



LXI Conformance Testing

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Contents

- New Feature
- Class C equipment needs
- Class B additional equipment
- Class A additional equipment
- Software pieces for the LXI Conformance Test Suite
- Directory Structure
- Conformance test suite
 - What it does
 - Types of tests
 - Knowledge capture (for more consistent testing)
 - Editor for test updates (LXI Spec version changes)
- Conformance Test Screen Shots and Usage Suggestions

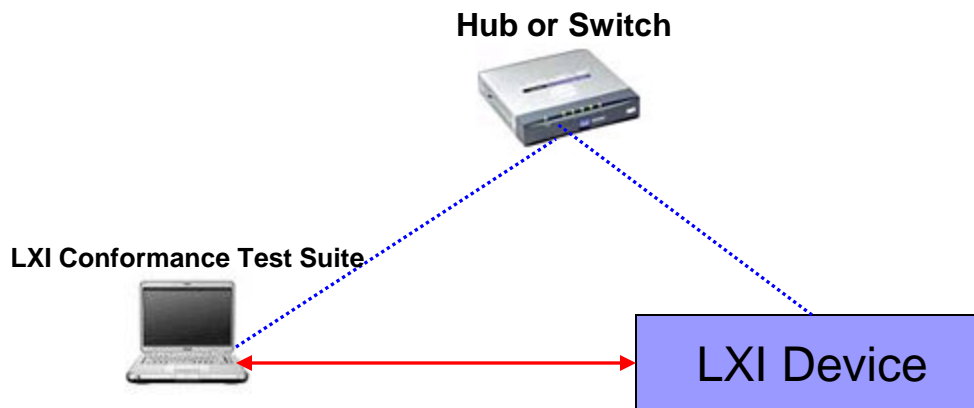
New Feature—DHCP Server Included

- A suitable DHCP server has been found and a control program written to manipulate it.
- If you want to use this feature, it expects the PC to be assigned a static address at: 192.168.1.99. Failure to do this results in the DHCP server not working correctly with the LXI Conformance Test Suite.
- If the DHCP Control program cannot bind to the DHCP Client socket, i.e. you are on a subnet that already has a DHCP Server, the supplied DHCP Server will not be started.

Class C Equipment Needs

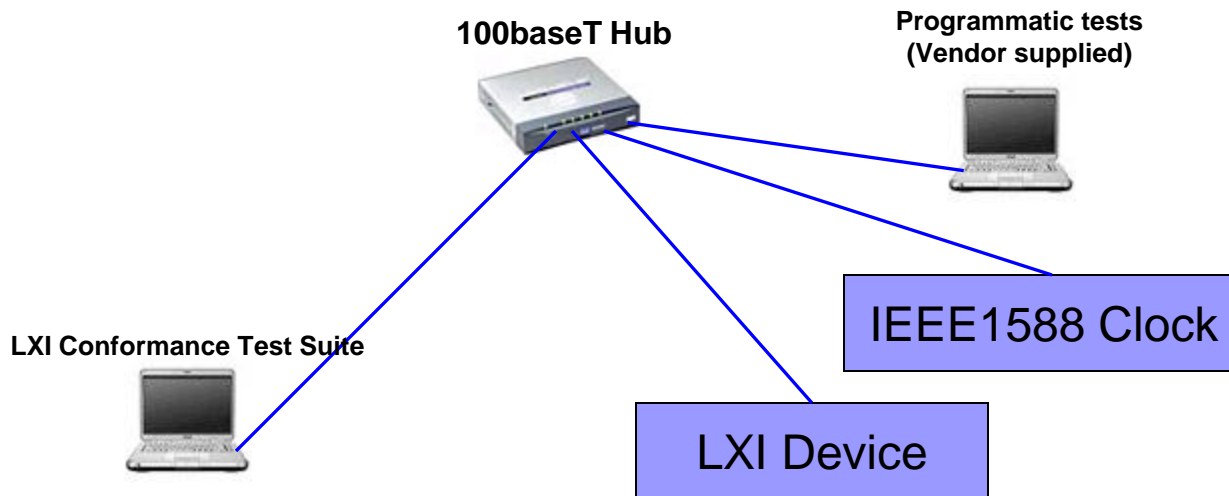
(Including LAN Triggers)

- PC with appropriate software
 - LXI Conformance Test Suite, DHCP Server, Perl, Apache, W3 Validator, VCSExpress, Win2k/XP, Bonjour, Wireshark,...
- Optional Hub, Switch or Crossover cable (if the PC doesn't support AutoMDIX or for programmatic testing)
- LXI Device to be tested



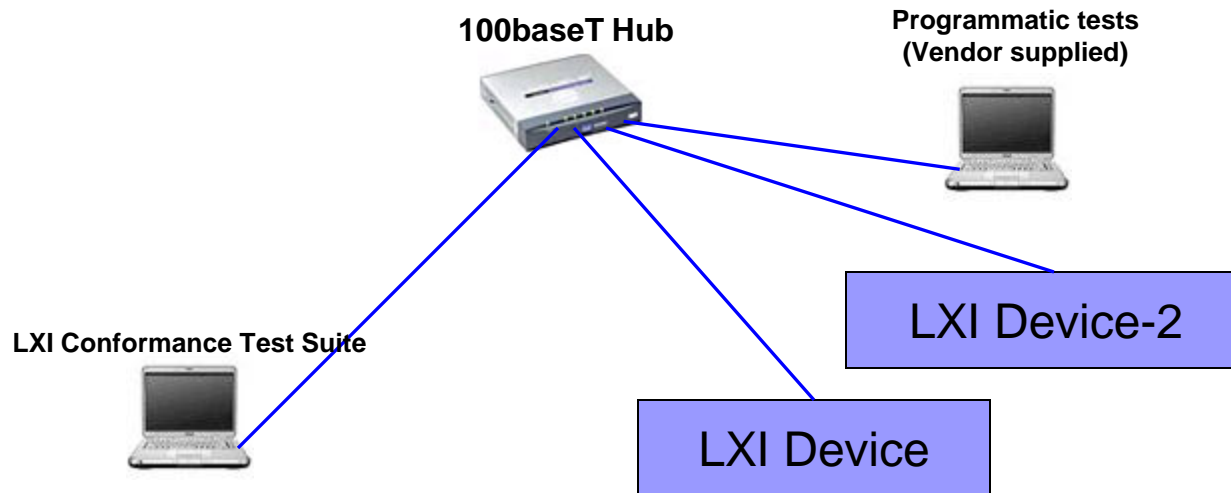
Class B Additional Equipment Needs

- Hub or switch is required for multiple devices
- LXI Device to be tested
- An additional IEEE1588 clock (or a second example of the LXI Device to be tested).
- Optional: Oscilloscope for Pulse Per Second testing.

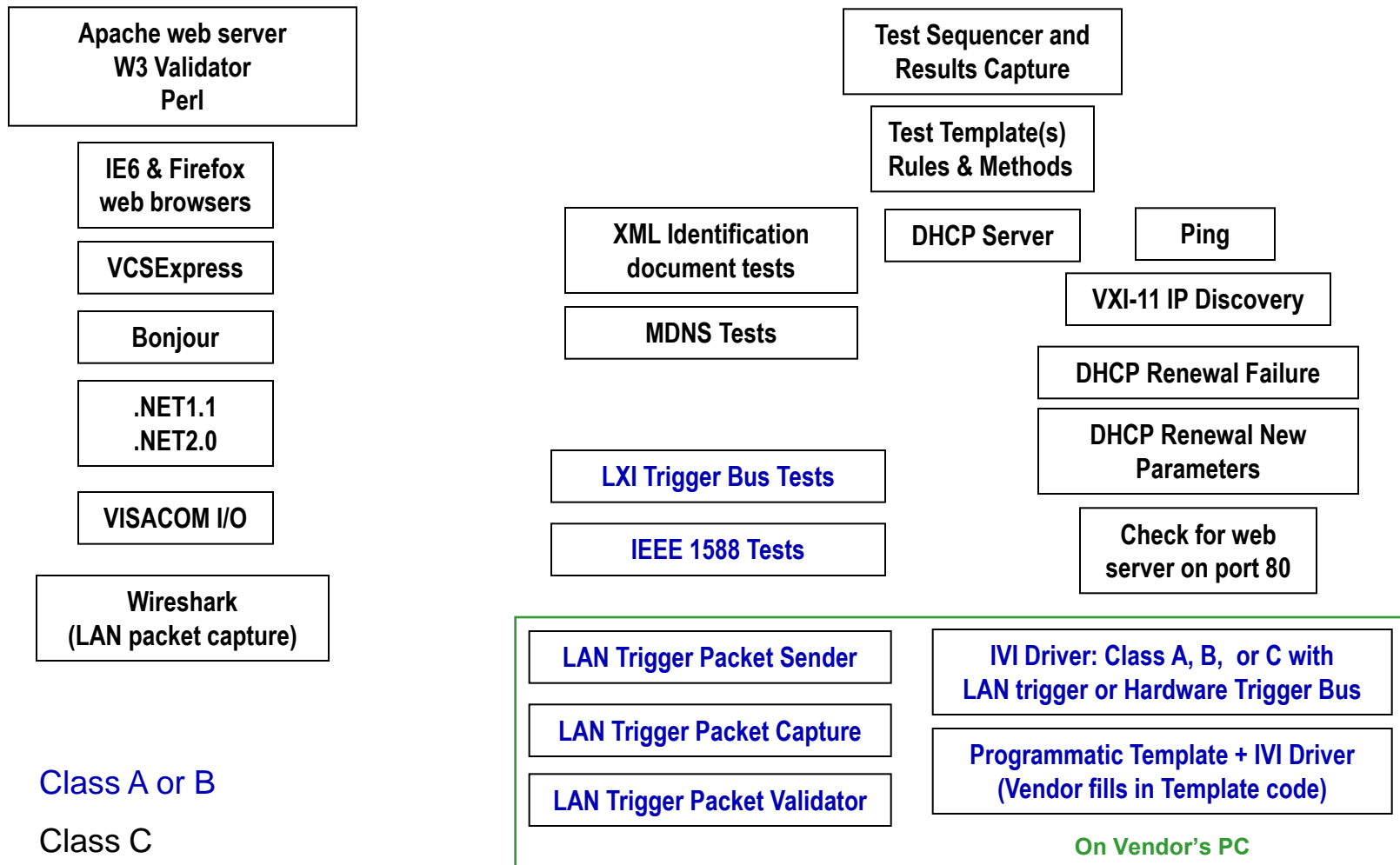


Class A Additional Equipment Needs

- Picking LXI Trigger Bus test adapters and cables.
- Oscilloscope for waveform and voltage level testing.
- Two examples of the LXI Device to be tested.



Software Pieces for Conformance Testing



Conformance Test Suite Directory Structure

- ConformanceTest—contains the test sequencer, help file, test templates, and tests for class C. The name of this directory is the user's choice. The first two subdirectories will be created when the zip file is unpacked.
 - 1588 – contains the IEEE1588 tests.
 - DualServer – contains the DHCP server.
 - Recommendation: create a subdirectory for test data.

- Other programs:
 - W3 Validator (including Perl and Apache) should be installed per the instructions from W3 in C:\www
 - Wireshark, Bonjour, VCSExpress, VISA IO, .NET1.1, and .NET2.0 can be installed wherever you choose (the defaults work nicely).

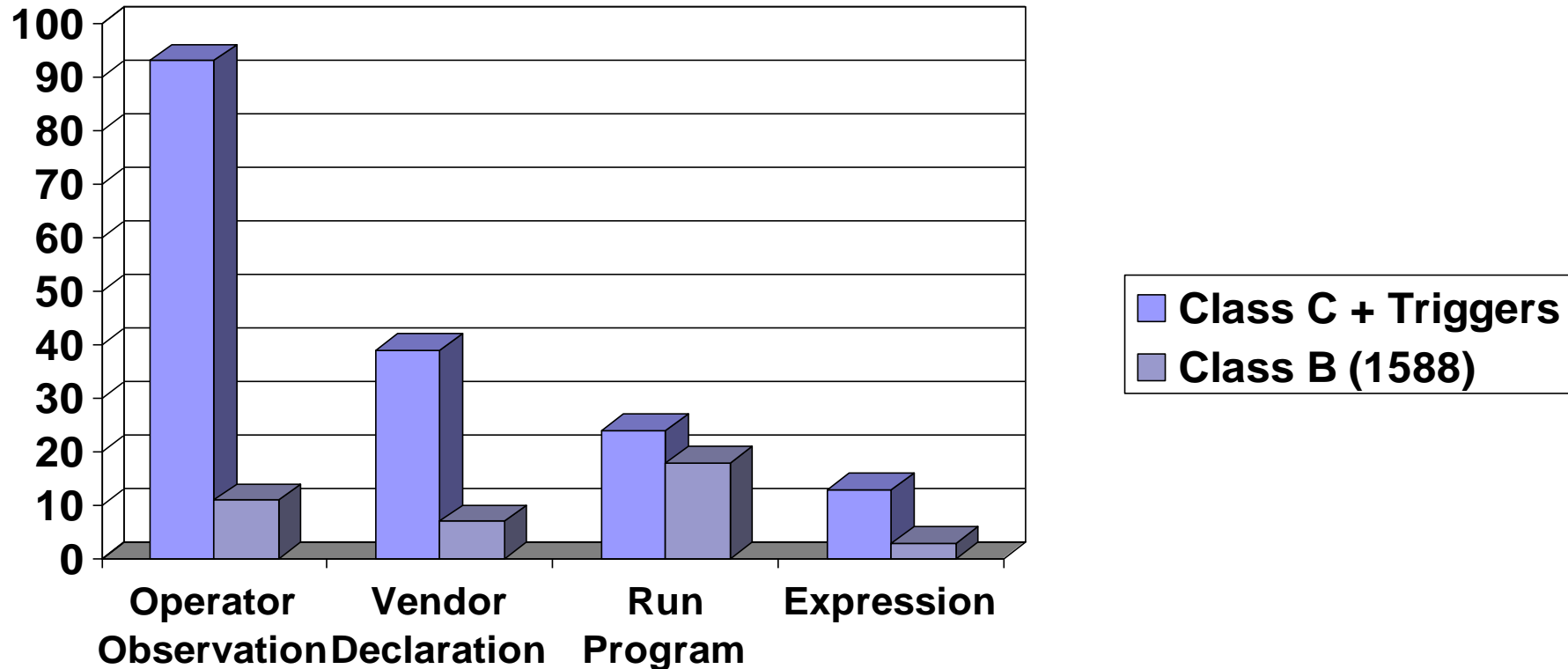
Conformance Test Suite—What it Does

- Captures Data and Description of LXI Device being tested
- Sequences tests per LXI Test Procedure
 - Shows ongoing status
 - Summarizes status on rule and chapter basis
 - Status values: Pass, Fail, Todo, NA
 - Shows Rule being tested and method of test
 - Provides a place to capture test result details.
 - Order of tests controlled by test template file (XML)
- Saves test results to an XML file
 - Can reload test results for further study or testing
- Provides edit capability for updating test template(s)—for template developers only.

Types of Tests

- Three built-in tests:
 - Operator Observation
 - Requires knowledge and judgment by operator
 - Vendor Declaration
 - Expression Evaluation
 - Result for rule is logical combination of other rules
- External tests:
 - Runs test program for a specific rule
 - Specified in the test template file
 - Can be written in any programming language

Types of Tests - Statistics



Knowledge Capture

- Purpose: Provide guidance for the non-expert user.
- Method: Provide instructions to the test operator.
 - Test setup
 - How to determine if test passes.
 - Reminder and a place to document items that don't work
 - For the device developers.
- Provide automated test programs where practical
 - Discovery (VXI-11, mDNS, XML Identification documents, *IDN?)
 - DHCP renewal tests
 - Web server port verification
 - IEEE 1588 tests

Editor for Test Templates

- Chapter Summary: Logic expression (of chapters)
- Chapter:
 - Number
 - Title
 - Logic expression (of rules in chapter)
- Rule:
 - Paragraph Number & Title
 - Rule Text
 - Test Instructions
 - Rule Qualifiers:
 - LXI Class, Physical type, Conformance Method, etc.
 - Test type:
 - Operator Observation, Vendor Declaration, Expression, External Test Program plus parameters

Test Template Editor—Screen

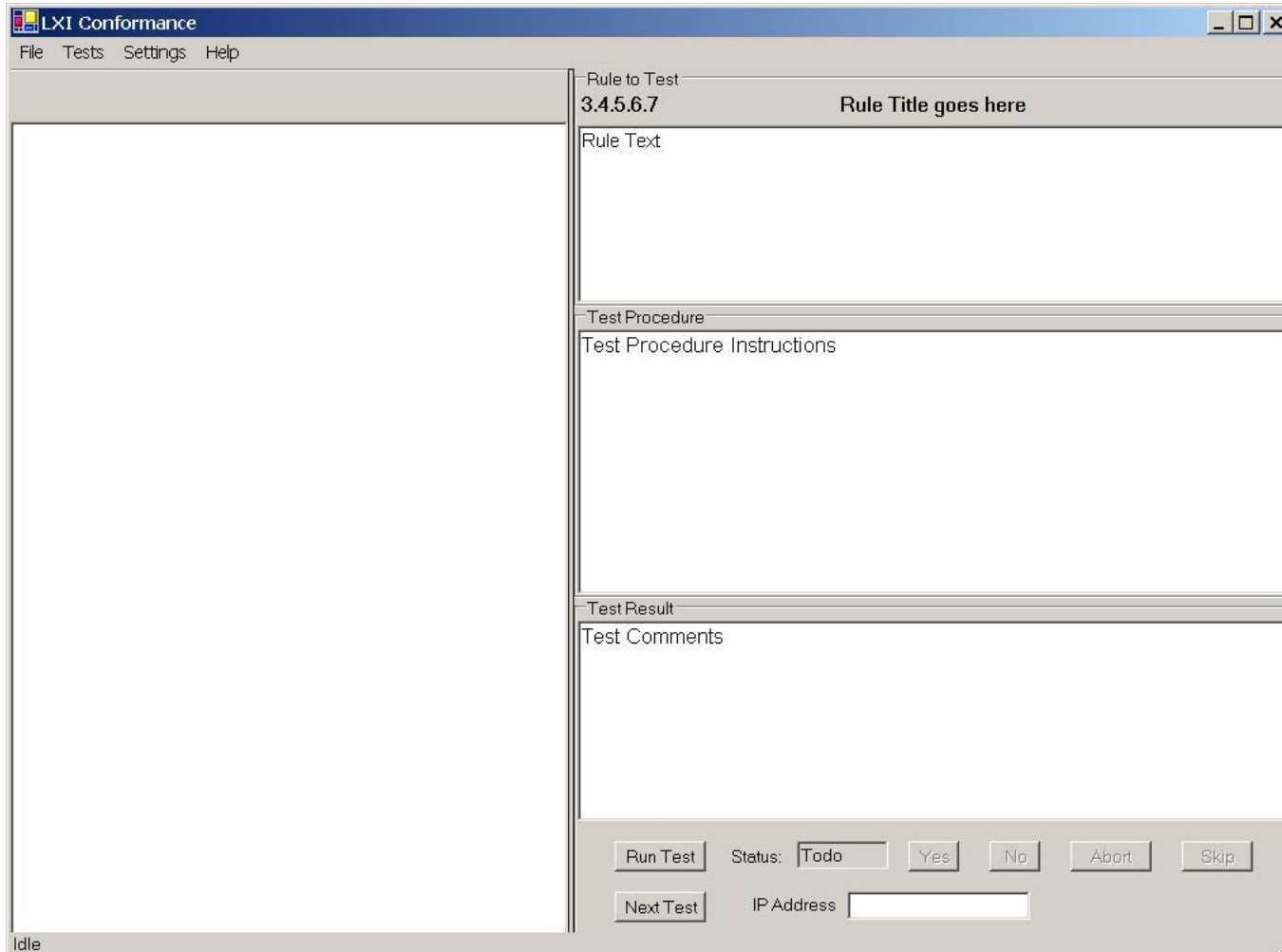
The screenshot shows the 'Test Configuration Editor' window. At the top, the 'Chapter Summary Expression' is '8 & 10 & 7 & 9 & 1 & 2 & 11 & 12 & 13 & 6 & 5 & 4 & 3'. The 'Chapter' is set to '1' and the 'Title' is 'Title'. The 'Expression' is 'Chapter Logical Evaluation Expression'. Below these are 'Save Chapter' and 'Delete Chapter' buttons.

The 'Rule' section shows 'Rule' set to '10.2.2' and 'Title' set to 'Content Type Header'. The rule description is: 'The response to the GET request on the URL defined in 10.2 or to the URL that actually returns the XML document after possible redirection(s) shall include the "Content-Type" header with "text/xml" as the value.' Navigation buttons 'Move Up', 'Move Down', and 'Delete' are on the left. A 'Next' button is at the bottom left of the rule area.

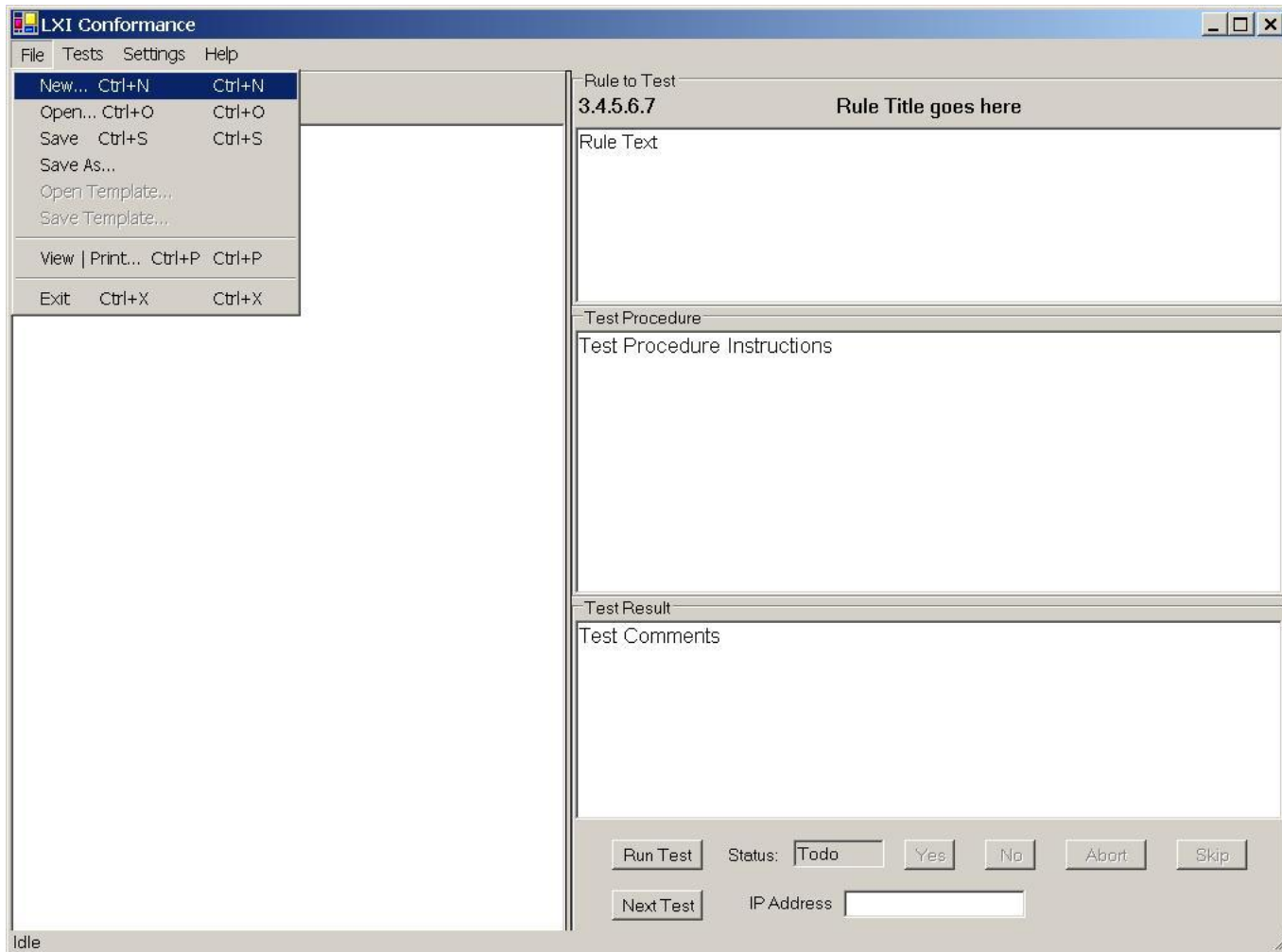
The 'Previous' button is at the bottom left of the test procedure area. The test procedure text is: 'This is an automated test (IdentHeader.pl)' and 'Returns Pass if content header is "text/xml"'. The 'LXI Class' dropdown is set to 'C'.

The 'Test Procedure' section has checkboxes for 'Wait For Operator Setup', 'HalfRack', and 'TestLab'. The 'Timeout (ms)' is set to '0'. The 'Save Rule' button is next to the rule name 'IdentHeader.pl'. The 'Arguments' field contains '/lxi/identification'.

LXI Conformance Test Suite—Start Up



LXI Conformance Test Suite—File->New



LXI Conformance Test Suite—Device Entry

Device Entry Form

Specification Revision: Test Date:

LXI Class: Test Location:

Physical Category: Tested By:

Vendor:

Vendor Website:

Firmware Version: Compliance Method:

MI Class:

MI Version:

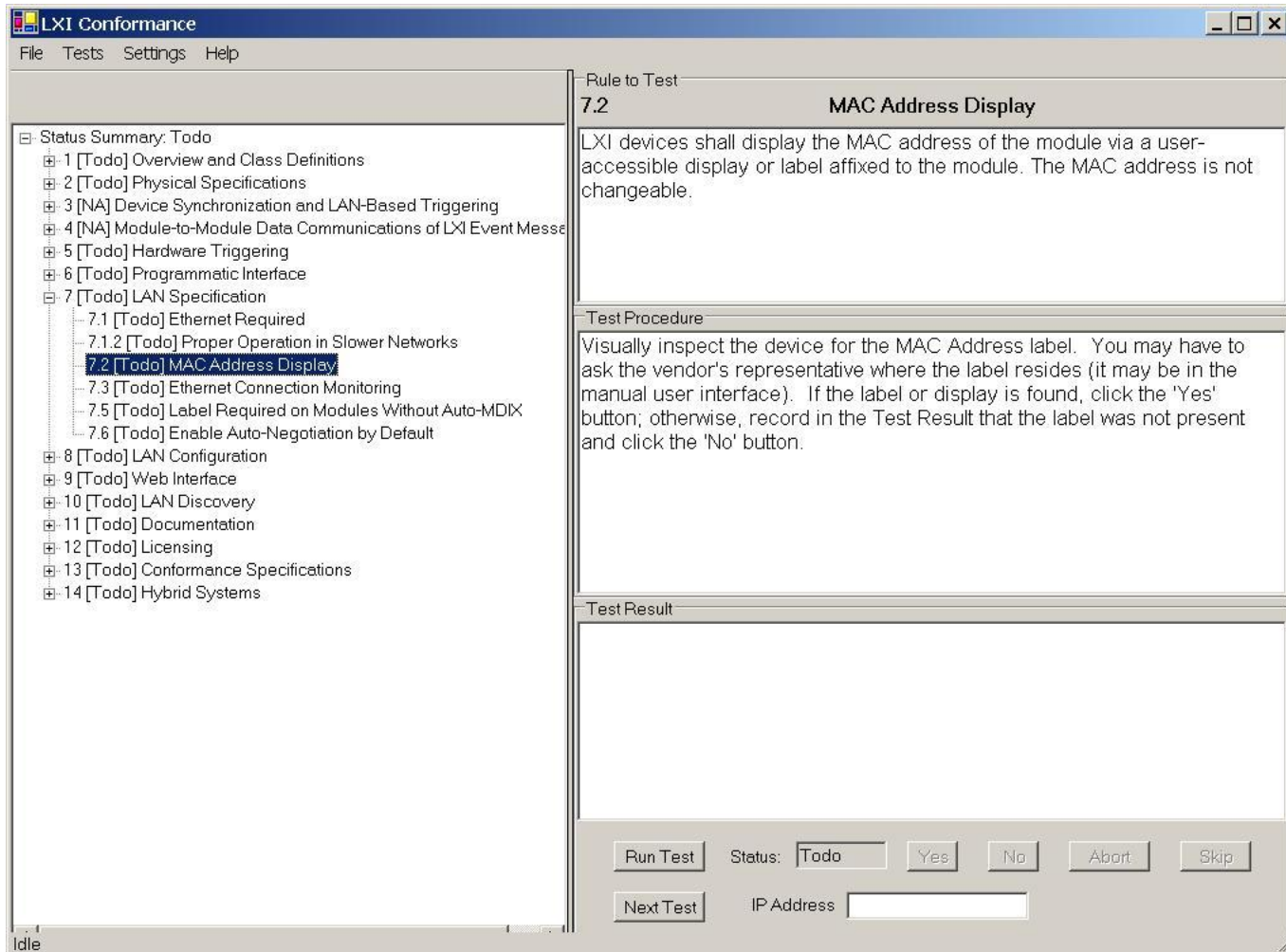
MI Identification:

MI Vendor:

Model	Description

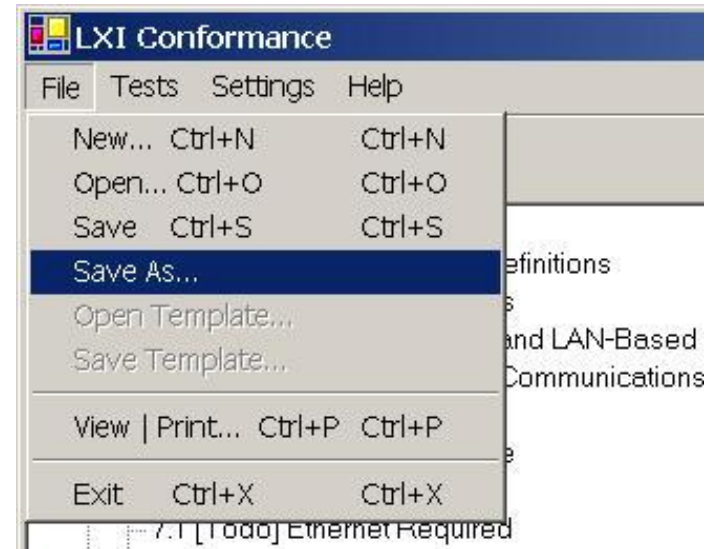
Buttons: Save, Cancel, Add, Delete

LXI Conformance Test Suite—Ready to Test



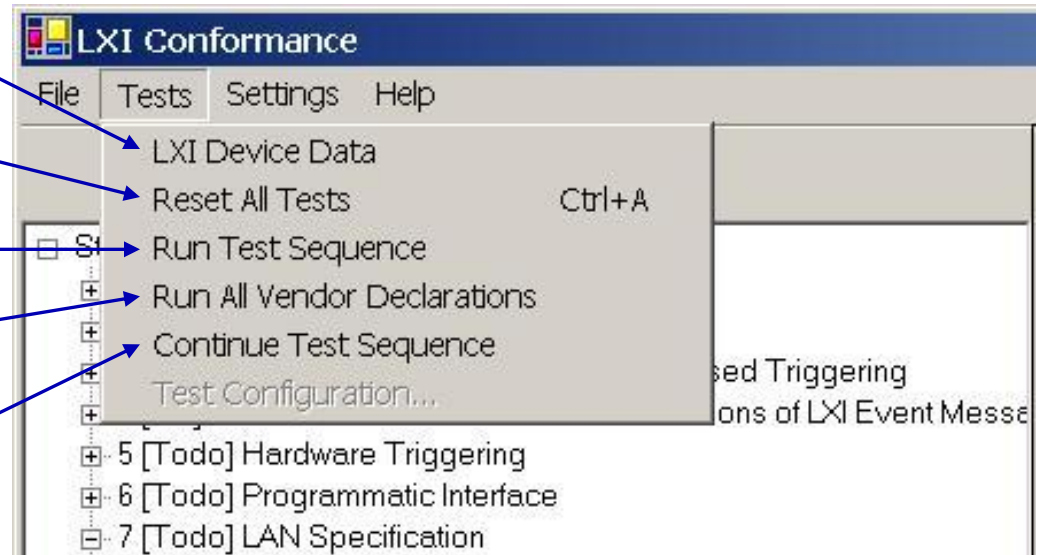
Recommended Start Procedure.

- **Open ConformanceTest.exe**
- **Click: File->New**
- **Fill out the Device Entry form and click 'Save'.**
- **Click: File->SaveAs to save the initial device data in the directory of your choice. This is particularly important for IEEE1588 tests because the Wireshark captures for these tests will then be saved in the same directory as the device data and device test results.**

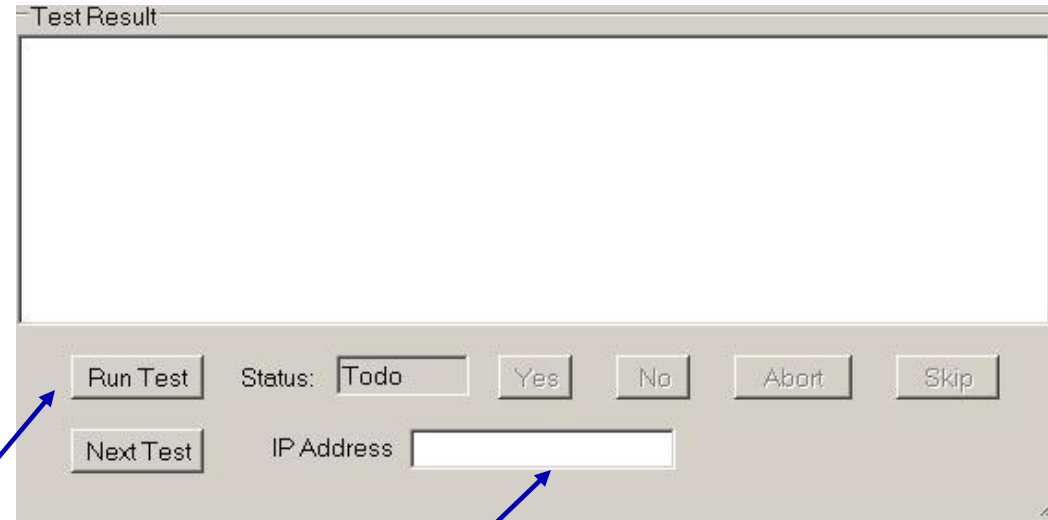


LXI Conformance Test Suite—Tests Menu

- Opens the Device Entry screen.
- Resets all of the test results to 'Todo.'
- Runs the entire test sequence.
- Runs all of the Vendor Declarations
- Continues the test sequence from the currently selected rule. This is useful for continuing a test session that has been interrupted.
Note: the test sequencer will not overwrite existing test results—to rerun a test use the **Run Test** button, then continue the sequence.
- Suggestion: Run the Vendor Declarations first, then run the Test Sequence.



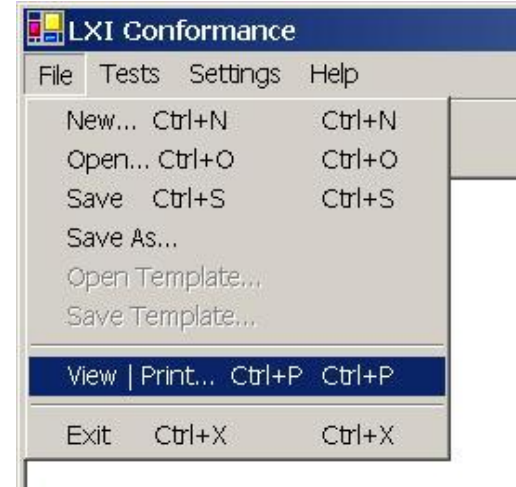
Resuming Tests



- Click: **File->Open** to select the XML results file saved earlier. It never hurts to save often.
- Either: **Run Test** 10.1 or type the IP address of the device into the **IP Address** field. This is necessary for any automated test to run correctly
- Select the desired test to run (or continue from) and proceed.

Viewing & Printing Results

- View | Print formats the XML results using an .XSL file and displays it in your default web browser.
- This can then be printed or transformed into a .PDF file and saved.



Todo	3.2.1	Implementation of IEEE 1588 Precision Time Protocol	
Pass	3.2.1.1	DUT responds correctly to Management Messages	<p>Subtest 1.C normal use of actionField GET or GET/SET:</p> <hr/> <p>Please check following values of clockDescription message for physicalAddress: 00-C0-3A-50-05-1A protocolAddress: NetworkProtocol --> UDP_IPv4 AddrLength --> 4 AddrField --> C0-A8-01-71</p> <p>manufacturerIdentity: 00-90-B8 productDescription: LXI Default PTP Product Description revisionData: LXI Default PTP Revision Data</p> <p>Subtest 1.G normal use of actionField = CMD:</p> <hr/>
Pass	3.2.1.2	Best Master Clock Test	

In Conclusion:

- **If all else fails—read the help file!**
- **You just might want to start there, too...**