Integration Concepts

Tuesday, February 07, 2012
8:36 AM

Integration: What is it

In engineering, **system integration** is the bringing together of the component subsystems into one system and ensuring that the subsystems function together as a system.[1] In information technology, **systems integration**[2] is the process of linking together different computing systems and software applications physically or functionally,[3] to act as a coordinated whole.

Pasted from <http://en.wikipedia.org/wiki/System_integration>

Integration: How does it work

Integration software/systems takes data from sources as well as sends data to sources for the purpose of providing remote management of these "nodes". For instance, in a normal SCADA system there are child PLCs that perform some operation like monitoring the temperatures, voltage, current, power, or other attribute on some device or area. The mother PLC then poles each child PLC to retrieve the data so that it can be displayed on some HMI, sent to a data store(Database), and/or used as feedback to correct another system. Integration comes in when this one SCADA system is replicated several times and it becomes important that each of these SCADA systems can be monitored and adjusted remotely in order to reduce the number of people who would have to sit and manually monitor each SCADA system. The integration engineer would come in and pull off the critical attributes from each SCADA system and link them to one central HMI, set up alarms that would attract the attention of the now lone monitoring employee and provide connectivity to the SCADA system that would allow the tech to adjust the operation of the SCADA system if this were possible and safe to do so. (some people have integrated there homes. This gives them the ability to see who is home from the office, turn on the oven to start dinner as they navigate traffic on the way home, start the coffee brewing from there cell phone, set up times to turn lights on and off while they are away on vacation, make sure the vacuum bot has ran before the guests and they get home, etc.)

Integration: Why would someone want to integrate

Integration makes the HMI available such that a manager could remote into the network from home, monitor the system and make needed adjustments all without having to come to the location. This gives the benefit of having one manager able to control several different sites anywhere in the world without him/her ever needing to go to the physical location of what they are controlling. This also makes the system much more visible to other interested parties. For instance, a manager trying to decide if they needed to upgrade a Power Distribution Unit might casually keep an eye on how often the PDU was overloaded or even go back and look at historical data from an integrated system to determine if the PDU needed to be upgraded or if they needed to increase capacity by adding another PDU. This would not be possible without a lot of effort on the part of the manager and employees if the system had not been integrated. In making this determination the manager can also make better decisions about power management, Air -conditioning, Server loading, etc. Al of this results in cost savings for the company.

Software Development

Tuesday, August 07, 2012
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Wonderware Development should follow the Waterfall model:

- Requirements
    - Design
        - Implementations
            - Verification
                - Maintenance

Requirements stage:

- Equipment list
- Network architecture/connection points
- Points list/device
- Network probing to validate network design and paoints
- IP Addresses
- Customer expectations/samples of existing software
- Test plan for system

Design

- Design Template from requirments:
    - FAs/UDAs
    - Scripts (Status'/functionality)
    - Alarms
    - Graphics
    - Object structure
    - Update design documents
- Design Top-server import documents
    - Simulation CSV File
    - Runtime CSV File
    - Simulation OPC File
- Develop object/sub object(s)
    - FAs/UDAs
    - Scripts
    - Alarms
    - Graphics
    - Update design documents
- Design Test plan for object(s)
    - FAs/UDAs
    - Scripts
    - Alarms
    - Graphics
    - Customer requirements
- Perform preliminary testing on objects
    - FAs/UDAs
    - Graphical Displays
    - Alarms

Implementation

- If using alarming turn alarming off or input filter for area/devices.

- Deploy View App to appropriate platforms
- Import CSV files into top-server (Configure top server)
- Ping Device IPs
- Use OPC client to validate data is coming in on tags
- Deploy & Configure Engine Instances
- Deploy & Configure Area Instances
- Deploy & Configure IO Instances
- Deploy & Configure RDI Instances
- Validate Data is coming in on IO/RDI instances using object viewer
- Deploy & Configure Device instances
- Validate Data is showing up in HMI and trending is working correctly
- If using alarming/paging, Once all work is completed, turn alarming/paging back on or remove filter for area/devices.

Verification

- If third-party commissioning activities are to take place wait for weekly Punchlist or talk to commissioning agent about performance of objects to find issues. If not then setup personal inspection of equipment to measure values and compare to HMI.
- Compare raw input to HMI values by:
    - Capture/Measure device input values and write them down in a comparison document.
    - Capture HMI values for device and record values in comparison document

      OR

    - Capture HMI Values for device and record Raw Input values on Printed Screenshot/Capture of device.
    - Scan document to obtain digital copy for email and storage.
- Check any values that are significantly different to find reason for variance in point value.

Maintenance

- Troubleshoot comm. issues
- Validate block size and timing settings in top-server

Object Creation

Thursday, February 09, 2012
10:51 AM

General Object Creation Process:

1. Determine Device and required attributes (FA & UDAs)
2. Create Parameters spreadsheet for object
3. Top Server-Sim Channel
    a. Create first few "Tags" in Top server under the Sim channel and then export them as a CSV file to get format of the file correct when modifying with the new tag list info.
    b. Open CSV file using Excel, copy the list of "Tags" from the Parameters spread sheet into the column "Tag Name" in the CSV file and copy the default values from the first tags exported in the file down for each of the new tags listed.
    c. Save the new CSV file in a location you can get to from the Top Server.
    d. Import the new tags list into the channel.
4. In Top Server create a new channel by right clicking anywhere on white space in the Devices area. This will be your Top Server Communications Channel. Go through the wizard selecting the correct driver, Network Adapter, Writes, Sockets, etc. Then review your selections and click finish to create the channel.
5. Top Server-Communications Channel
    a. Create first few "Tags" in Top server and then export them as a CSV file to get the format of file correct when modifying with the new tag list info.
    b. Open CSV file using Excel, copy the list of "Tags" from the Parameters spread sheet into the CSV file and copy the default values from the first tags exported in the file for each of the new tags listed.
    c. Save the new CSV file in a location you can get to from the Top Server.
    d. Import the new tags list into the channel.
    e. Go through each tag and ensure that the values for address, Data type, and Description are correct.
6. Open the ArchestrA IDE connecting to the QTC Gallaxy.
7. Under the QTS Galaxy in the Template Tool box expand the node until you see the "Affinity Toolset". Expand this Toolset so that you can see the different folders. You should notice that the folders are named by either a company name or an object type (I.e. you should see a folder named "GE" and then just below it you should see a folder named "IO_Objects"
8. In the folder "System" you will see other objects that have already been created as derived objects. Select one that is a close match to the object you wish to create and then right click the object and select New/Derived Template from the menu. It will show up under the same name as the object you selected but with a "_001" appended to the name (I.e. $UserDefined_IO_Master_Affinity_001).
9. Rename this object with the model number of the device you are creating the object for (I.e. $CM4000) and then drag it to the folder of the manufacturer of the device (I.e. SquareD). Later you will do the same thing but for an "Area" object and then you will create an instance object from your template object.
10. Use your Parameters spreadsheet to input your Field attributes into your template object. Make sure that you put "---" in the "Input Source" box.
11. When you are done click the "Save and close" icon to save the changes to the object and check it in so that you can create your instance from the new template.
12. At this point you will now follow step 8 to create your new area instance except you will now select "Instance" instead of "Derived Template" from the menu. This will create a new instance under the "Unassigned Host" in the "Deployment View". Rename this area object to match the area the device will be in and drag it down to the appropriate application engine (where it will run under).

13. Now, create a new instance from your object template by right clicking on the template, selecting "New/Instance" from the menu and then drag the instance to the instance of the area you just created.
14. Open the instance and for each filed attribute set the "Input Source" to the Channel and Tag you created for it in Top Server. Once you have done this for every field attribute click the save and close icon to save, check in, and close your instance.
15. Create a new instance of the "KepServerDDESLClient_Aff",rename it to something meaningful, drag it down to the correct IO_AppEngine.
16. Open the new instance of the "KepServerDDESLClient_Aff" and go to the "Topic" tab and add a new topic using the name of your device instance name of the device object you created.
17. Right click on the instance of your object and select "View in Object Viewer" from the menu. Now pull the attributes you want to monitor down from the list on the top right down to the "Watch List1" window. You should see it say "Initializing" under the quality column and then go to a "C0:Good" if you have everything configured correctly.

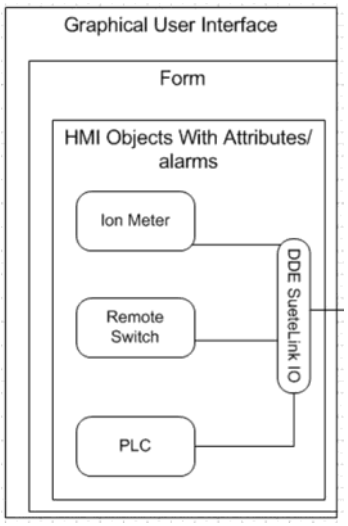
Wonder Ware

Thursday, February 09, 2012
1:53 PM

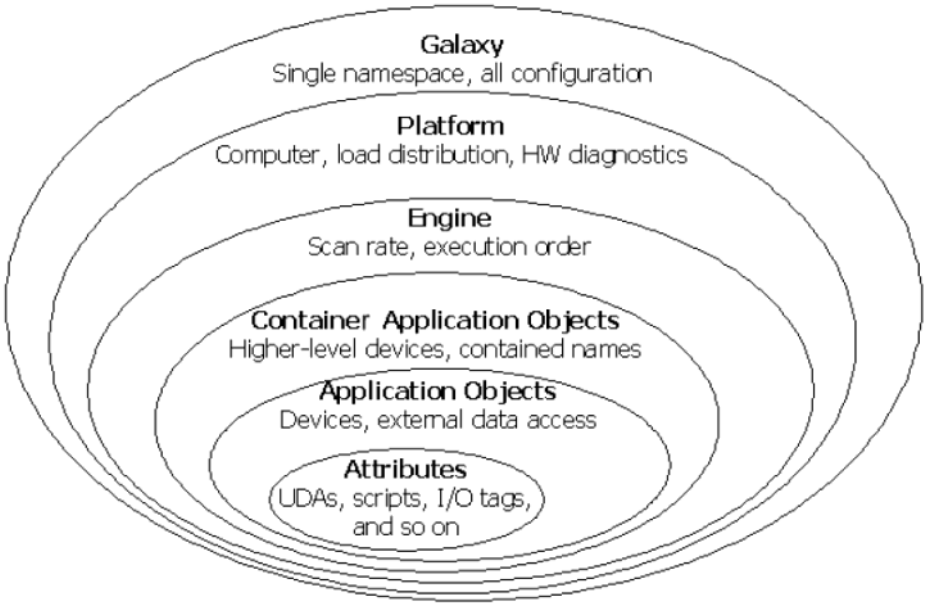
When deploying a view app to a platform the location of all the files for this view app are usually stored at:
"C:\\Program Files[(86)]\AchestraA\Framework\Bin\[Viewapp Name]"
***Note: All folders and the main folder should be filled with several files for a large project.**

Hierarchy

Thursday, February 09, 2012
3:43 PM



Resides on a platform(s)



Scripting/Code

Monday, March 19, 2012
10:53 AM

Script Types:
• Application scripts execute either continuously while WindowViewer is running or one time when WindowViewer is started or shut down.
• Window scripts execute periodically when an InTouch window is open or one time when an InTouch window is opened or closed.
• Key scripts execute one time or periodically when a certain key or key combination is pressed or released.
• Condition scripts execute one time or periodically when a certain condition is fulfilled or not fulfilled.
• Data change scripts execute one time when the value of a certain tag or expression changes.
• Action scripts execute one time or periodically when an operator clicks on an InTouch HMI graphic object.
• ActiveX event scripts execute one time when an ActiveX event occurs, such clicking the ActiveX control.

MEM OLE(only appears if the Manufacturing Engineering Module (MEM) is installed)
OLE objects and ActiveX controls allow you to access your native computer system functions and interact with other programs such as the Manufacturing Engineering Module.

Contacts

Wednesday, June 13, 2012
10:19 AM

InSource Technical Support
Phone: (704) 895-1052
Account#: 29824
Under tech support options select other to get engineer.

Serial Communications

Tuesday, July 03, 2012
9:04 AM

AN-960 Ap...

RS485_Ch...

RS485_tro...

Building Integration Learning

Tuesday, February 07, 2012
8:29 AM

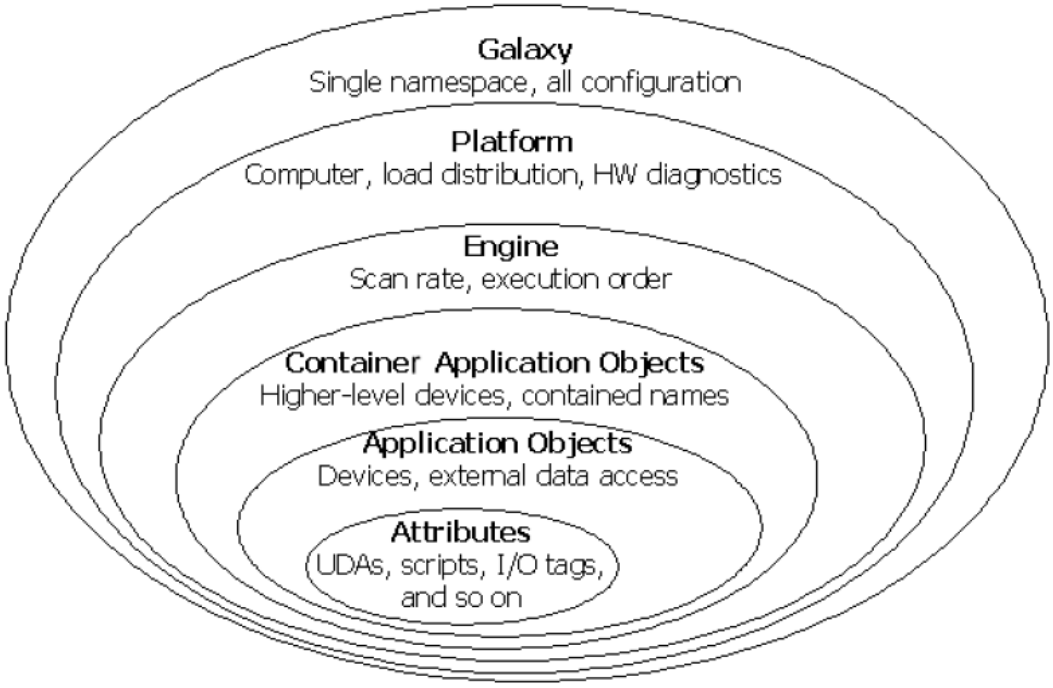
Building Automatio...

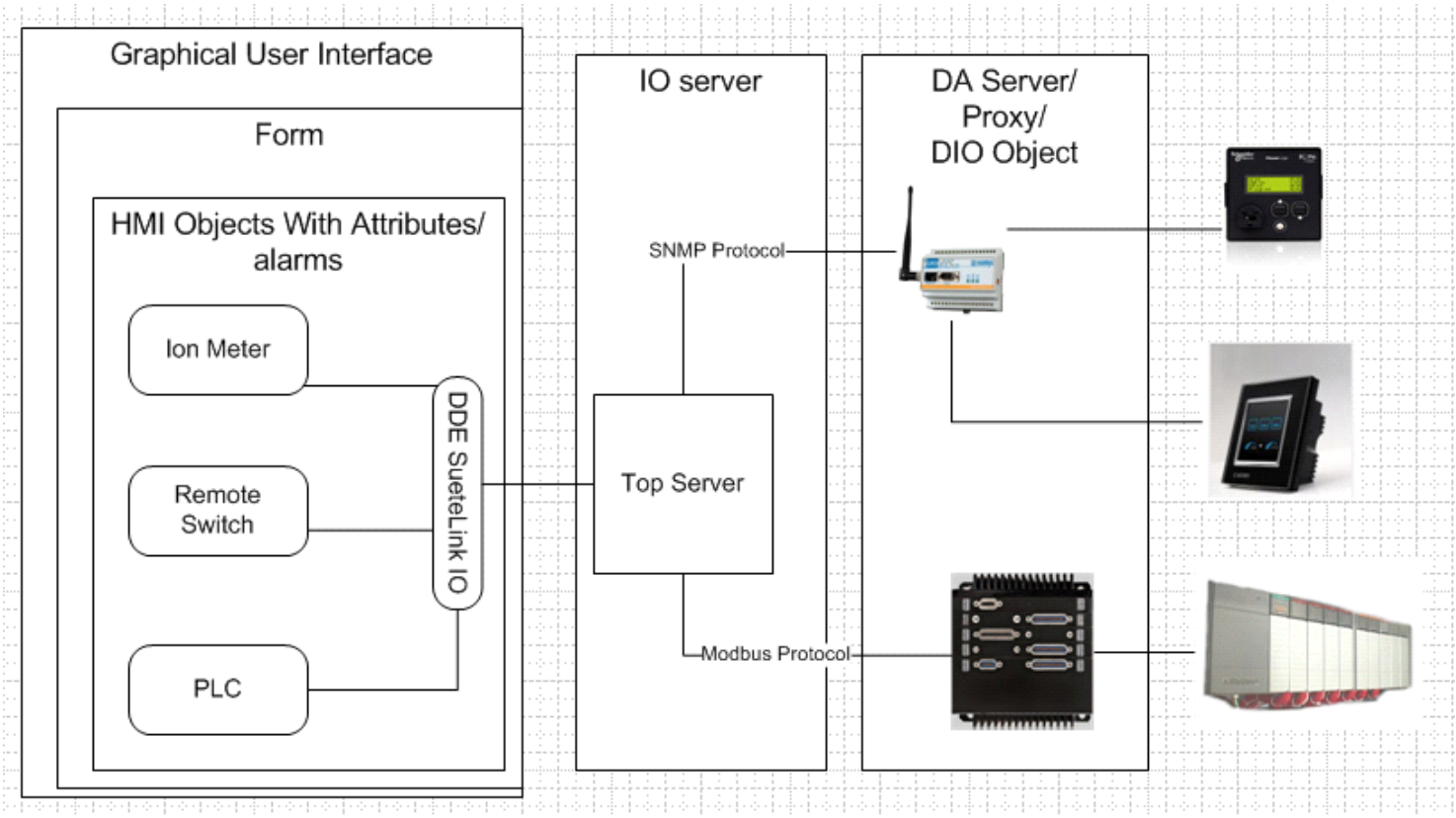
Affinity_Template_Cr...

The_Benefits_of_Com...

IDE31_SP2

ITScriptsAndLogic




Graphical User Interface
Form
HMI Objects With Attributes/ alarms
Ion Meter
Remote Switch
PLC
DDE SueteLink IO
IO server
Top Server
SNMP Protocol
Modbus Protocol
DA Server/ Proxy/ DIO Object

Integration of Data sources

Tuesday, February 07, 2012
8:20 AM

Integratio...

Audio overview of attributes and objects

Video Tutorials

Thursday, February 09, 2012
8:41 AM

WonderW...

Basic Overview

Passwords/Users

Friday, June 01, 2012
7:57 AM

Loginto: Fourier
User: Administrator
Pswd:dsfanc23

Or

User: Forier\scada_admin
Pswd:wonderware1!

Loginto: Affinity FTP Site
User: qtshydra
Pswd: qts$1hydra

File Transfer Protocol

Friday, June 08, 2012
7:44 AM

Address: Ftp://50.96.131.124
User: qtshydra
PSwd: qts$1hydra