PlanetTogether Advanced Planning & Scheduling

APS Platform Deployment Design Guide

Introduction

The purpose of this document is to assist customers APS implementers in the design of the overall system architecture to be used in a specific production scenario. To minimize the overall time and costs of implementation and to maximize the performance of the resulting deployment, these guidelines should be considered prior to purchasing hardware or installing software or interfaces.

Getting Help

For assistance please contact us at:

- E-mail support@planettogether.com
- Call: (**888) 317-8807**
- Hours: 8-5 PST

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Platform Components and Networking

This section provides an overview of the individual components of the implementation.

APS Server Manager

The Server Manager is a .Net Windows service that manages all APS components installed on a single Windows Server. The primary functions of the Server Manager are to:

- Manage *Instances*. An Instance is an independent set of APS data. One Instance can contain any number of independent or inter-dependent Plants. Instances do not have inter-dependent schedules. One server can have any number of Instances (subject to hardware limitations). A typical installation will have the following Instances: (1) a production Instance, (2) a training instance, (3) a new version test instance. Each Instance can run a different version of PlanetTogether.
- Install new software versions. The Server Manager allows Instances to be upgraded and tested independently, while preserving existing Instances. This allows for testing and training on new versions of PlanetTogether using the same server without impacting existing production use of the system. Once new versions are tested and any necessary training is complete then test Instances can be converted to Production Instances.
- Send diagnostic alerts. To facilitate quick resolution of any problems, the Server Manager monitors the server for APS log files and can instantly alert internal and external technical support via e-mail of any problems.

APS Services

Each APS Instance has a set of .Net Windows services, listed below, which perform the core server-side functions for the system.

- **APS System service:** This is the main service that contains the scheduling engine. This service must be running for users to login.
- **APS Interface service:** Imports data from other applications into the APS System service. Imports can be from local or remote databases.
- **APS Client Updater service:** Provides automatic update of any client-side files such as customizations and reports so that all APS Clients are in sync and files do not have to be installed on APS Clients.
- **APS Scheduling Agent service:** Controls automatic actions such as imports and optimizations that run at specific frequencies or times.
- **APS Extra Services service:** Publishes data from the APS System service to a (local or remote) SQL Server and provides Shop Views data to Shop View Clients.

APS Enterprise Client

The Enterprise Client is a .Net ClickOnce application that provides universal remote login to and optional control of all system Instances. Each Enterprise Client can connect to any number of Server Managers and provide the following functions:

- Launch the APS Client to login to any Instance on any connected Server Manager
- Add, edit, and delete Instances on any connected Server Manager
- Install new PlanetTogether software versions on any connected Server Manager
- View and send diagnostic data for Instances on any connected Server Manager

APS Client

The APS Client is a .Net ClickOnce application that is the primary application run by end users to view and modify APS plans. The APS Client can be launched from the Enterprise Client or launched directly from a Web Browser.

APS Shop Views Client

The APS Shop Views Client is a .Net ClickOnce application that provides a simplified user interface to the production schedule typically used by shop floor personnel to view schedule dispatch lists and update production status. The APS Shop Views Client can be launched from the Enterprise Client or launched directly from a Web Browser.

Component Networking

The Client applications shown above connect across networks using Windows Communication Foundation (WCF) services and Microsoft .Net Remoting. The components can communicate across local area networks (LANs) and/or wide area networks (WANs). Network bandwidth usage tends to be very low after clients are logged in and startup data has been transferred from the server to the client.

Multi-Plant Deployment Scenarios

For installations that will support multiple production plants, there are several configuration scenarios to choose between as described below.

Single-Server, Single-Instance

In this scenario, as illustrated below:

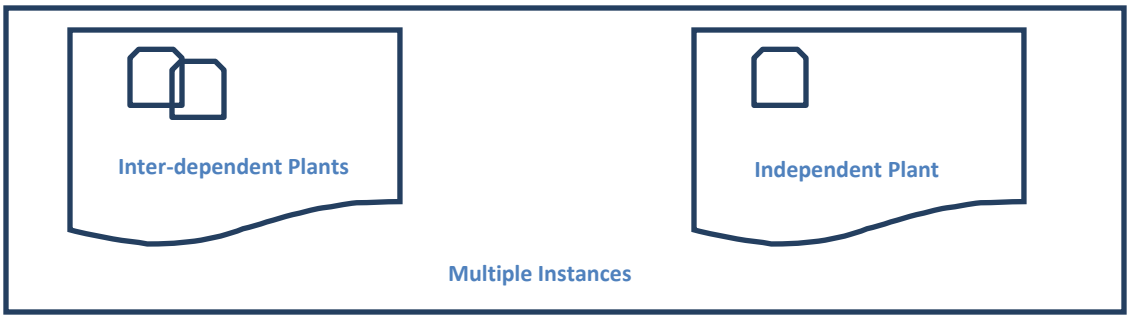
- A single Windows server is used
- A single Instance is created in the Server Manager
- The one Instance contains all plants which are interdependent – schedule changes in one Plant can dynamically affect schedules in other Plants.



Single-Server, Multi-Instance

In this scenario, as illustrated below:

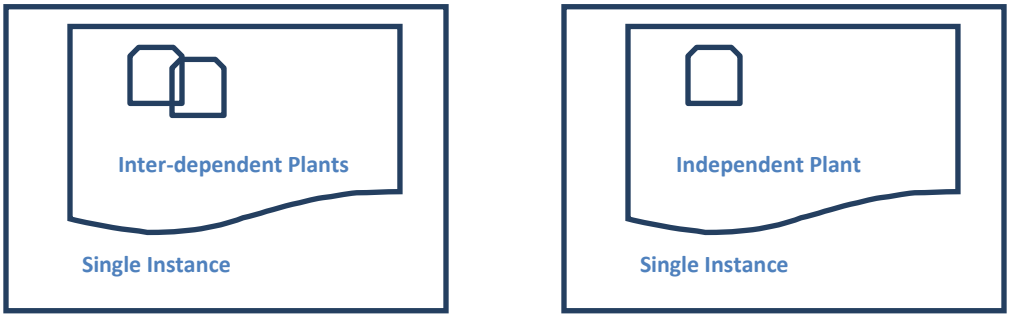
- A single Windows server is used
- A separate Instance is created in the Server Manager for each Plant. (Each Instance can actually contain any number of Plants so, for example, two inter-dependent Plants could be in one Instance and one independent Plant could be in the second Instance.)
- The Plants that are in separate Instances are independent – changes in one Plant's schedule do not affect the other Plants. (Note that independent Plants in separate Instances can potentially be made "loosely inter-dependent" by passing material dependences through the ERP system.)



Multi-Server

In this scenario, as illustrated below:

- Multiple Windows servers are used
- One or more Instances is created in each server's Server Manager
- Inter-dependent Plants are placed in shared Instances while independent Plants are placed in their own Instances.



Multiple Servers

How to decide between these scenarios

If…	Then choose…
Plants are interdependent (They share resources or materials.) and can share a common set of integration mappings.	Single-Server Single-Instance
Else if…	Then choose…
Data volumes are not excessive* and a lower cost, lower server admin is desired	Single-Server Multi-Instance
	Else for maximum performance choose
	Multi-Server Single-Instance

* Actual performance depends on many factors such as the routing structures, BOM structures, constraints, scheduling rules, etc. However, as a general estimate, if more than 5,000 operations will be scheduled per CPU core then a Multi-Server design should be used for better performance. For the most accurate appraisal, it is highly recommended that sample data be created prior to committing to a given system design.

Hardware and Software Prerequisites

Recommended

These are the recommended hardware and software for running PlanetTogether in a production environment.

- Please pay special attention to the monitor size, processor speed, and memory (RAM) requirements as these tend to have the greatest impact on the user-friendliness and productivity of the solution.

Server

PlanetTogether is often installed along with an ERP (Enterprise Resource Planning) System on the same server. A dedicated server is not always required, however depending on the size of your dataset, frequency of rescheduling, and load from other applications a dedicated server may be preferred. As a general guideline, if there are more than a five thousand operations to be scheduled per CPU core then a separate server might be better to avoid any performance conflicts between PlanetTogether and the ERP software.

- 64 bit Windows Server 2008
- Microsoft .NET Framework 4.0 or newer
- Remote Desktop (for remote support)
- 3 GHz quad core processor*
- 8 GB of physical RAM *
- 250 GB of hard disk space
- Microsoft SQL Server 2008
- Any necessary ODBC drivers for connecting to other systems.
- Crystal Reports or any other desired report writer
- Internet access and access to PlanetTogether ClickOnce software site (apsportal.com)

Master Scheduler Client

- 64 bit Microsoft Windows 7 or Windows Vista
- Microsoft .NET Framework 4.0 or newer
- 3 GHz quad core processor *
- 8 GB of physical RAM *
- 100 GB of hard disk space
- 30" 2,560 x 1,600 resolution monitor
- Internet access and access to PlanetTogether ClickOnce software site (apsportal.com)

View-Only, What-If, Shop Views Client

- Microsoft Windows 7 or Windows Vista 64 bit
- Microsoft .NET Framework 4.0 or newer
- 2 GHz dual core processor *
- 4 GB of physical RAM *

- 50 GB of hard disk space
- 21" UXGA monitor
- Internet access and access to PlanetTogether ClickOnce software site (apsportal.com)

Minimum Recommended

These are the recommended hardware and software for running PlanetTogether in a production environment.

- Please pay special attention to the monitor size, processor speed, and memory (RAM) requirements as these tend to have the greatest impact on the user-friendliness and productivity of the solution.

Server

PlanetTogether is often installed along with an ERP (Enterprise Resource Planning) System on the same server. A dedicated server is not always required, however depending on the size of your dataset, frequency of rescheduling, and load from other applications a dedicated server may be preferred. As a general guideline, if there are more than a five thousand operations to be scheduled then a separate server might be better to avoid any performance conflicts between PlanetTogether and the ERP software.

- 64 bit Microsoft Windows 7, Windows Vista, XP, 2000, or Windows Server 2000 or newer
- Microsoft .NET Framework 4.0 or newer
- Remote Desktop (for remote support)
- 3 GHz dual core processor *
- 4 GB of physical RAM *
- 100 GB of hard disk space
- Microsoft SQL Server 2005 or newer (for Web based reporting and integration)
- Any necessary ODBC drivers for connecting to other systems.
- Crystal Reports or any other desired report writer
- Internet access and access to PlanetTogether ClickOnce software site (apsportal.com)

Master Scheduler Client

- 64 bit Microsoft Windows 7, Windows Vista, XP, 2000
- Microsoft .NET Framework 4.0 or newer
- 3 GHz dual core processor *
- 4 GB of physical RAM *
- 50 GB of hard disk space
- 21" UXGA (1600 x 1200) monitor
- Internet access and access to PlanetTogether ClickOnce software site (apsportal.com)

View-Only, What-If Client

- Microsoft Windows 7, Windows Vista, XP, 2000
- Microsoft .NET Framework 4.0 or newer
- 2 GHz processor *
- 4 GB of physical RAM *
- 50 GB of hard disk space
- 17" UXGA monitor
- Internet access and access to PlanetTogether ClickOnce software site (apsportal.com)

* For schedules with over approximately 5,000 operations (across all Instances) more RAM and hard drive space may be required.

Deployment FAQ

Prior to installing the software there are several questions that should be answered to make sure that the best overall configuration is chosen.

- On which server and client computers will the software be installed? Do the computers satisfy the required hardware and software prerequisites and recommended capabilities? Will PlanetTogether be installed on the same server as the ERP software?
    - Please see the hardware and software recommendations section above.
    - Note that for integration purposes it is NOT necessary to install PlanetTogether on the same server as your ERP system. PlanetTogether can import and export to any server on the network.
- Is a separate "test Instance" or "test server" going to be created for use during initial setup and for testing subsequent upgrades?
    - Since PlanetTogether does not perform any "transactions" that affect your ERP software it's not usually necessary to setup a test environment on a separate server. Test Instances are usually a sufficiently safe way to test upgrades since each Instance can run with its own version of the software.
    - If your ERP system is setup with a test and live database then it's possible to reconfigure each PlanetTogether Instance to pull from one or the other. This can allow you to initially setup using your test ERP database and later cut-over to your live database without having to have a separate test and live server for PlanetTogether. Note however that if running only a single PlanetTogether Instance then it is not a simple task to load multiple ERP databases into PlanetTogether at the same time. Use of both a Production Instance and Test Instance is recommended.
    - When first performing a schedule "publish" to update your ERP system it's recommended that the update be limited to a few production orders or performed on a test database to avoid any problems associated with updating the ERP data.
- Will any type of virtualization be used such as Citrix? How will this affect the configuration?
    - As a Microsoft .Net application, PlanetTogether can run in any environment that .Net supports.
    - One restriction is that due to the fact that the license key is hardware specific, the PlanetTogether server components cannot virtualize across servers – the license key is for a particular server.
- Where should the system data be stored to make it easy to perform daily backups?
    - During the server installation you can choose where the data should be stored. The default is **C:\ProgramData\PlanetTogether**. (or wherever your CommonAppData environment variable is set.)
    - The data folder can be a mapped drive or a local drive.
    - Be sure to backup this folder and any SQL Server databases customized for integration purposes (with custom Views, stored procedures, etc.).
- Will remote access to the server be granted to the implementers and/or administrators? What security rights will be needed?

    - For efficient implementation and go-live support we highly recommend granting remote access to your implementation consultants and administrators. This helps by providing quick access to needed folders and configuration settings as the system is setup and tested. Usually a VPN connection and Remote Desktop connection is setup.
    - The following types of access will typically be needed:
        - SQL Server Management Studio access to browse ERP data and to configure views and stored procedures in the PlanetTogether SQL database.
        - If using integrated security, the APS Interface Service will need to run under an account that has read and possibly write access to the PlanetTogether database.
- Are there any proxy servers or firewalls that will prevent the server or clients from accessing the Microsoft ClickOnce deployed APS applications? The site to be accessed is: apsportal.com. If it is not possible to provide this access than workarounds exist for manually installing software but the simplified ClickOnce deployment will not be usable.
- Are there any other special systems considerations that need to be considered prior to installing the software?