.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	01 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortID0101		
A RST BPDU with a CIST Port ID of 0x0101.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	01 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortIDF000		
A RST BPDU with a CIST Port ID of 0xF000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	F0 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortIDF001		
A RST BPDU with a CIST Port ID of 0xF001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	F0 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortIDFFFE		
A RST BPDU with a CIST Port ID of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FE
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.PortIDFFFF		
A RST BPDU with a CIST Port ID of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FF
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAge0000		
A RST BPDU with a Message Age of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	00 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAge0001		
A RST BPDU with a Message Age of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	00 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAge1200		
A RST BPDU with a Message Age of 0x1200.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	12 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAge1201		
A RST BPDU with a Message Age of 0x1201.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	12 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAge2000		
A RST BPDU with a Message Age of 0x2000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	20 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAge2001		
A RST BPDU with a Message Age of 0x2001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	20 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAgeFFFE		
A RST BPDU with a Message Age of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FE
45..46	Message Age	20 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAgeFFFF		
A RST BPDU with a Message Age of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FF
45..46	Message Age	20 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MessageAge1400		
A RST BPDU with a Message Age of 0x1400.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	14 00
45..46	Message Age	20 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAge0600		
A RST BPDU with a Max Age of 0x0600.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAge0601		
A RST BPDU with a Max Age of 0x0601.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 01
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAge06FF		
A RST BPDU with a Max Age of 0x06FF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 FF
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAge0700		
A RST BPDU with a Max Age of 0x0700.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	07 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAge0500		
A RST BPDU with a Max Age of 0x0500.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	05 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAge0501		
A RST BPDU with a Max Age of 0x0501.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	05 01
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAgeFFFE		
A RST BPDU with a Max Age of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	FF FE
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MaxAgeFFFF		
A RST BPDU with a Max Age of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	FF FF
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.Hello_0000		
A RST BPDU with a Hello Time of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	00 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.Hello_0001		
A RST BPDU with a Hello Time of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	00 01
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.Hello_0A00		
A RST BPDU with a Hello Time of 0x0A00.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	17 00
49..50	Hello Time	0A 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.Hello_0A01		
A RST BPDU with a Hello Time of 0x0A01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	17 00
49..50	Hello Time	0A 01
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.Hello_0F00		
A RST BPDU with a Hello Time of 0x0F00.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	21 00
49..50	Hello Time	0F 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.Hello_0F01		
A RST BPDU with a Hello Time of 0x0F01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	21 00
49..50	Hello Time	0F 01
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_0400		
A RST BPDU with a Forward Delay of 0x0400.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	01 00
51..52	Forward Delay	04 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_0401		
A RST BPDU with a Forward Delay of 0x0401.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	01 00
51..52	Forward Delay	04 01
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_1DFF		
A RST BPDU with a Forward Delay of 0x1DFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1D FF
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_1E00		
A RST BPDU with a Forward Delay of 0x1E00.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_1E01		
A RST BPDU with a Forward Delay of 0x1E01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 01
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_1E02		
A RST BPDU with a Forward Delay of 0x1E02.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 02
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_FFFE		
A RST BPDU with a Forward Delay of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	FF FE
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.FwdDelay_FFFF		
A RST BPDU with a Forward Delay of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	FF FF
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBigMsgTimes1		
A RST BPDU with the Maximum Message Times values.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 00
49..50	Hello Time	0A 00
51..52	Forward Delay	1E 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBigMsgTimes2		
A RST BPDU with greater than Maximum Message Times values.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 01
49..50	Hello Time	0A 01
51..52	Forward Delay	1E 01
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortLength1		
A RST BPDU with a Length/Type of 0x0026.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortLength2		
A RST BPDU with a Length/Type of 0x0011.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 11
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortLength3		
A RST BPDU with a Length/Type of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 00
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.MakeRootPortBPDULength1,2,3,4,5		
Set packet length in Ixia to __, __, __, and __		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.IdenticalBPDU1		
A MST BPDU with a specified source MAC address.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	00 88 88 88 88 88
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

RST.IdenticalBPDU2		
A MST BPDU with a specified source MAC address and a worse CIST Root ID than the DUT.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	00 88 88 88 88 88
-	VLAN Tag Header	None
13..14	Length/Type	00 27
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	02
21..	BPDU Type	02
22..	CIST Flags	3C
23..30	CIST Root Identifier	90 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPort		
The receiving Port transitions to the RootPortRole.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.WorseRootIDthanDUT		
A ST BPDU with a worse CIST Root ID than the DUT.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	90 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBadProtoID1		
A ST BPDU with a Protocol ID of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 01
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBadProtoID2		
A ST BPDU with a Protocol ID of 0xBFC1.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	BF C1
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBadProtoID3		
A ST BPDU with a Protocol ID of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	FF FF
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.TCN_BadProtoID		
A ST TCN BPDU with a Protocol ID of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 07
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 01
20..	Protocol Version Identifier	00
21..	BPDU Type	80
22..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.TCN_BPDU		
A ST TCN BPDU.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 07
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	80
22..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBadBPDUType1		
A ST BPDU with a BPDU Type of 0x01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	01
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBadBPDUType2		
A ST BPDU with a BPDU Type of 0x0F.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	0F
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBadBPDUType3		
A ST BPDU with a BPDU Type of 0xFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	FF
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.TC_TCackBPDU		
A ST BPDU with the CIST Flags of 0x81.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	81
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.RootID0000_000000000000		
A ST BPDU with a CIST Root ID of 0x0000000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	00 00 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.RootID0001_000000000000		
A ST BPDU with a CIST Root ID of 0x0001000000000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	00 01 00 00 00 00 00 00
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.RootID7776_7777777777		
A ST BPDU with a CIST Root ID of 0x7776777777777777.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	77 76 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.RootID7777_777777777777		
A ST BPDU with a CIST Root ID of 0x7777777777777777.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	77 77 77 77 77 77 77 77
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.RootID0000_000000000001		
A ST BPDU with a CIST Root ID of 0x0000000000000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	00 00 00 00 00 00 00 01
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C4
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.RootID7777_777777777776		
A ST BPDU with a CIST Root ID of 0x7777777777777776.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	77 77 77 77 77 77 77 76
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.CISTRootPath00000000		
A ST BPDU with a CIST External Path Cost of 0x00000000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 00
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.CISTRootPath00000001		
A ST BPDU with a CIST External Path Cost of 0x00000001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 00 00 01
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C4
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.CISTBridgeID7777_77777777776		
A ST BPDU with a CIST Regional Root ID of 0x777777777777776.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	77 77 77 77 77 77 77 76
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.CISTBridgeIDFFFF_FFFFFFFF		
A ST BPDU with a CIST Regional Root ID of 0xFFFFFFFFFFFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	FF FF FF FF FF FF FE
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_0000		
A ST BPDU with a CIST Port ID of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	00 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_0001		
A ST BPDU with a CIST Port ID of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	00 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_0100		
A ST BPDU with a CIST Port ID of 0x0100.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	01 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_0101		
A ST BPDU with a CIST Port ID of 0x0101.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	01 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_F000		
A ST BPDU with a CIST Port ID of 0xF000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	F0 00
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_F001		
A ST BPDU with a CIST Port ID of 0xF001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	F0 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_FFFE		
A ST BPDU with a CIST Port ID of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FE
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.PortID_FFFF		
A ST BPDU with a CIST Port ID of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	FF FF
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_0000		
A ST BPDU with a Message Age of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	00 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_0001		
A ST BPDU with a Message Age of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	00 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_1200		
A ST BPDU with a Message Age of 0x1200.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	12 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_1201		
A ST BPDU with a Message Age of 0x1201.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	12 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_2000		
A ST BPDU with a Message Age of 0x2000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	20 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_2001		
A ST BPDU with a Message Age of 0x2001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	20 01
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_FFFE		
A ST BPDU with a Message Age of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	FF FE
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_FFFF		
A ST BPDU with a Message Age of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	FF FF
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MessageAge_1400		
A ST BPDU with a Message Age of 0x1400.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	14 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_0600		
A ST BPDU with a Max Age of 0x0600.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	02 00
51..52	Forward Delay	05 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_0601		
A ST BPDU with a Max Age of 0x0601.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 01
49..50	Hello Time	02 00
51..52	Forward Delay	05 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_06FF		
A ST BPDU with a Max Age of 0x06FF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 FF
49..50	Hello Time	02 00
51..52	Forward Delay	05 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_0700		
A ST BPDU with a Max Age of 0x0700.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	07 00
49..50	Hello Time	02 00
51..52	Forward Delay	05 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_0500		
A ST BPDU with a Max Age of 0x0500.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	05 00
49..50	Hello Time	02 00
51..52	Forward Delay	04 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_0501		
A ST BPDU with a Max Age of 0x0501.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	05 01
49..50	Hello Time	02 00
51..52	Forward Delay	04 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_FFFE		
A ST BPDU with a Max Age of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	FF FE
49..50	Hello Time	02 00
51..52	Forward Delay	08 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MaxAge_FFFF		
A ST BPDU with a Max Age of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	FF FF
49..50	Hello Time	02 00
51..52	Forward Delay	08 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.Hello_0000		
A ST BPDU with a Hello Time of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	00 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.Hello_0001		
A ST BPDU with a Hello Time of 0x0001.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	00 01
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.Hello_0A00		
A ST BPDU with a Hello Time of 0x0A00.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	17 00
49..50	Hello Time	0A 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.Hello_0A01		
A ST BPDU with a Hello Time of 0x0A01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	17 00
49..50	Hello Time	0A 01
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.Hello_0F00		
A ST BPDU with a Hello Time of 0x0F00.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	21 00
49..50	Hello Time	0F 00
51..52	Forward Delay	12 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.Hello_0F01		
A ST BPDU with a Hello Time of 0x0F01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	21 00
49..50	Hello Time	0F 01
51..52	Forward Delay	12 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_0400		
A ST BPDU with a Forward Delay of 0x0400.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	01 00
51..52	Forward Delay	04 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_0401		
A ST BPDU with a Forward Delay of 0x0401.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	06 00
49..50	Hello Time	01 00
51..52	Forward Delay	04 01
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_1DFF		
A ST BPDU with a Forward Delay of 0x1DFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1D FF
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_1E00		
A ST BPDU with a Forward Delay of 0x1E00.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_1E01		
A ST BPDU with a Forward Delay of 0x1E01.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 01
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_1E02		
A ST BPDU with a Forward Delay of 0x1E02.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	1E 02
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_FFFE		
A ST BPDU with a Forward Delay of 0xFFFE.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	FF FE
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.FwdDelay_FFFF		
A ST BPDU with a Forward Delay of 0xFFFF.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	FF FF
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBigMsgTimes1		
A ST BPDU with maximum Message Times values.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 00
49..50	Hello Time	0A 00
51..52	Forward Delay	1E 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortBigMsgTimes2		
A ST BPDU with greater than maximum Message Times values.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	28 01
49..50	Hello Time	0A 01
51..52	Forward Delay	1E 01
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortLength1		
A ST BPDU with a Length/Type of 0x0025.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 25
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortLength2		
A ST BPDU with a Length/Type of 0x0011.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 11
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.MakeRootPortLength3		
A ST BPDU with a Length/Type of 0x0000.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	<TS Source MAC>
-	VLAN Tag Header	None
13..14	Length/Type	00 00
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.IdenticalBPDU1		
A ST BPDU with a specified source MAC address.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	00 88 88 88 88 88
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	60 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime

ST.IdenticalBPDU2		
A ST BPDU with a specified source MAC address and a worse CIST Root ID than the DUT.		
Field (Octet(s))		Value (Hexadecimal)
01..06	Destination MAC Address	01 80 C2 00 00 00
07..12	Source MAC Address	00 88 88 88 88 88
-	VLAN Tag Header	None
13..14	Length/Type	00 26
15..17	Logical Link Control	42 42 03
18..19	Protocol Identifier	00 00
20..	Protocol Version Identifier	00
21..	BPDU Type	00
22..	CIST Flags	00
23..30	CIST Root Identifier	90 00 00 BF CB FC BF C0
31..34	CIST External Path Cost	00 03 0D 40
35..42	CIST Regional Root Identifier	F0 00 00 BF CB FC BF C0
43..44	CIST Port Identifier	80 01
45..46	Message Age	01 00
47..48	Max Age	14 00
49..50	Hello Time	02 00
51..52	Forward Delay	0F 00
53..	Version One Length	00
54..60	Pad	All zeros
61..64	Frame Check Sequence	Calculated at runtime