Whitepaper

Certification Testing Configuration Guidelines

OPC Server Configuration

Compliance

March 12, 2014

Contents

1 Introduction

This document provides the necessary instructions for you to prepare your OPC Server (DA, UA) configuration for certification testing. Submit your configuration to the lab along with installation instructions.

1.1 Terminology

The terms *Node* and *Tag* mean the same thing, i.e. an item in the address-space of the Server.

2 Server Configuration Requirements

- A real-world configuration is desired for testing.
- Data acquisition from real data-sources is required; see 2.1 Data Acquisition from Devices below.
- Address-space size and data-types are described in 2.2 PLC/Device Equipment Configuration on page 4.
- The server must be configured to allow multiple OPC Clients to connect concurrently.
- A valid license (if applicable) enabling all OPC functionality must be sent to the lab.
- Full tracing of OPC activity enabled.

Cannot provide the configuration? Please send Server configuration instructions per these requirements.

2.1 Data Acquisition from Devices

If the OPC Server supports data acquisition from devices (PLCs etc.) then:

- A minimum of 2 devices must be configured, although 3 are preferred.
- Each device should be configured with the manufacturer recommended settings (timeout etc.)
- The configuration of these devices should be defined for maximum reliability and data throughput.

If the OPC Server only provides access to in-memory data then it is exempt from the above requirements.

2.1.1 Modbus Support

The OPC-Foundation lab provides 3 Modbus devices that can be accessed via Serial (COM1) or TCP/IP Ethernet (192.168.2.248, 192.168.2.249, and 192.168.2.250).

We recommend the following Modbus Simulator: www.hmisys.com

Prefer to use an alternate device/protocol? Contact the lab immediately to coordinate arrangements.

2.2 PLC/Device Equipment Configuration

- The device should be configured with as many Tags/Nodes as reasonably possible, i.e. 1000+.
- It is not necessary to configure more Nodes than the server can handle.
- The IP address of the device (if applicable) should be configurable with tools provided with the device.
- Any additional hardware/software and/or communications-drivers must be shipped to the lab.

2.3 Address Space Configuration

The Server should be configured with:

- Static items - items that won't be changed by the device.
- Dynamic items – items whose values change automatically by the device.

Note: Configured items should not overlap in the physical registers of the device i.e. do not configure 2 bytes and 1 word and 16 Booleans to use the same physical addresses.

- All supported data types which includes:
  - Scalar: 100 of each type; constrained servers may use fewer, e.g.5.
  - Array: 1 of each type; min. array size of 10-elements (constrained servers use 5-elements).
  - Other: 5 of each supported other data-types.
- Items with configured ranges for deadband testing must be provided, if supported.
- Items with different access-rights must be available, e.g. Read/Write, Read-only, Write-only.

Please refer to *Appendix B - Example OPC Server Address Space* on page 6.

Please export the items to a CSV file as described in *Example CSV File* on page 7.

3 Appendix A – OPC Server Check List

Use the following checklist to prepare the information needed by the Lab. Do not send this list to the lab.

#	Item	y/n	Initials	YY-MM-DD
PLC Device(s) *(see 2.1 **Data** Acquisition from Devices on page 3)*				
1.	2 devices prepared and ready for shipping with return instructions?	☐		
2.	Power cables provided for each PLC/device?	☐		
3.	Communications cables (RS232, RJ45 etc.) provided for each PLC/device?	☐		
4.	Devices programmed for testing?	☐		
5.	Applicable device driver(s) and configuration software provided?	☐		
OPC Server				
6.	Release version software provided to the Certification Test Lab? *installer and instructions etc.*	☐		
7.	Necessary supplies provided if it is a hardware product? *Power cables, connectors etc.*	☐		
8.	License (activation code) provided?	☐		
9.	Server's Address Space prepared with Static, Dynamic and R/RW/W items?	☐		
10.	Server's Address Space exported to CSV? *See Error! Reference source not found. **Error! Bookmark not defined.**.*	☐		
11.	Server's Configuration file provided?	☐		
Other Resources				
12.	Technical support contact(s) provided?	☐		

4 Appendix B - Example OPC Server Address Space

Please refer to the Standardized Address Space Guidelines document available here:
http://www.opcfoundation.org/developer-tools/certification-test-tools/configuration-guidelines/

5 Appendix C – Node Address Space Text File

A CSV file format has been defined for use with the CTT when load testing your OPC Server. This file will be used as input for automatically generating configuration files for different test tools.

5.1 DA Server

The first line of the CSV file contains the machine name (or IP address) and the server ProgID, with the remaining lines containing the itemID, AccessRights, DataType, UseIdentifier, and Device.

ItemID: The fully qualified name of the item in the servers address space

AccessRights:R, W, RW (readable, writeable, read- and writeable).

DataType: The numeric DataType value of the VariantType of the item
See Appendix D – COM Variant Data Type Definition on page 8.

5.1.1 Example CSV File

```
localhost;OPCSample.OpcDaServer

DeviceA/Configuration/ChangeRateDynamic;RW;18;Configuration;DeviceA

DeviceA/Configuration/ChangeRateDynamicFast;RW;18;Configuration;DeviceA

DeviceA/Configuration/ChangeRateDynamicSlow;RW;18;Configuration;DeviceA

DeviceA/Deadband/Decimal_RW;RW;14;Deadband;DeviceA
```

6 Appendix D – COM Variant Data Type Definition

Variant Type	Num	Variant Type	Num	Variant Type	Num
VT_EMPTY	0	**VT_NULL**	1	**VT_I2**	2
VT_I4	3	**VT_R4**	4	**VT_R8**	5
VT_CY	6	**VT_DATE**	7	**VT_BSTR**	8
VT_DISPATCH	9	**VT_ERROR**	10	**VT_BOOL**	11
VT_VARIANT	12	**VT_UNKNOWN**	13	**VT_DECIMAL**	14
VT_I1	16	**VT_UI1**	17	**VT_UI2**	18
VT_UI4	19	**VT_I8**	20	**VT_UI8**	21
VT_INT	22	**VT_UINT**	23	**VT_VOID**	24
VT_HRESULT	25	**VT_PTR**	26	**VT_SAFEARRAY**	27
VT_CARRAY	28	**VT_USERDEFINED**	29	**VT_LPSTR**	30
VT_LPWSTR	31	**VT_FILETIME**	64	**VT_BLOB**	65
VT_STREAM	66	**VT_STORAGE**	67	**VT_STREAMED_OBJECT**	68
VT_STORED_OBJECT	69	**VT_BLOB_OBJECT**	70	**VT_CF**	71
VT_CLSID	72	**VT_VECTOR**	0x1000	**VT_ARRAY**	0x2000
VT_BYREF	0x4000	**VT_RESERVED**	0x8000	**VT_ILLEGAL**	0xffff
VT_ILLEGALMASKED	0xfff	**VT_TYPEMASK**	0xfff		

The information above was obtained from: http://home.clara.net/marin/COM/variant_type_definitions.htm

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Revision History

Version	Date	Author	Change
1	2007	CMP	Initial version.
2	Mar-12, 2014	CMP	Reformatted to use new template.