



Device Conformance Testing

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Device Conformance Testing

Today's Topics:

- Conformance Testing process
- Changes and additions to Conformance Testing
- Ethernet-APL Conformance Testing
- What to consider for your Next Conformance Test
- Questions





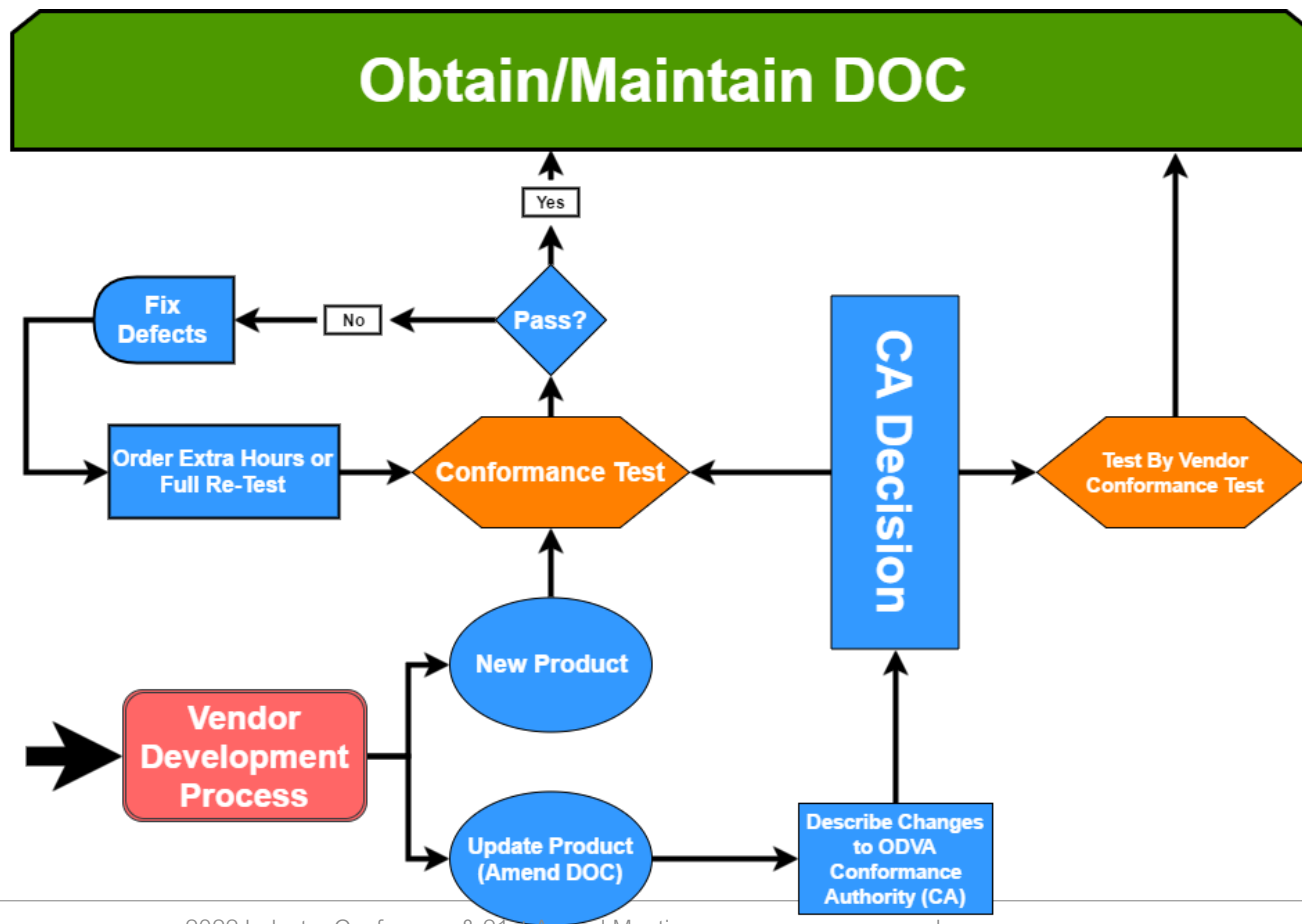
Conformance Testing Process

Conformance Testing Process

Conformance Testing Purpose

- Because You Have To (TOU)
- Better Products at Release
- Benefits Your Customers and Ultimately You







Changes and additions to Conformance Testing

New Tests and improvements in EtherNet/IP™ CT18/18.1



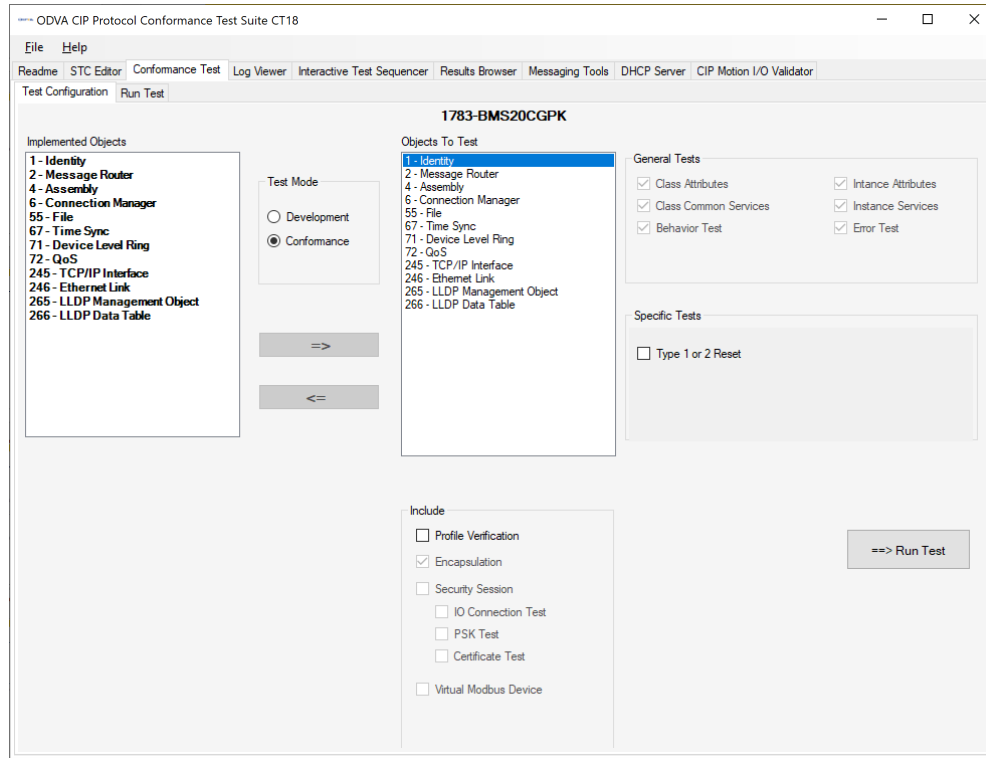
- CT18 has been integrated into ODVA Conformance Test Suite platform.
List of new features:
 - New STC Editor saving stc files in JSON format with .soc extension
 - Allow different instances of a CIP object to have different sets of configurations
 - Unified Conformance Test GUI for standard CT and CIP Security CT
 - New Log Viewer
 - CIP Routing GUI for Modbus routing configuration
 - Messaging Tool for UCMM/Explicit Messaging/IO/Encapsulation Commands and Object Scan
 - Versatile DHCP server
 - CIP Motion I/O Validator for CIP motion I/O format validation

New Tests and improvements in EtherNet/IP™ CT18/18.1



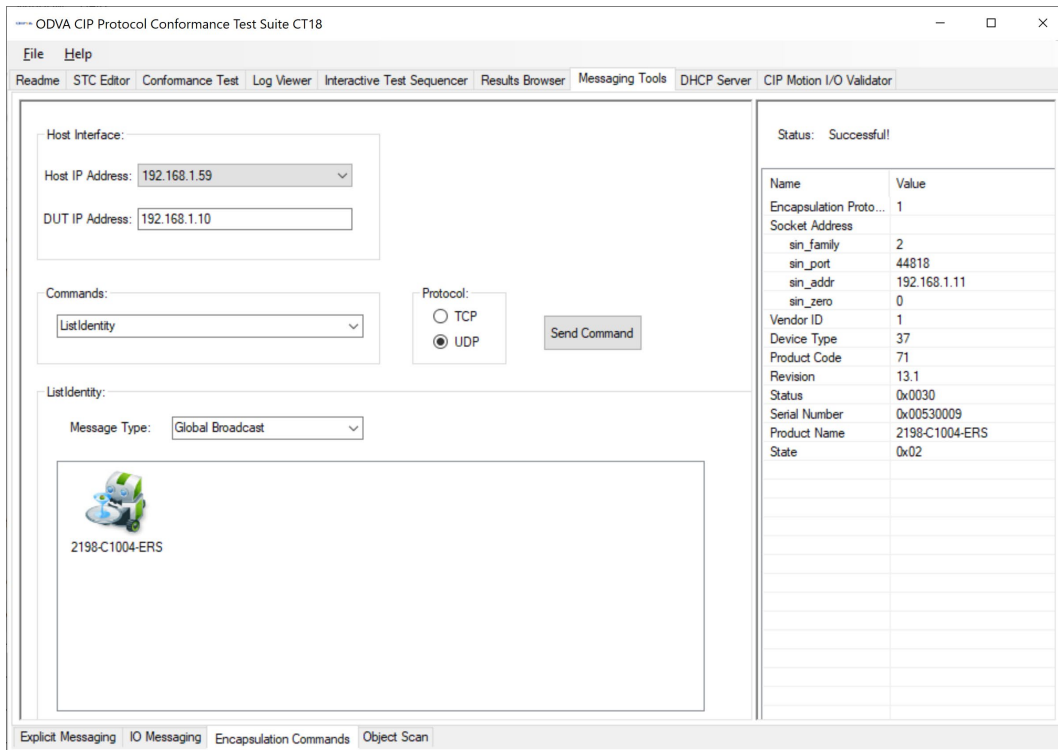
- Added tests for following CIP objects:
 - LLDP Management Object & LLDP Data Table Object
 - Process Device Diagnostics Object
 - IO Aggregation Object
 - Event Log Object
 - Register Object
- Support devices implementing UDP-Only Application Profile
- Verify correct response to Format 4 and 5 Electronic Keys for UCMM, connected Explicit and Implicit messaging.
- Running in silent mode

CT18 Framework – Highlights



- Revamped GUI

CT18 Framework – Highlights



ODVA CIP Protocol Conformance Test Suite CT18

File Help

Readme STC Editor Conformance Test Log Viewer Interactive Test Sequencer Results Browser Messaging Tools DHCP Server CIP Motion I/O Validator

Host Interface:

Host IP Address: 192.168.1.59

DUT IP Address: 192.168.1.10

Commands:

ListIdentity

Protocol:

☐ TCP

☒ UDP

Send Command

ListIdentity:

Message Type: Global Broadcast

2198-C1004-ERS

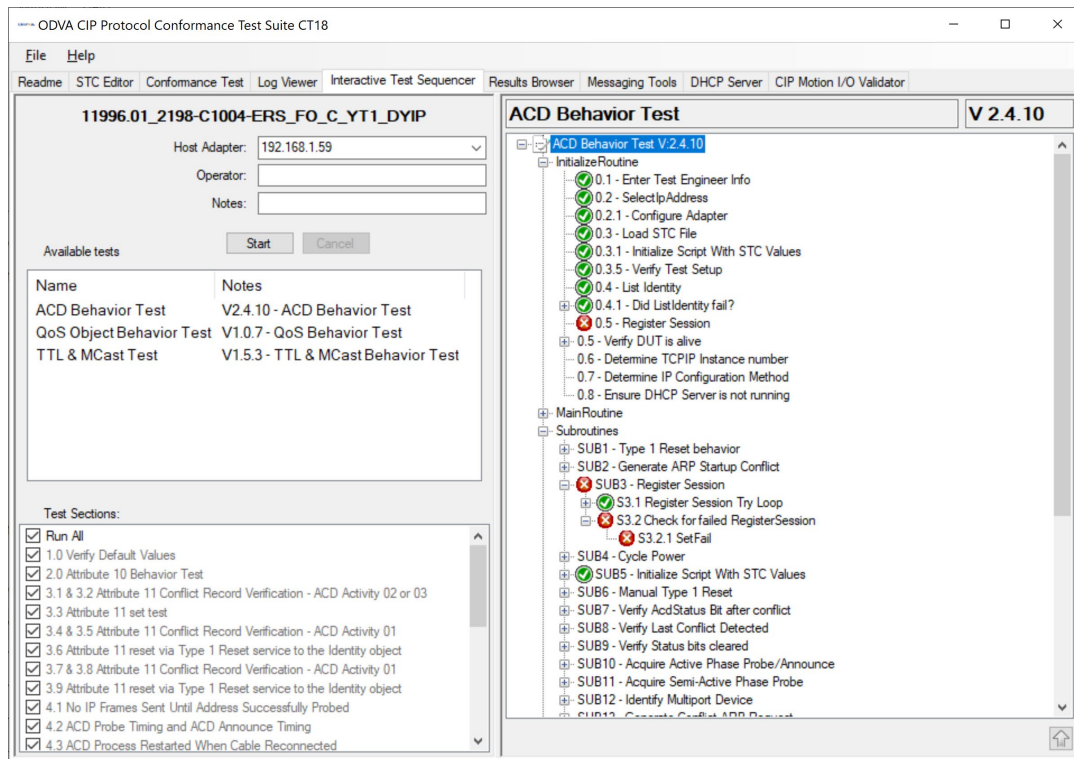
Status: Successful!

Name	Value
Encapsulation Proto...	1
Socket Address	
sin_family	2
sin_port	44818
sin_addr	192.168.1.11
sin_zero	0
Vendor ID	1
Device Type	37
Product Code	71
Revision	13.1
Status	0x0030
Serial Number	0x00530009
Product Name	2198-C1004-ERS
State	0x02

Explicit Messaging IO Messaging Encapsulation Commands Object Scan

- Encapsulation commands
 - List identity
 - List Interfaces
 - List Services
- Explicit messaging
 - Connected
 - UCMM
- I/O Connections
 - Multiple connections
- Object Scan

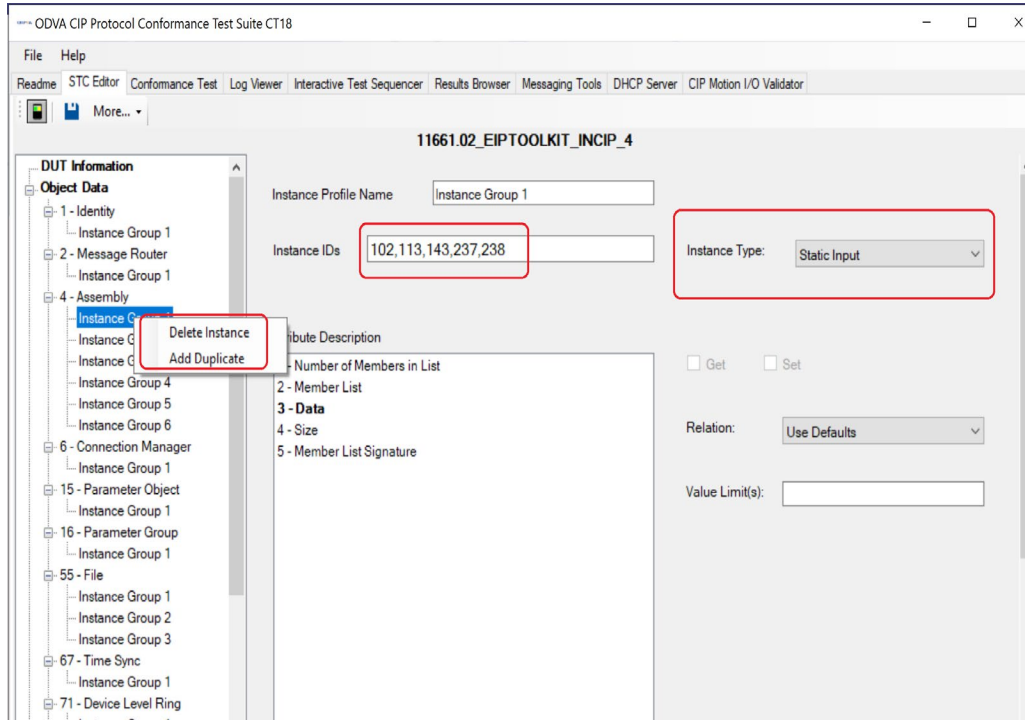
CT18 Framework – Highlights



Automated Scripts built in

- Selection of Scripts
- Visual feedback during test execution
- Automatic archiving of result data

CT18 Framework – Highlights



Add multiple instances of CIP Object

Planned Content – CT19

- Following CIP Specification published in November 2021
- The below object tests are updated or added based on the latest specification:
 - Identity Object, Time Sync Object, Register Object, Process Diagnostic Object, Motion Device Axis Object, Pilot Light Supervisor Object
- Improve AOP/DOP Object tests, add a new GUI which allows users to select I/O connection and configure object data in I/O message for Run/Idle test.

Planned Content – CT19

- Add Send_Receive_Fragment service test for Message Router Object which will be required for security device.
- Improve LLDP transmission and reception test
- Support Operator Interface Component Profile
- Support In-Cabinet device test

CT 19 release planned for July 2022

*LLDP implementation enforced on all test orders placed after April 2022



Ethernet-APL (Advanced Physical Layer)

Ethernet-APL (Advanced Physical Layer)

- **Problem**: Ethernet is very common in communications but does not meet the requirements for the process automation field, specifically process plants with hazardous areas.
- **Goal**: to be able to use Ethernet in hazardous areas (explosion potential)
- **Ethernet-APL**:
Ethernet with an Advanced Physical Layer (Ethernet-APL) will enable long cable lengths and explosion protection via intrinsic safety with communication and power over two wires.

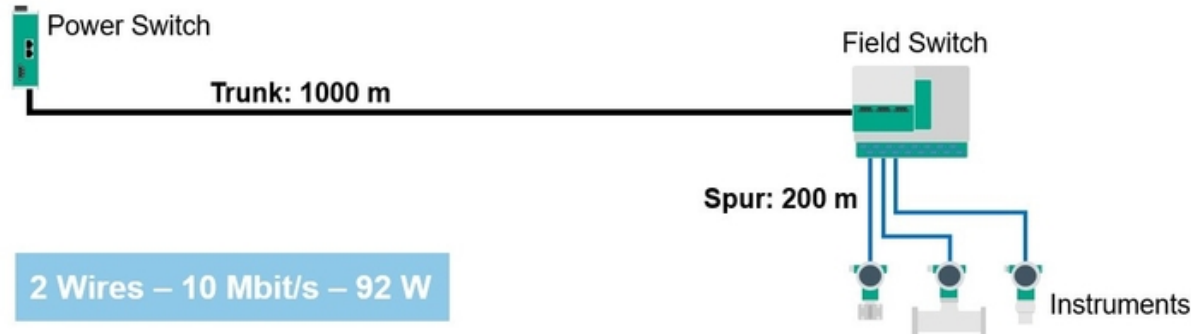
Ethernet-APL Specifications

- Derived from IEEE 802.3cg (SPE), Ethernet-APL references and standardizes industrial automation extensions.
- Ethernet-APL defines port profiles for multiple power levels with and without explosion hazardous area protection
 - Markings on devices and instrumentation indicate power level and function as sourcing or sinking.
 - This provides a simple framework for interoperability from engineering to operation and maintenance.



Ethernet-APL Specifications

- Ethernet-APL uses Trunk and Spur topology
 - The “Trunk” provides high power and signal levels for long cable lengths of up to 1000m
 - The “Spur” carries lower power with optional intrinsic safety for lengths of up to 200m



Ethernet-APL Conformance Test

- Ethernet-APL Conformance Test
 - Data Tests (17 test sections) analyze data and signal integrity under various testing conditions
 - Power Tests (18 test sections) analyze electrical characteristics specific to the DUT (source vs load, spur vs trunk, etc.)
- ODVA will support Ethernet-APL conformance testing with eventual planned integration into CT19



Your Next Conformance Test

Getting ready for your next Conformance Test

- Use CT tool during your development process
- Start early – submit your conformance test order well in advance*
- Read the ODVA Test Guidelines in the Conformance Test Details Form
- Review and run the manual tests in all configurations (DHCP, Static, etc) the DUT supports
- Ask Questions! – conformance@odva.org



*Test must be conducted within 6 months of the test order



Questions?