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
Obtain/Maintain DOC

1. Vendor Development Process
   - Fix Defects
   - Order Extra Hours or Full Re-Test
   - Conformance Test

2. CA Decision
   - Pass?
     - Yes: Go back to Conformance Test
     - No: Order Extra Hours or Full Re-Test
   - New Product
   - Update Product (Amend DOC)
   - Describe Changes to ODVA Conformance Authority (CA)

3. Test By Vendor Conformance Test
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

- 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-AVL (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-AVL**: Ethernet with an Advanced Physical Layer (Ethernet-AVL) 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

2 Wires – 10 Mbit/s – 92 W
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?