Course Description

The Application Server 2014 R2 course is a 4-day, instructor-led class designed to provide a fundamental understanding of the features and functionality of Wonderware Application Server. This course provides lectures and hands-on labs to supply and reinforce the knowledge necessary to use the ArchestrA tools and services in the System Platform for plant modeling.

The class will demonstrate how to use Wonderware Application Server to utilize the ArchestrA technology to connect to field devices, process data, run scripts, handle alarms, and historize alarms and events. This is achieved using features and functionality such as Automation Objects, templates, instances, the ArchestrA Integrated Development Environment (IDE), and the QuickScript .NET scripting engine.

This course also provides a fundamental understanding of Galaxy maintenance, real-time alarm recording and security settings, and how to setup redundancy.

Objectives

Upon completion of this course, you will be able to:
- Create and deploy new applications using ArchestrA IDE
- Model the plant floor using automation objects
- Acquire data from field devices
- Work with alarm and history configuration in a Galaxy
- Define the security model for a Galaxy
- Configure application-level and device integration redundancy

Audience

- Application developers
- Engineers
- System integrators
- Other individuals who use Application Server in their manufacturing processes

Prerequisites

- Manufacturing industry experience

Course Outline

Module 1 – Introduction

Section 1 – Course Introduction

This section describes Wonderware Application Server 2014 and Device Integration Products, the objective of the course, intended audience, prerequisites, and the course agenda. It also includes a description of Wonderware Products.

Section 2 – System Platform Overview

This section explains the architecture, components, and services that comprise the System Platform and its Clients.

Section 3 – Application Server Overview

This section provides an introduction to the Application Server, as well as the concepts and terminology associated with it. A description of what a Galaxy is, how it relates to the Galaxy Database and Repository, and how a Galaxy is created are also covered.

Section 4 – The ArchestrA IDE

This section provides an introduction to the ArchestrA IDE, its toolboxes and toolsets, menus, toolbar items, and its Application Views.

Section 5 – Automation Objects

This section provides an explanation of the various types of objects in a Galaxy, what they represent, and how they are utilized. This section also explains the purpose of Checking Out and Checking In an object.

Section 6 – System Requirements and Licensing

This section provides a description of the System Platform topology and the Network Account Utility. This section also describes the system requirements necessary for Wonderware Application Server and the Licensing model. A discussion of virtualization support is also provided.

Module 2 – Application Planning

Section 1 – Application Planning

This section describes suggested project workflow, identifying field devices and functional requirements, defining naming conventions, planning templates, and area, security and deployment models.

Section 2 – Case Study

This section discusses the simulated manufacturing environment to be used throughout the training and explains the naming convention that is used in the simulated process.

Module 3 – Application Infrastructure

Section 1 – The Area Model

This section provides an explanation of the importance of having a plant model. Additionally, it explains the concept of Area Objects and how to utilize the Model View in the ArchestrA IDE.

Section 2 – The Deployment Model

This section provides a discussion of the hosting relationship between objects and the different object states in a Galaxy. An explanation of the use of the $WinPlatform and

$AppEngine objects and a discussion on the Deployment View in the ArchestrA IDE is also provided.

Section 3 – The Runtime Environment

This section provides an explanation of the Runtime environment and the use of the Object Viewer and Platform Manager to monitor it. Additionally, it explains attribute referencing and how to upload changes from the Runtime environment to the configuration database.

Section 4 – Device Integration Products

This section provides an introduction to Device Integration Servers. It also provides an explanation of Device Integration Objects, their communication protocols, and I/O addressing. A discussion of the use of Advanced Communication Management is also provided.

Module 4 – Application Objects

Section 1 – Introduction to Application Objects

This section introduces application objects.

Section 2 – Enhancing Objects With Attributes

This section explains the attributes page and the configuration options available for application objects.

Section 3 – Change Control and Propagation

This section presents the concept of attribute locking and unlocking and describes how template changes can propagate to previously derived objects.

Section 4 – Containment

This section illustrates the concept of containment and its relationship with Templates and application objects. A discussion of different modeling approaches is also provided.

Module 5 – Alarms and History

Section 1 – Alarms Overview

This section discusses how ArchestrA handles alarms and events and explains the Alarm Extensions. Additionally, it describes the alarm related attributes.

Section 2 – Historization

This section discusses how ArchestrA handles historization of data. Additionally, it describes the history-related attributes and the Store-and-Forward functionality.

Module 6 – Galaxy Maintenance

Section 1 – Objects Export and Import

This section provides an understanding of how to export and import objects from and to a Galaxy to reuse objects in different projects, upgrade objects to new versions, or revert back to previous configuration versions.

Section 2 – Galaxy Dump and Galaxy Load

This section provides an understanding of how to use the Galaxy Dump and Galaxy Load features of the ArchestrA IDE for bulk modification or creation of object instances.

Section 3 – System Management Console

This section provides an introduction to the SMC and explains how to utilize the Backup and Restore operations using the Galaxy Database manager, including how to create a new Galaxy from a backup file. A discussion of the ArchestrA Logger and Log viewer is also included.

Module 7 – Security

Section 1 – Security Overview

This section provides an understanding of how ArchestrA handles security, the security audit trail, authentication modes, and General and Operational permissions. An explanation of Security Classifications and how they relate to Operational permissions is also provided.

Module 8 – Redundancy

Section 1 – Application Redundancy

This section provides an understanding of the terminology, topology, and concepts of application redundancy and how it should be configured.

Section 2 – Device Integration Redundancy

This section provides an understanding of the terminology and concepts of device integration redundancy and how it should be configured.

Module 9 – Introduction to QuickScript.NET

Section 1 – Introduction to Scripting

This section provides an understanding of the scripting environment, the QuickScript .NET language, and explains the execution types and triggers.

Section 2 – Variables and Control Statements

This section explains variables usage and data types, and the different control statements.