Smart 3D Setup and Administration

Smart 3D 2014R1

INTERGRAPH®

Prerequisites for this class

- Experience with Microsoft Windows Operating System architecture
- Experience with Microsoft SQL Server 2008 or Oracle 11g database server administration
- Knowledge of 3D Plant Design CAD Concepts

Agenda

Day 1

- Introduction to Smart 3D (concepts, terminology)
- System Setup
- Project Hardware Sizing
- Project Setup (Database Creation, permissions)

Day 2

- Backup and Restore
- Project Management (delete plants, delete catalogs, hierarchy icons, create catalog)
- Plant Organization (Systems hierarchy)
- Smart 3D Common Applications

Agenda (Cont'd)

Day 3

- Optimization for Roles
- Set Default colors
- Model Data Reuse
- Synchronize Model with Catalog
- Database Maintenance
- Database Integrity

Day 4

- Error Logs and Memory monitor
- Interference Checking Service
- PDS project Reference
- Point Cloud Reference
- Reference 3D (R3D) Part I

Agenda (Cont'd)

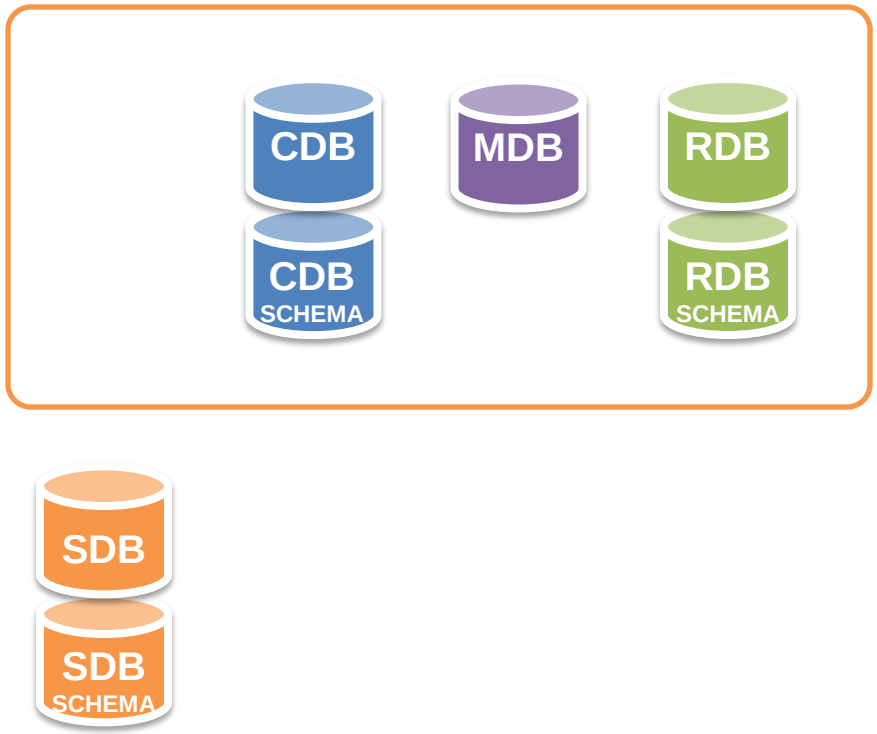
Day 5

- Reference 3D (R3D) Part II
- Intergraph Batch Services
- Database conversion wizard (SQL⟷ORACLE)
- Plant version upgrade

SMART 3D INTRODUCTION

Smart 3D - Database architecture

Plant Configuration



Site
Site Schema
Catalog
Catalog Schema
Model
Reports
Reports Schema

Smart 3D - Database architecture

Plant Configuration

Site
Site Schema
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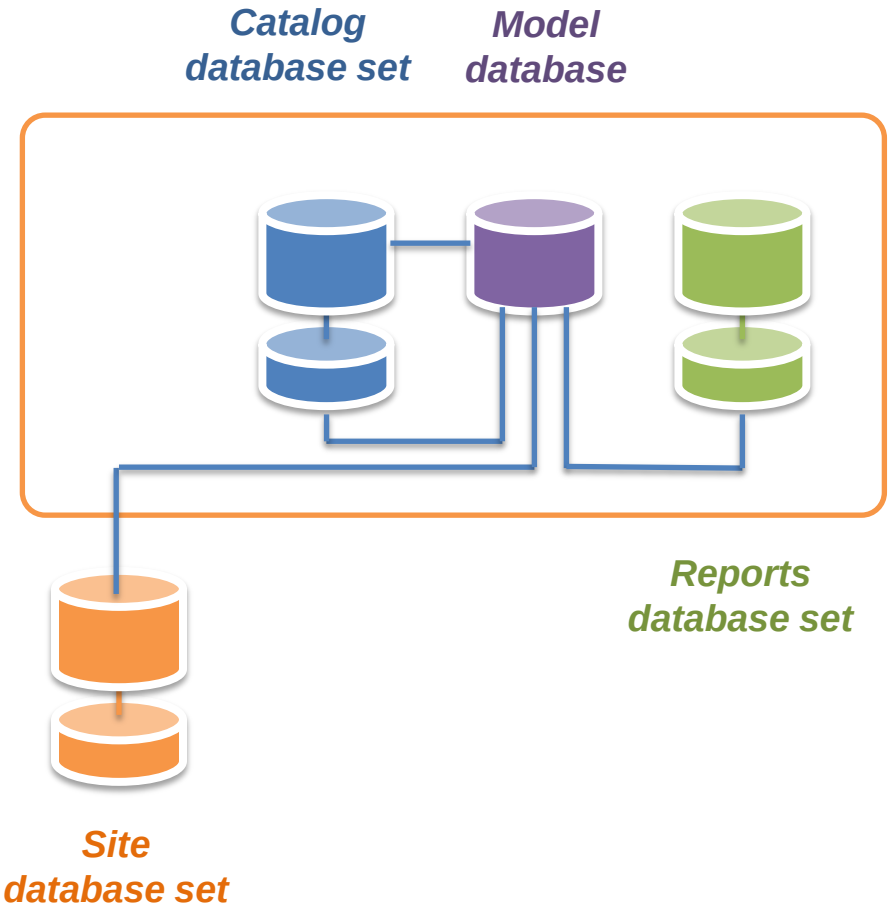
Smart 3D - Database architecture

Plant Configuration



Site database set:
Contains configuration and connection information and links the rest of the databases.

Catalog database set:
Contains the Reference Data used by all disciplines.
Store Design Modules (assemblies), Catalog Filters

Model database:
Contains and organizes all of the three-dimensional objects in the plant, referenced objects data.
Stores definition and content of deliverables (Drawings and Reports), Plant and user's Filters, Styles, Surface Style Rules, etc.

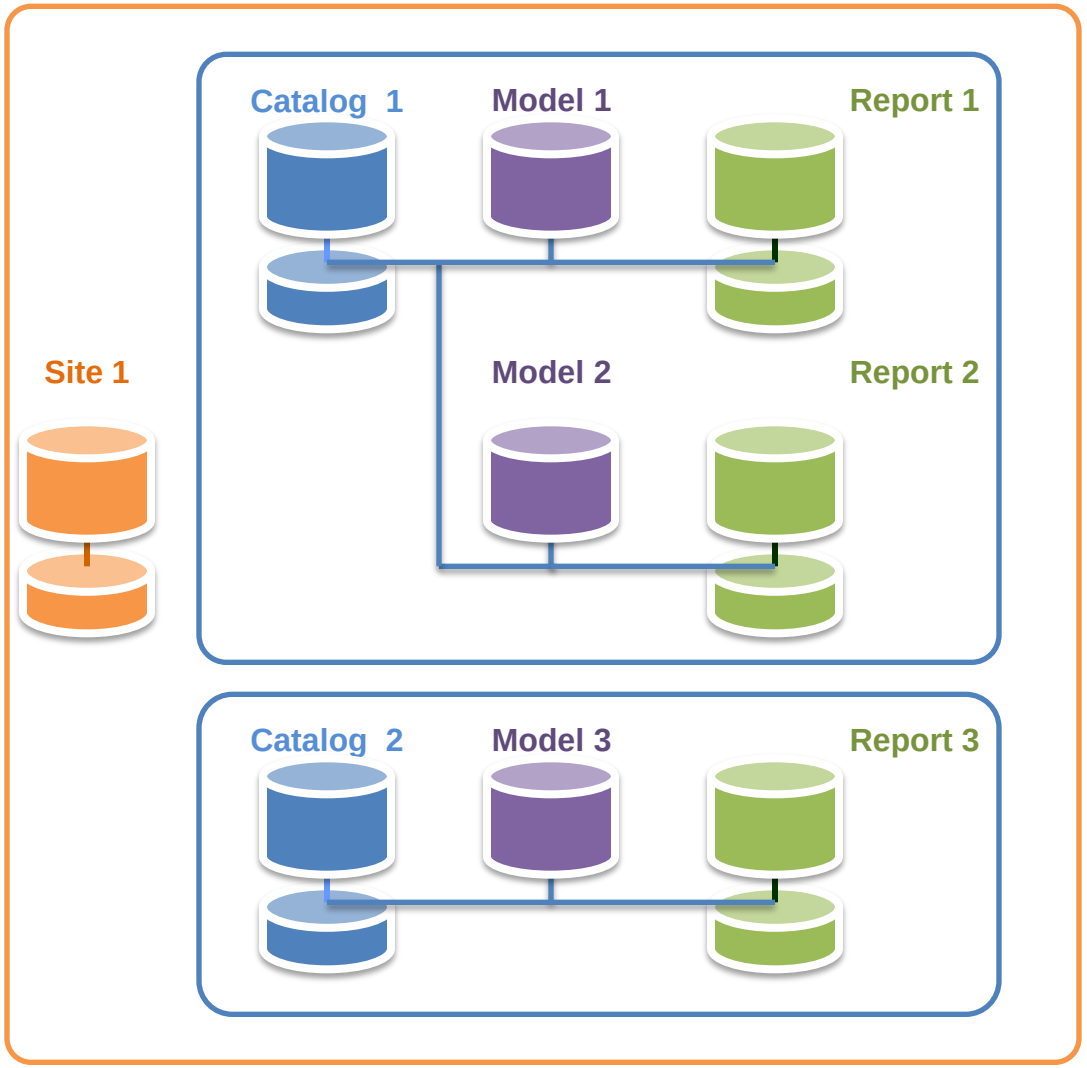
Reports database set:
Optimize data retrieval from other five databases.

Smart 3D - Database architecture

Plant Configuration options

Multiple Plants can share the same Catalog …

… or exclusively use own Catalog



Smart 3D - Database architecture

Plant Configuration options

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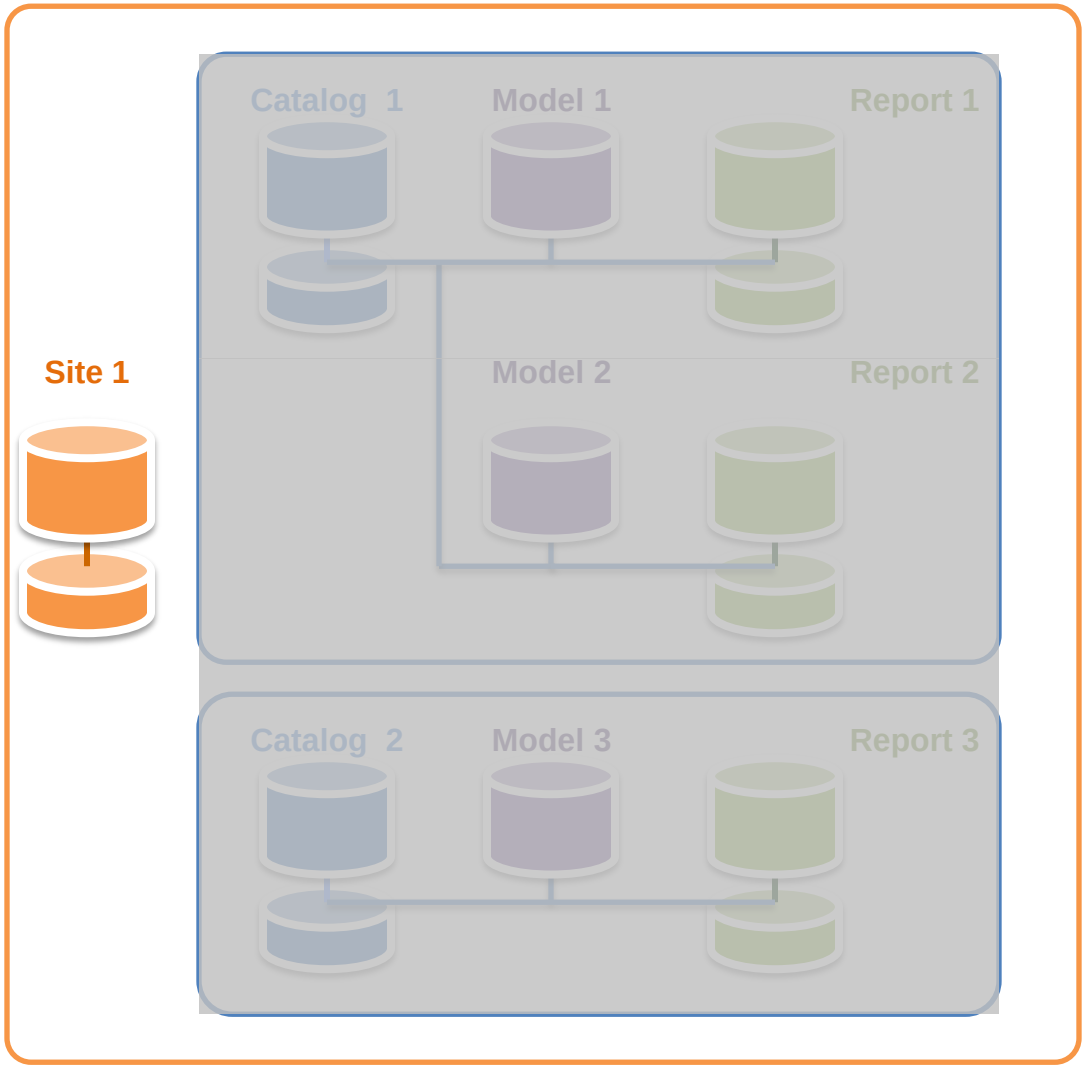
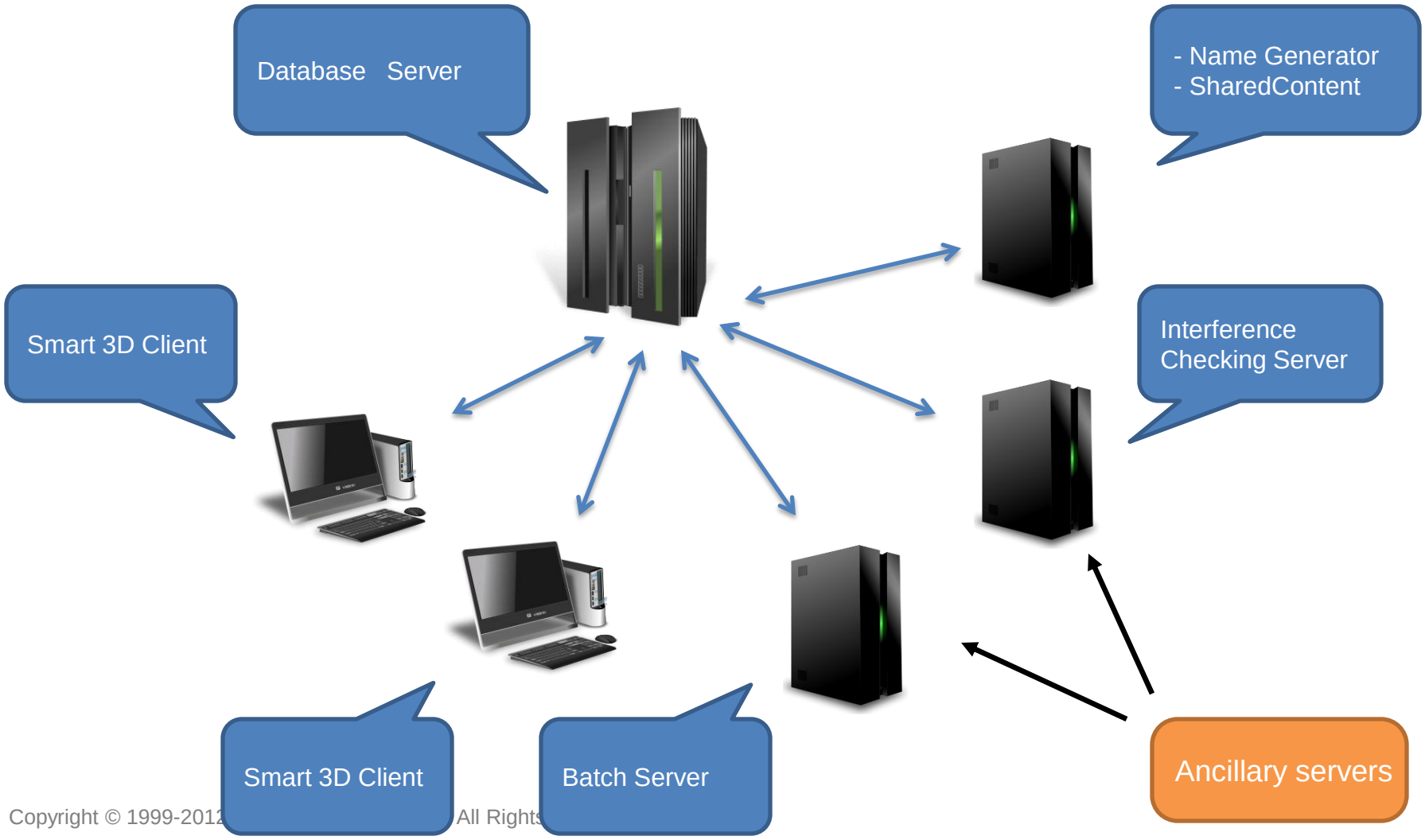
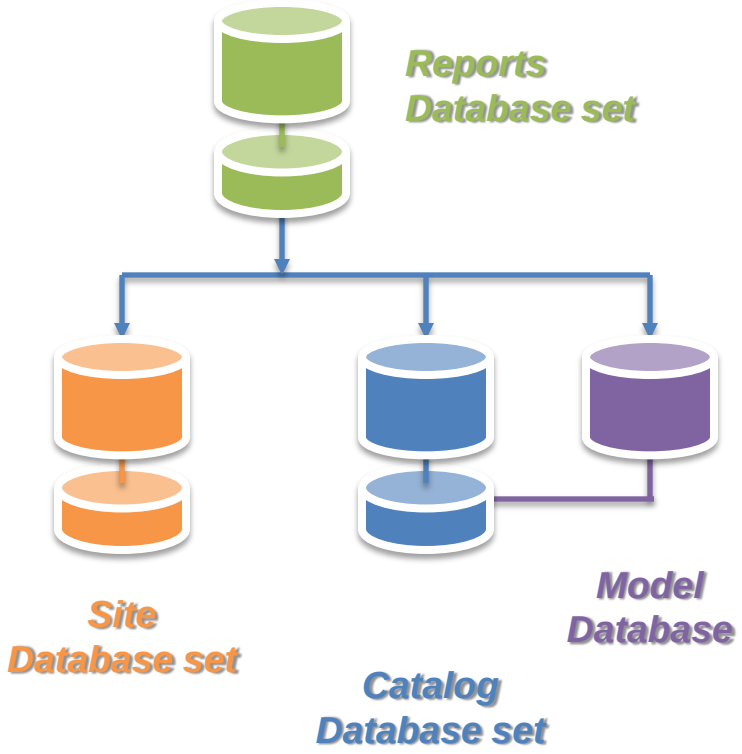


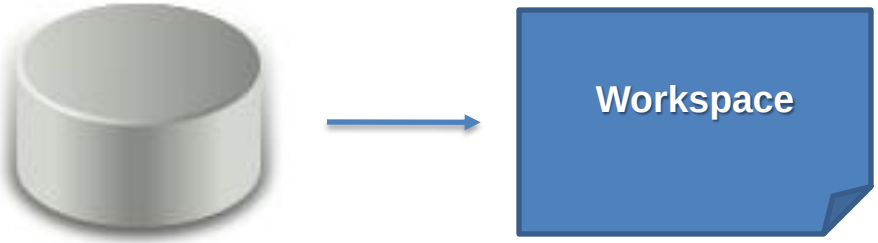
Smart 3D intro: Server - Client architecture



Smart 3D intro: Define Workspace

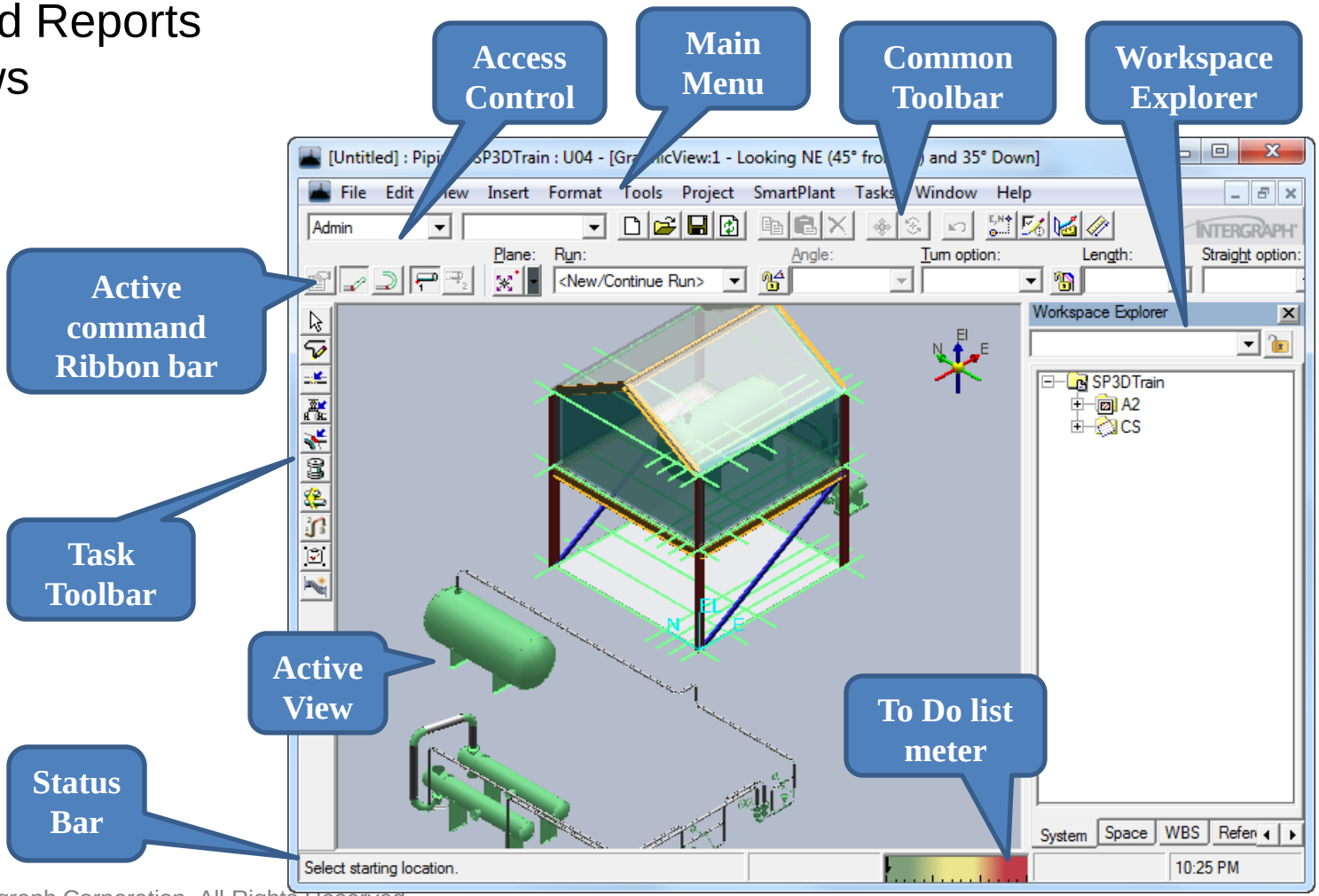
- **Filter on database**
- **Returns only the data you want to see and builds a logical "Working Set"**
  - System
  - Assembly
  - Spatial (Volume or Planes)
  - Logical Permission Groups
  - Object Types/Properties





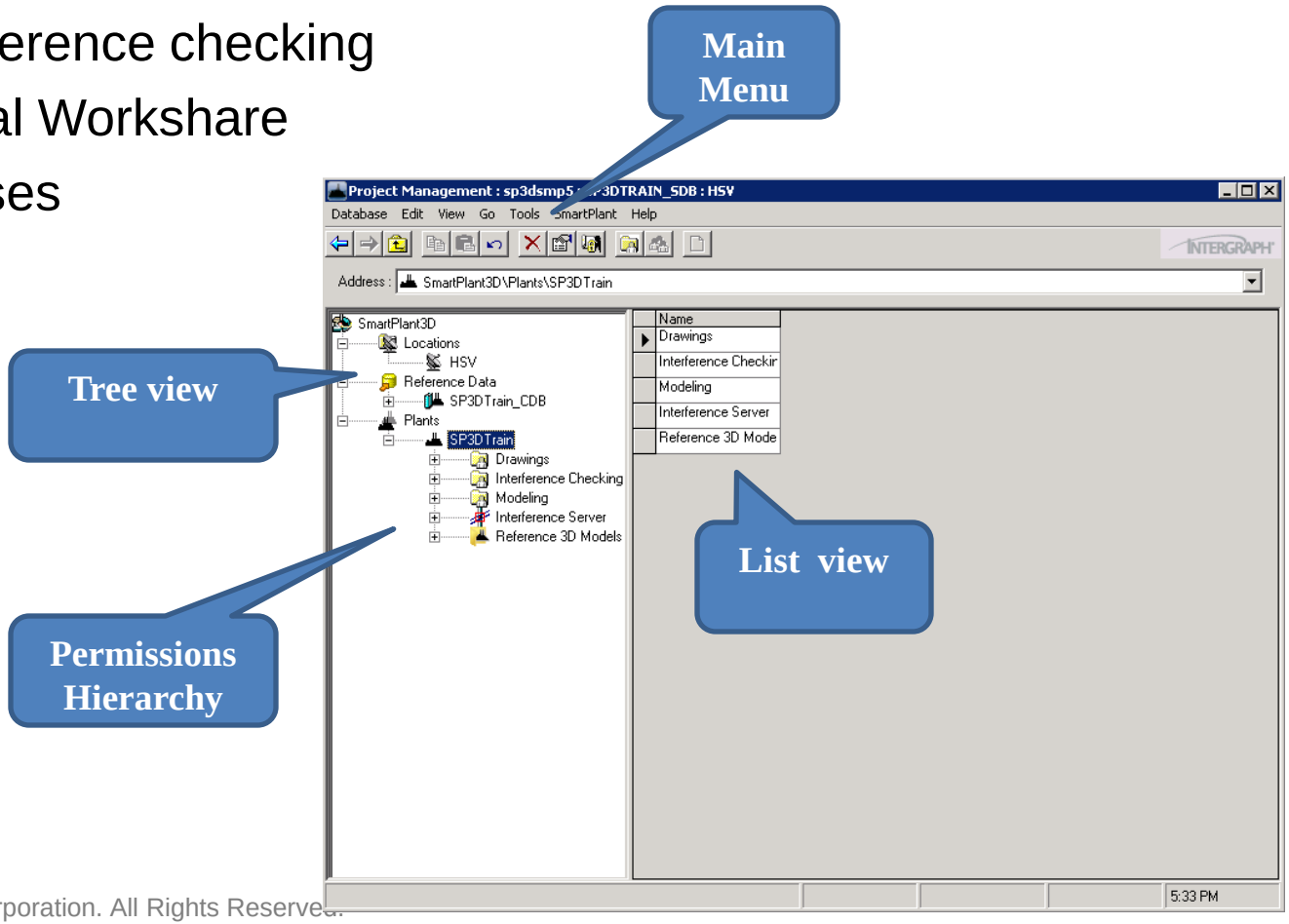
Smart 3D intro: Modeling environment

- Discipline oriented interface
- Drawings and Reports
- Graphic views



Smart 3D intro: Project Management

- Create, backup and restore plants
- Modify user accesses to model objects
- Start/Stop Interference checking
- Configure Global Workshare
- Migrate databases



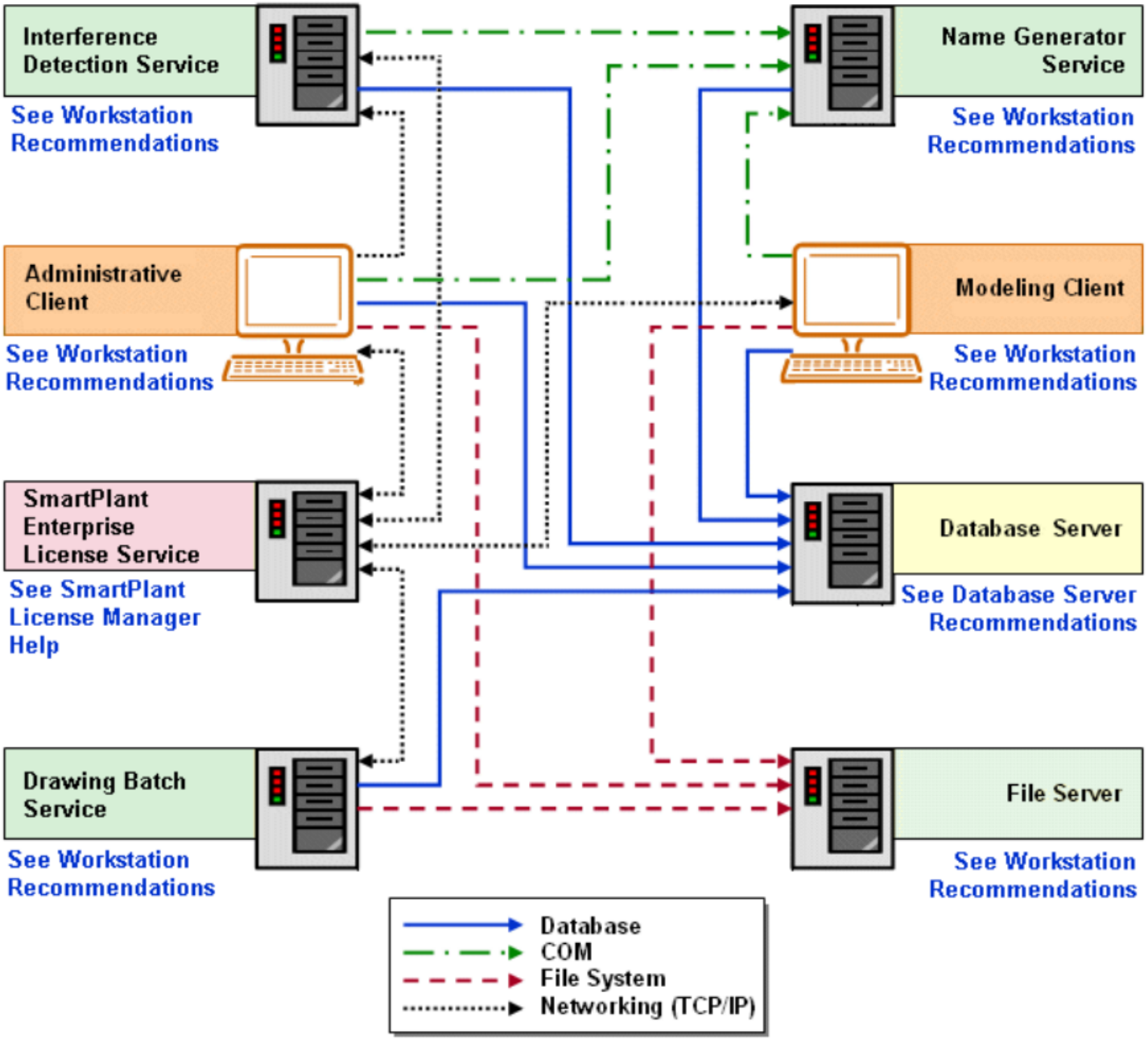
Smart 3D intro: Relationships and Integration

- Smart 3D synchronizes key elements of integration and relationships.
- Integration - Smart 3D allows multiple engineering disciplines to work concurrently and in real-time against relational databases.
- Relationships - Smart 3D's relationship manager controls design changes across disciplines, which in turn establishes and maintains appropriate behaviors among structures, equipment, and systems.

Smart 3D intro: Administrative guides

- *Smart 3D Release Bulletin*
- *Smart 3D Installation Guide*
- *Smart 3D Installation Checklist*
- *Smart 3D **Project Management User's Guide***
- *Smart 3D Database Integrity Guide*
- *Smart 3D Global Workshare Guide*
- *Smart 3D Interference Checking Guide*
- *Smart 3D Troubleshooting Guide*
- *Smart 3D Point Cloud Guide*

SYSTEM SETUP


Interference Detection Service
See Workstation Recommendations
Name Generator Service
See Workstation Recommendations
Administrative Client
See Workstation Recommendations
Modeling Client
See Workstation Recommendations
SmartPlant Enterprise License Service
See SmartPlant License Manager Help
Database Server
See Database Server Recommendations
Drawing Batch Service
See Workstation Recommendations
File Server
See Workstation Recommendations
Database
COM
File System
Networking (TCP/IP)

System Setup: Smart 3D servers

- One or multiple server machines can be used to provide the following required supporting services:
  - **Database server**
    - Provides hosting services for the Smart 3D databases
  - **Shared content file server**
    - Contains support files for the Smart 3D project, symbol definitions, drawing and reports templates, reference files, translator data, etc.

System Setup: Smart 3D ancillary servers

- Ancillary servers are computers dedicated to perform a specific task with the purpose to offload processing from the main database server.
  - **Name Generator service provider**
    - Generates object names and contains naming rules for object placement and certain administrative functionality
  - **Interference checking (IFC)**
    - Checks interferences between objects in the plant
  - **Intergraph Batch services**
    - Manages scheduling and execution for commands to be processed in batch mode

System Setup: Smart 3D workstation machines

Workstations connected to the database server

- **Administrative clients**
  - Used in administrative and maintenance tasks such as backups, restores, bulkload to catalog, database maintenance and integrity checks, attaching external references, manipulations with large data (MDR)
- **Modeling clients**
  - Contains all discipline related tasks and commands to create objects in a plant
- **Output clients**
  - Contains all discipline related tasks and commands to create deliverables generated from plant

System Setup: Server - Workstation

- Hardware recommendations
- Supported platforms
- Software prerequisites
- Installation

System Setup: Hardware recommendations
Database server

- Intel Xeon® 5600 Series or better (64-bit instruction set, not Itanium®)
- 16 GB to 64 GB or greater RAM depending on project size
- For hard drive size, see “Smart 3D Project Hardware Sizing Recommendations” in the Installation guide
- Backup system for server
- Access to DVD drive, either locally or through a network connection
- 1 GbE or higher network interface for client connections

System Setup: Supported platforms
Database server

- **Supported Operating Systems**
  - Microsoft Windows Standard/Enterprise Server 2008 R2 SP1 (64-bit)
- **Supported Database Servers**
  - Microsoft SQL Server 2008 R1 Service Pack 3 (Standard edition for stand-alone environments; Enterprise edition for Global Workshare environments; 64-bit)
  - Oracle Database 11g Release 2 with patch set # 22 (Standard edition for stand-alone environments; Enterprise edition for Global Workshare environments; 64-bit)
    - If you are going to use Oracle in a Global Workshare configuration, you also need Oracle GoldenGate 11.2.1.0.3, which is separately purchased from Oracle

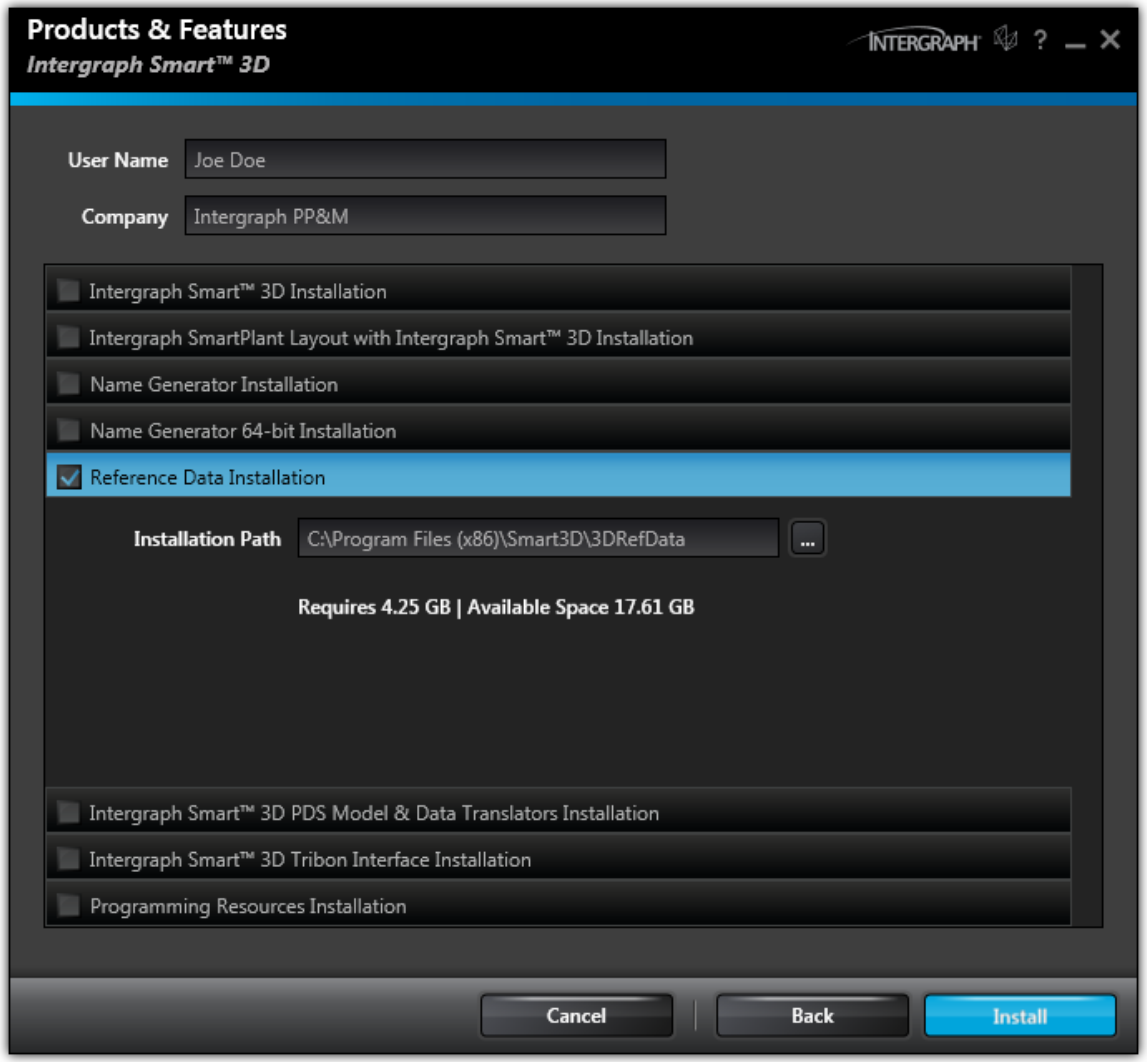
System Setup: Software prerequisites
Database server

- **Software prerequisites**
  - Adobe Reader or equivalent PDF reading software
  - Microsoft XML Core Services (MSXML) 6.0 (Database server only)
  - Microsoft .NET 4.0 (Database server only)

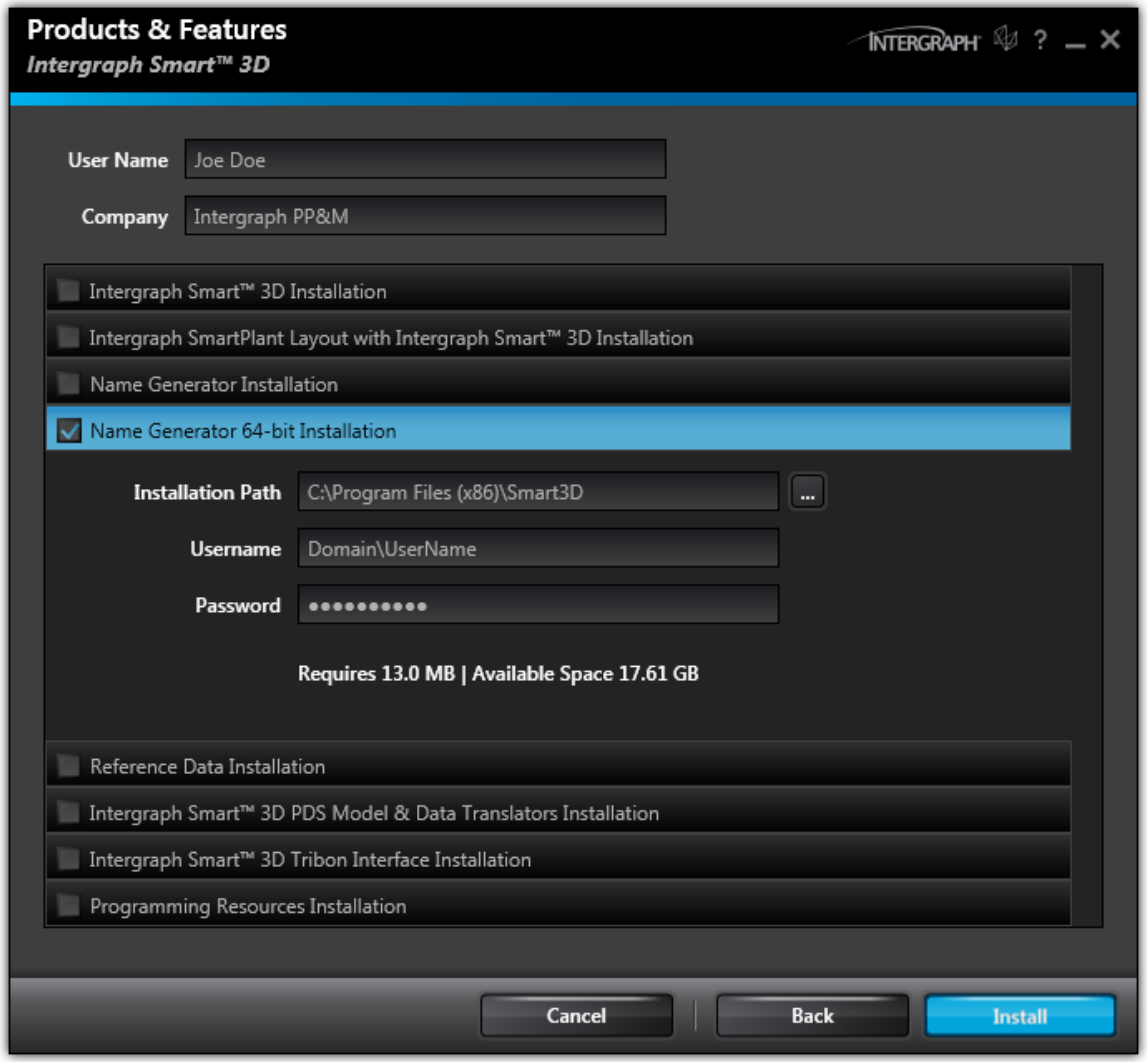
System Setup: Installation of Smart 3D Reference Data – Name Generator

- **Reference Data**
  - Shared Content files
  - Database Templates
  - Oracle initialization scripts
- **Name Generator**
  - COM+ Application
- Launch **Setup.exe** and after agreement to the Software License Agreement terms and conditions select applicable options like e.g. “Reference Data Installation” for the Smart 3D Reference Data server software load or “Name Generator” for the Name Generator installation

System Setup: Installation of Smart 3D Reference Data



System Setup: Installation of Smart 3D Name Generator



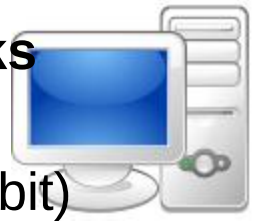
System Setup: Installation of Smart 3D Workstation

- Applicable configurations
  - Administrative Client workstation
  - Modeling Client workstation
  - Interference Detection computer/server
  - Drawing Batch computer/server
  - Duplication and Synchronization computer
  - Smart 3D Piping Specification Remote computer

System Setup: Hardware recommendations Workstation

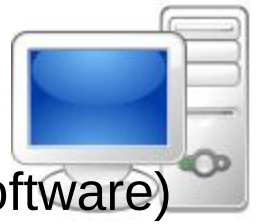
- Intel Core i7, Quad Core
- 6+ GB RAM
- Access to a DVD drive, either locally or through a network connection
- Monitor capable of a minimum of 1280 x 1024 resolution
- 1 GbE network interface
- Graphics card designed for 3D intensive applications that meet the following requirements:
  - 32-bit main RGBA pixel buffer
  - Hardware OpenGL 2.1 support
  - Hardware Z buffer: 24 bit or higher
  - 256 MB RAM
  - 8-bit stencil buffer
  - Hardware Alpha blending support
  - Graphics acceleration set to full
  - Hardware Anti-aliasing support recommended
  - Latest available drivers should be installed

System Setup: Supported platforms
Workstation



- **Supported Operating Systems and required service packs**
  - Microsoft Windows 7 Professional or Enterprise SP1 (64-bit)
  - Microsoft Windows Server 2008 R2 (64-bit) only as a client for Citrix XENDesktop 7.0
- **Supported database clients and required versions**
  - Microsoft SQL Server 2008 R1 client SP3 (32-bit or 64-bit)
  - Oracle 11g Release 2 client 32-bit with Patch set # 22
  - Oracle 11g Release 2 Client 64-bit with Patch set # 22 - *only applicable with Smart 3D 64-bit services (IFC and Drawings Batch)*

System Setup: Software prerequisites Workstation



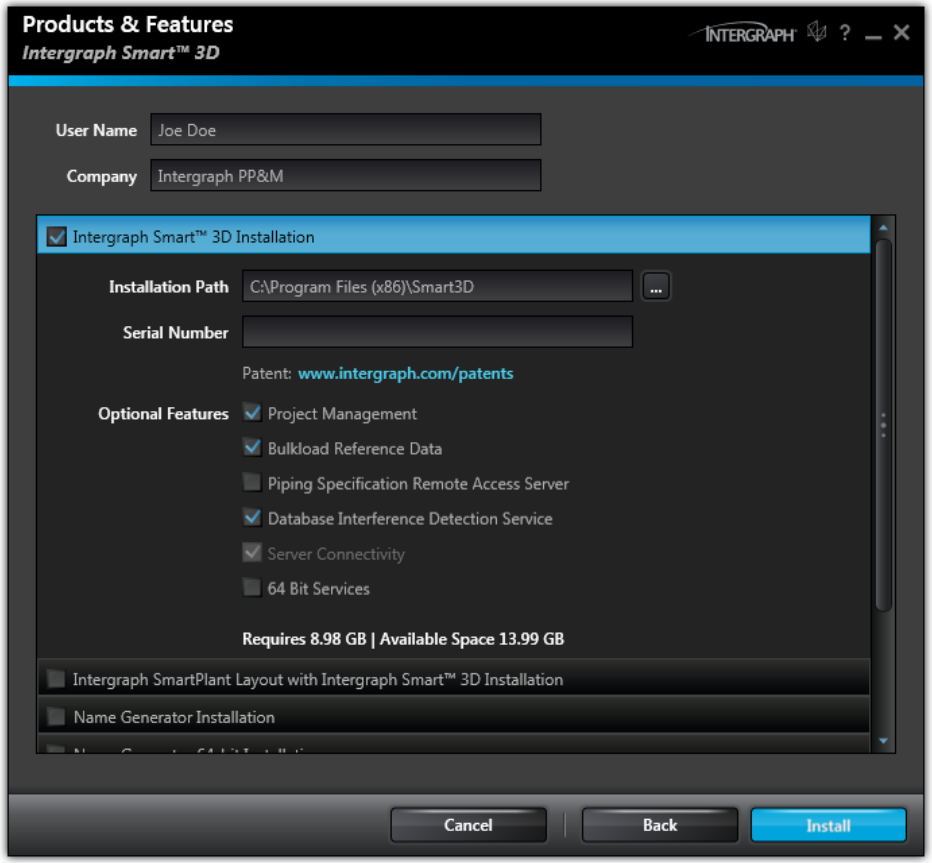
- **Software prerequisites**
  - Microsoft Internet Explorer 9.0
  - Adobe Reader 9.0 or higher (or equivalent PDF reader software)
  - Microsoft XML Core Services (MSXML) 6.0 SP1
  - Microsoft .NET Framework 4.0
  - Database system client software (SQL or Oracle)
    - Microsoft SQL Server 2008 R1 client SP3 (64-bit) [Optional]
    - Oracle 11g Release 2 client with Patch set # 22; 32-bit and 64-bit(Oracle “Light Client” will not work) 64-bit Oracle client is *applicable for 64-bit Smart 3D services (IFC and Drawings Batch)*
  - Microsoft Office 2010 (32-bit only)
  - SmartPlant License Manager 11.0 or later

System Setup: Optional software Workstation

- **Intergraph Smart 3D Schema Component 2014R1 (05.01.00.0018)**
  - Allows publishing to SPF or 3D Model generation
- **Intergraph Batch Services 06.01.08.00**
  - Allows scheduling commands for batch and/or remote processing
- **PDS Data Access components**
  - Allows referencing or export of PDS Projects
- **Solid Edge Version 20 or ST3**
  - May be used for creating equipment symbols
- **Visual Basic 6 with SP6 (Visual Studio 2008 for .NET API)**
  - Allows creation of graphic visual basic symbols, macros, custom rules, etc.
- **Point Cloud vendor software**
  - Allows referencing Point Cloud projects in SP3D

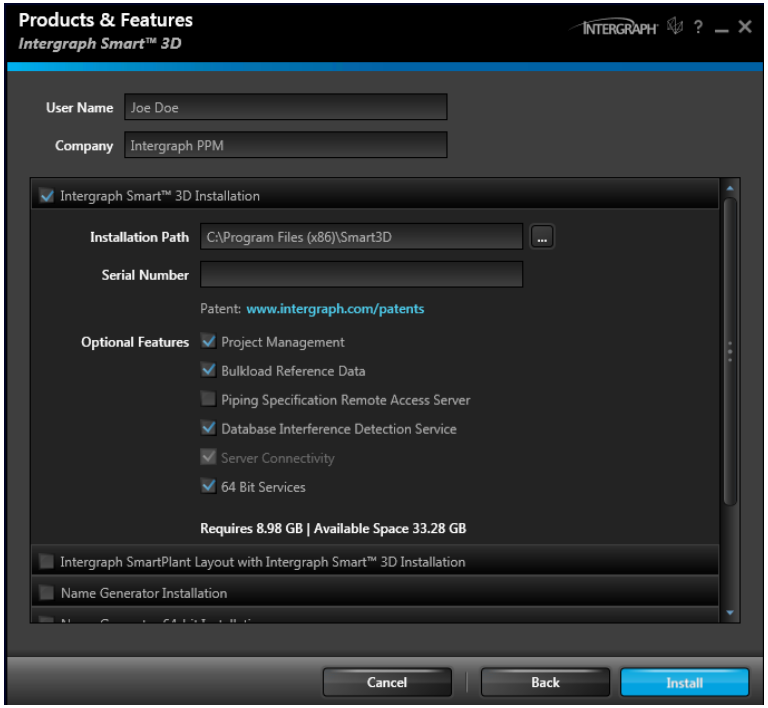
System Setup: Installation of Smart 3D Design /Admin Client Installation

- Launch setup.exe and select “Smart 3D Installation” for the Smart 3D workstation setup.



System Setup: Installation of Smart 3D 64-bit Services

- 64-bit Services can be used for IFC service and/or Drawing Batch Services



- These cannot be uninstalled individually, need to uninstall Smart 3D software.

SMART 3D SETUP

Smart 3D Setup

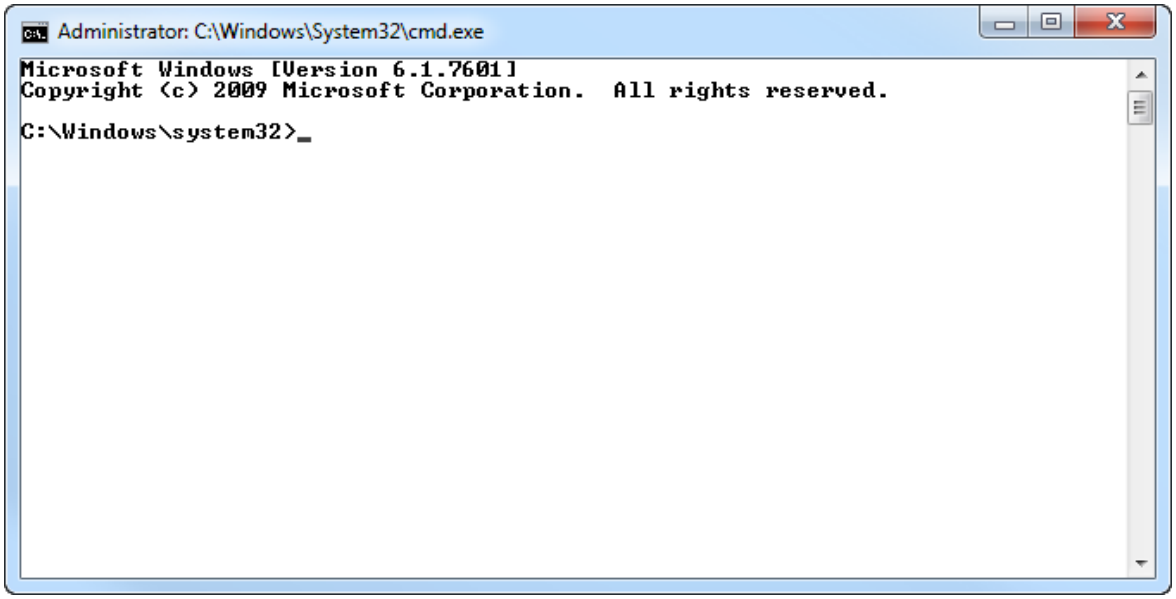
Software versioning is based on the different releases.

- RTM - Release To Manufacturing (CD/DVD)
- Service Packs
- HotFixes

Current version: Smart 3D 2014R1 (10.01.15.0060)

Smart 3D Setup: Silent Install

- Smart 3D Can be installed through command line
- Ideal to reduce deployment and maintenance impact
- Service Packs or Hotfixes support silent install



Smart 3D Setup: Silent Install

- S3DInstallation.exe **SERIALNUMBER**=### **SLAACCEPT**=YES [INSTALLDIR=<Path>] [X64SERVICES=Yes] [ADDLOCAL=Feature1,Feature2] [REMOVE=Feature1,Feature2]

Smart 3D Setup

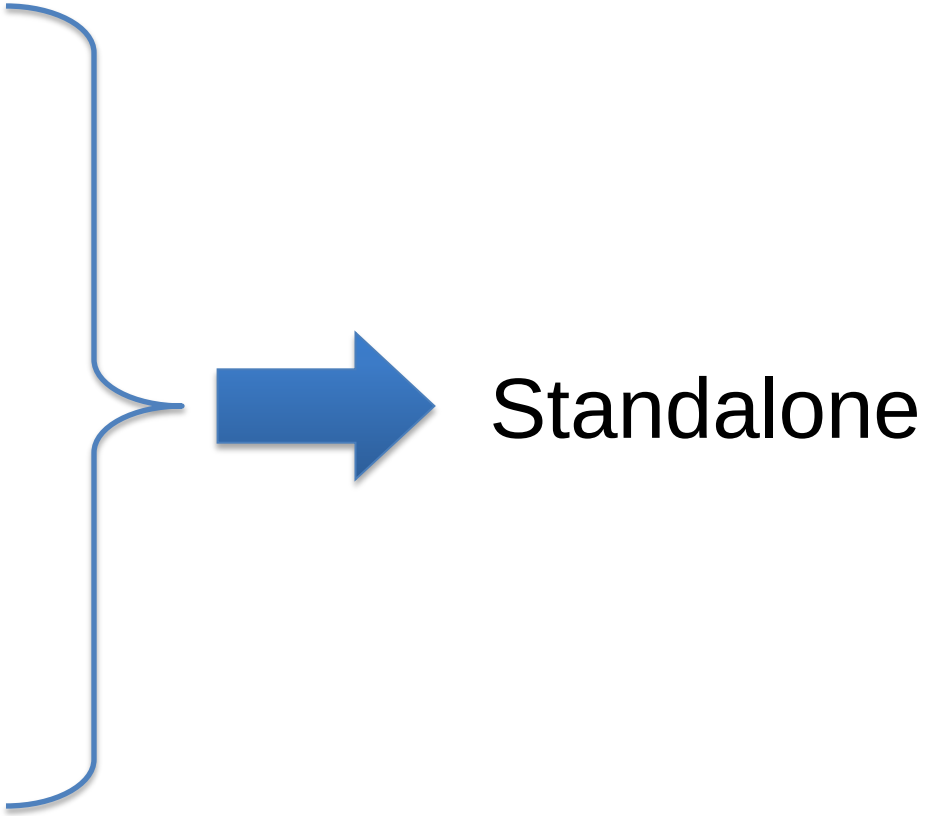
- Three different ways to configure Smart 3D.

Server

Name Generator
Shared Content

Workstation

Project Management
Bulkload
IFC…

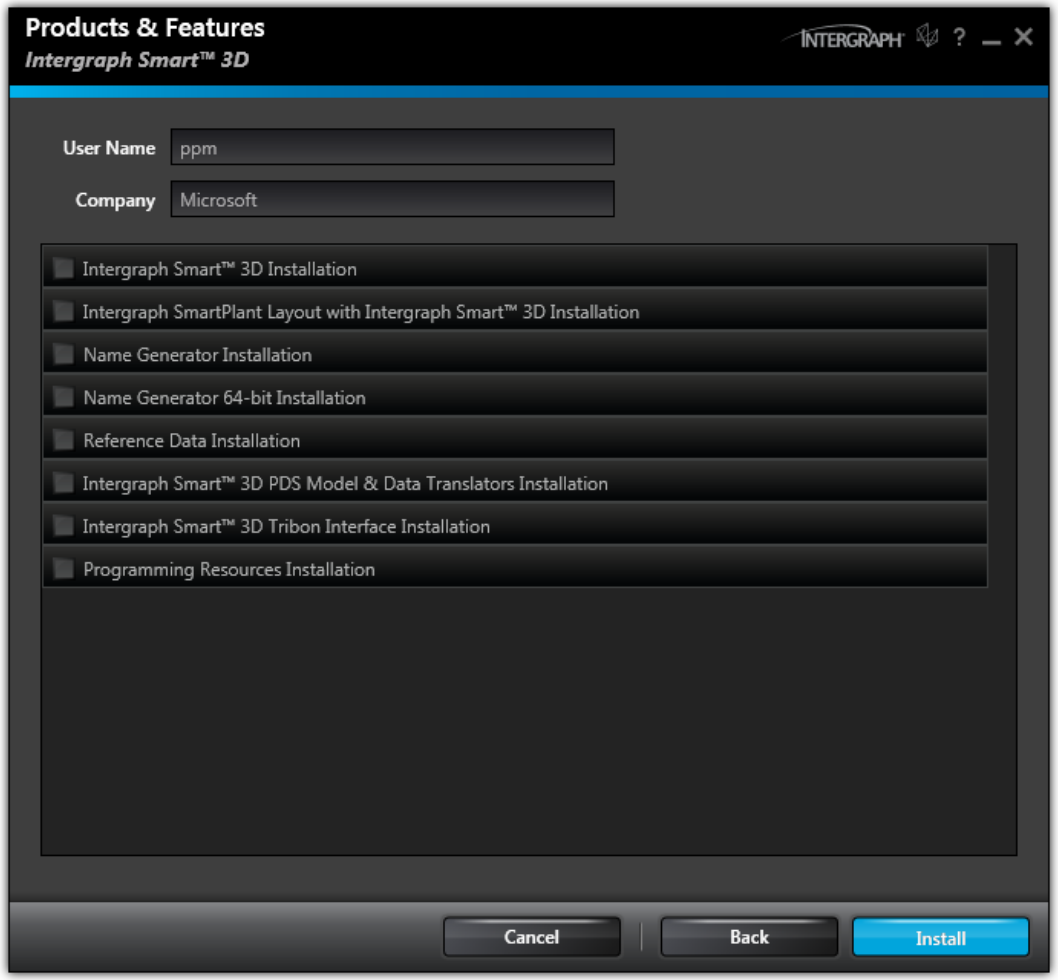


Smart 3D Setup

Before Installing…

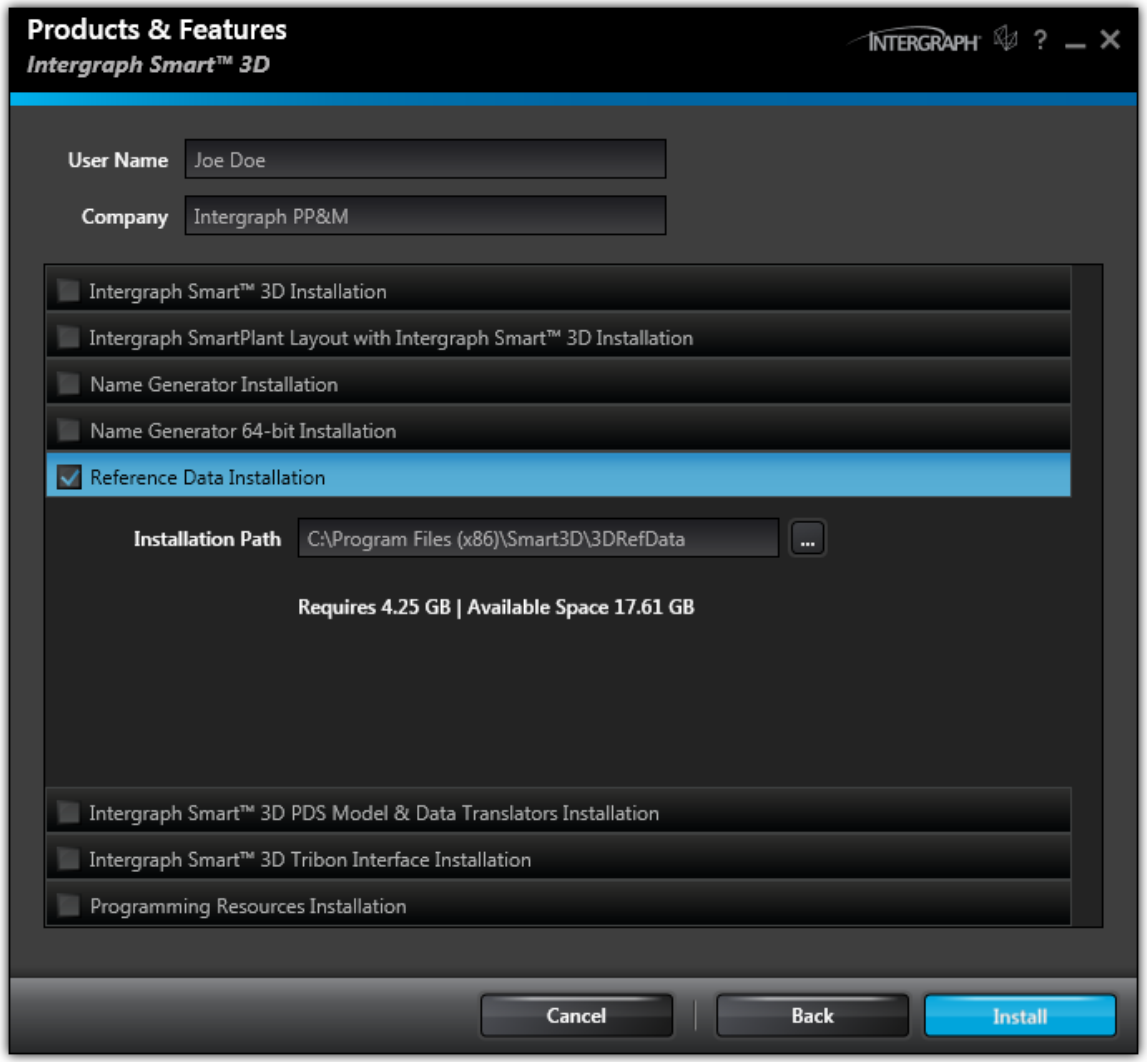
- Use an account with administrative privileges.
- If installing under Windows 7 or Windows 2008, execute setup.exe with the option “Run as Administrator”
- Verify that all prerequisite software was installed.
- Don't skip any restart recommended by the software.

Smart 3D Setup: Splash screen

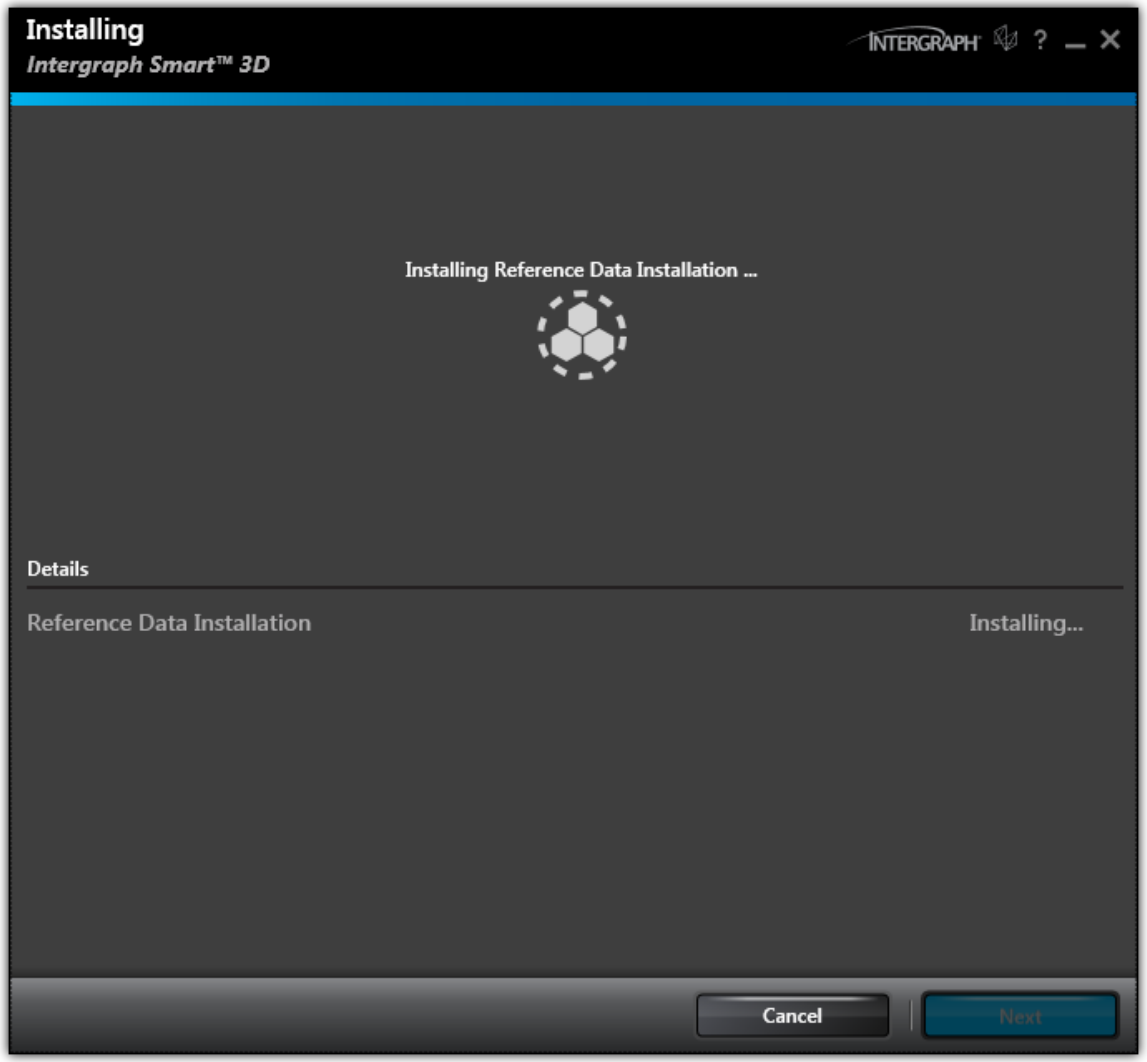


Reference Data installation

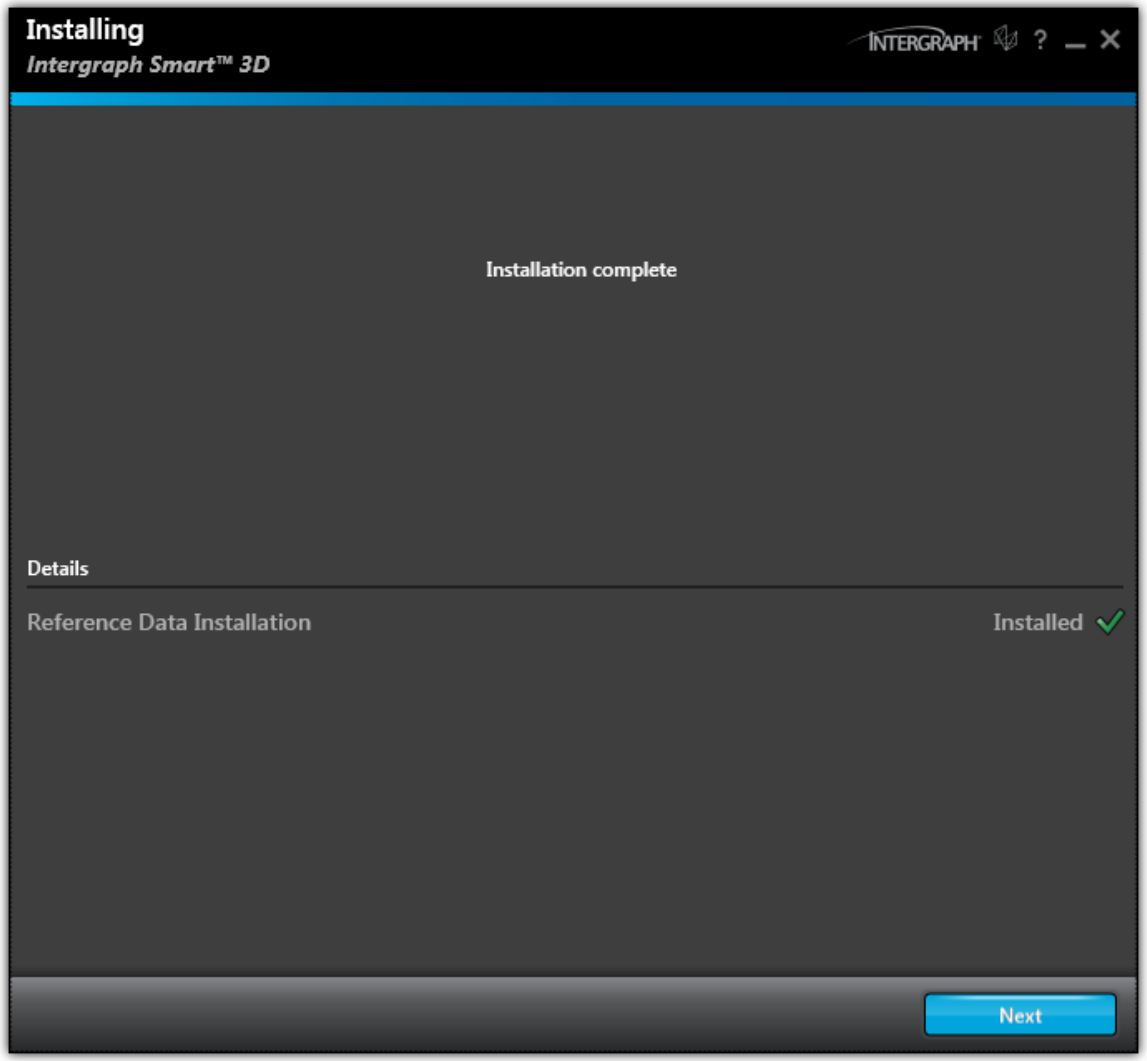
System Setup: Installation of Smart 3D Reference Data



Smart 3D Setup: Reference Data



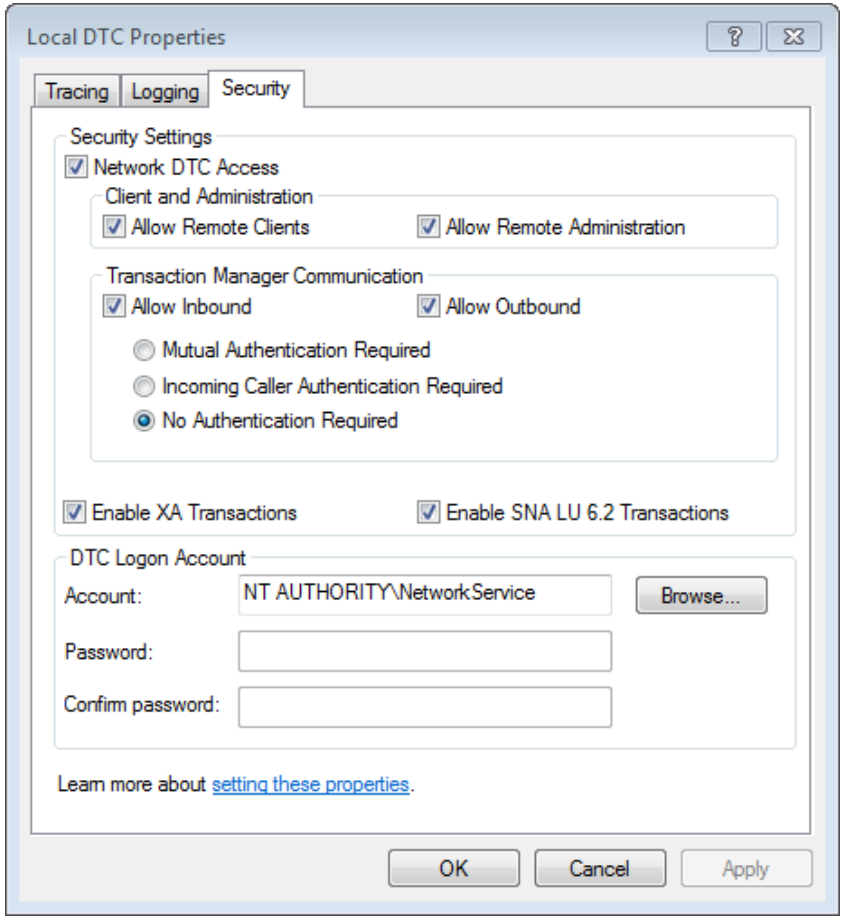
Smart 3D Setup: Reference Data



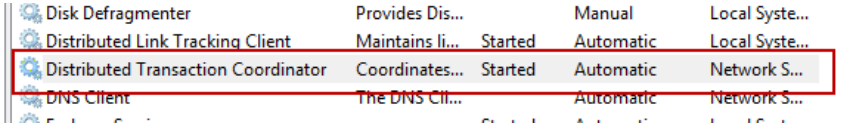
Name Generator installation

- Configure extra MSDTC settings to allow remote clients and remote administration of COM+ applications

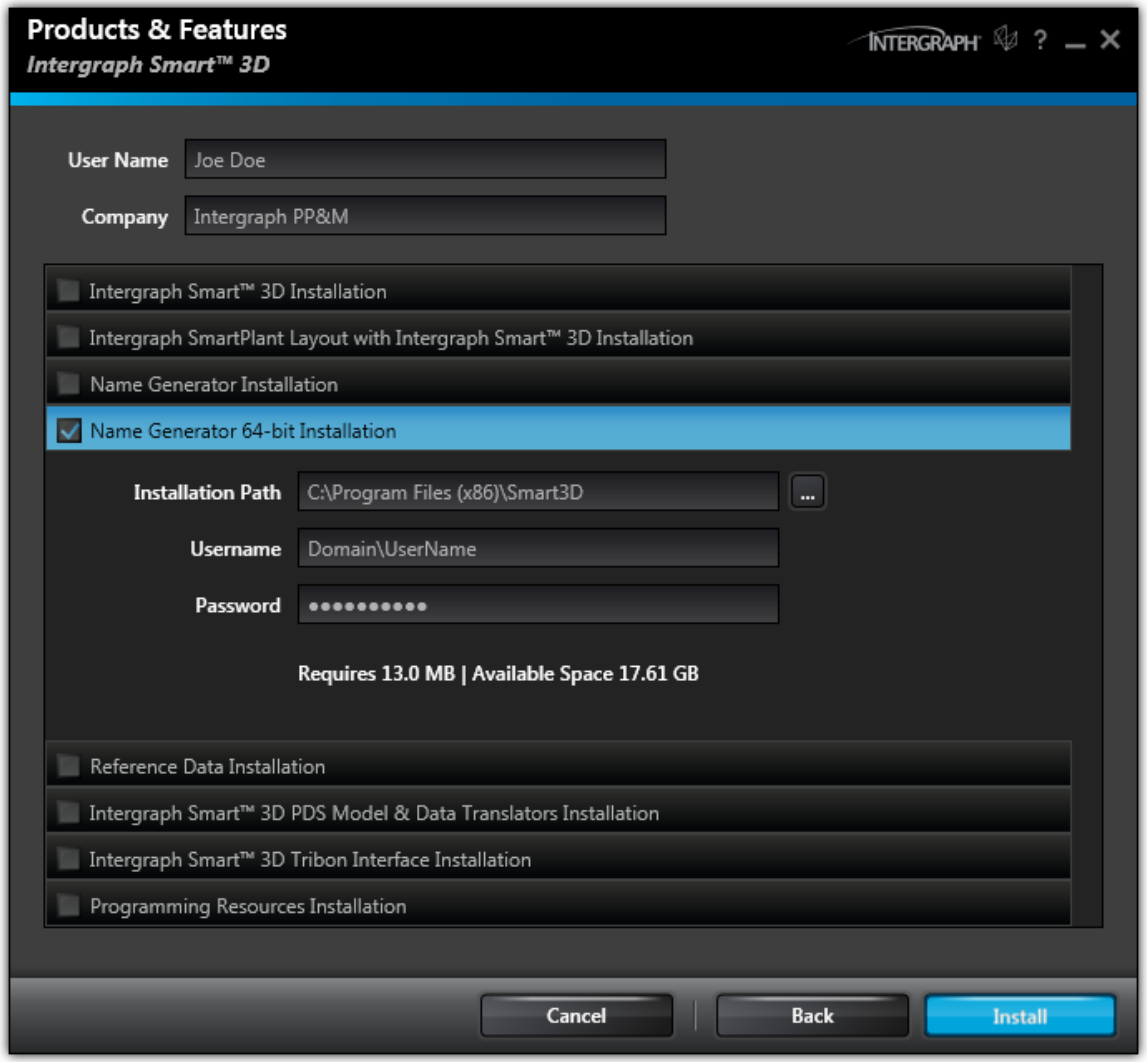
Smart 3D Setup



MSDTC Settings

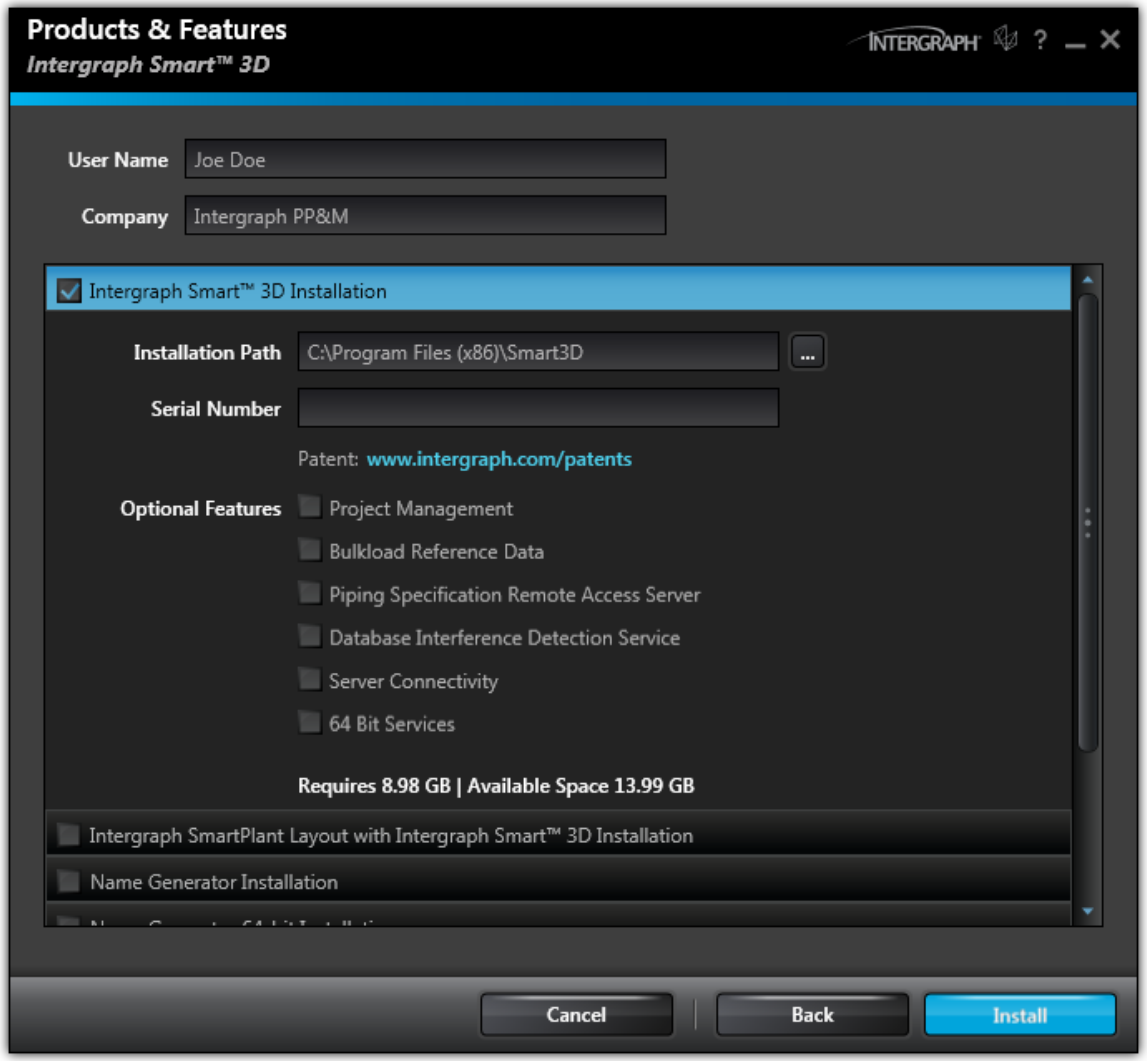


System Setup: Installation of Smart 3D Name Generator

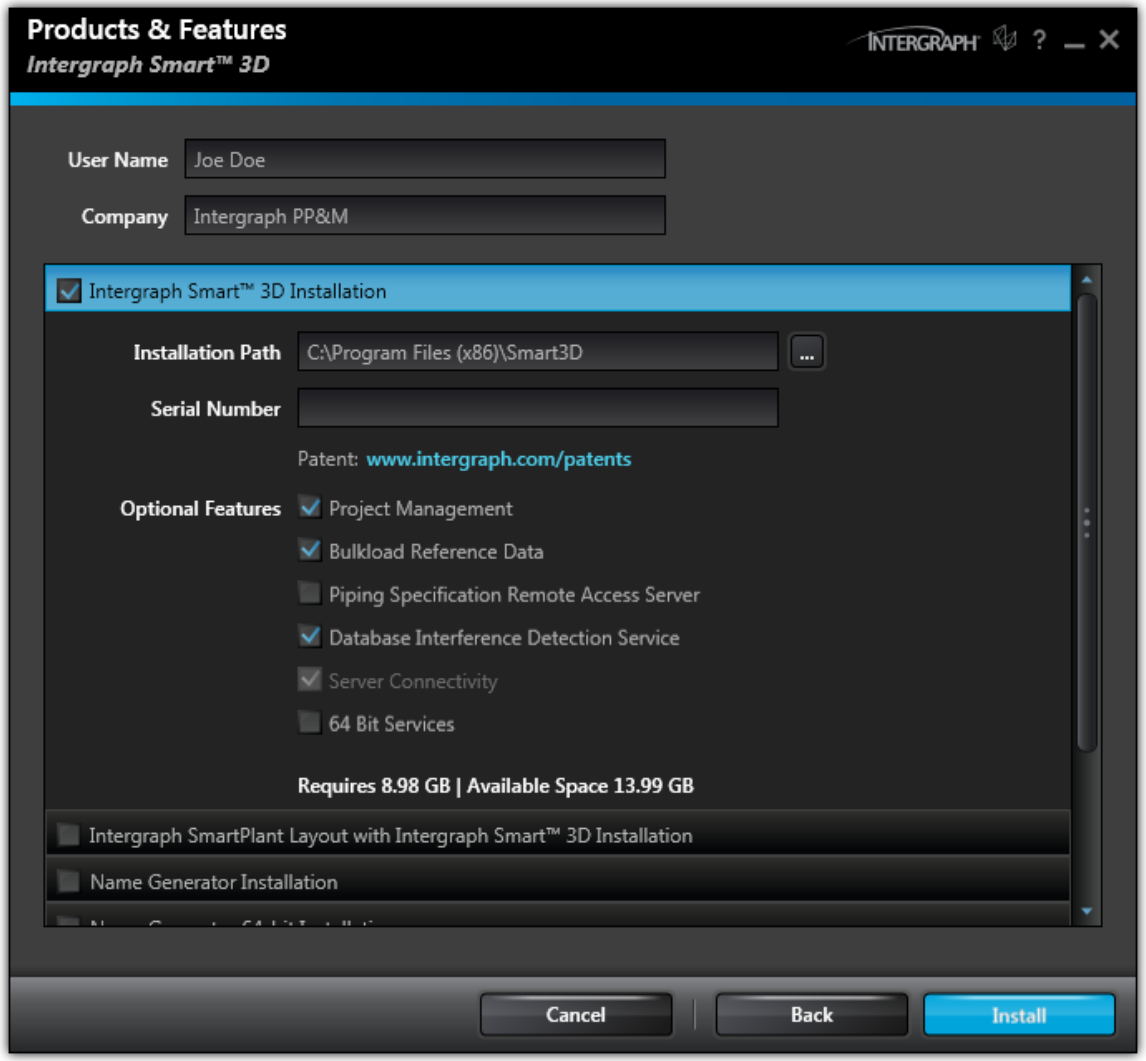


Workstation Installation (Design and/or Admin Client)

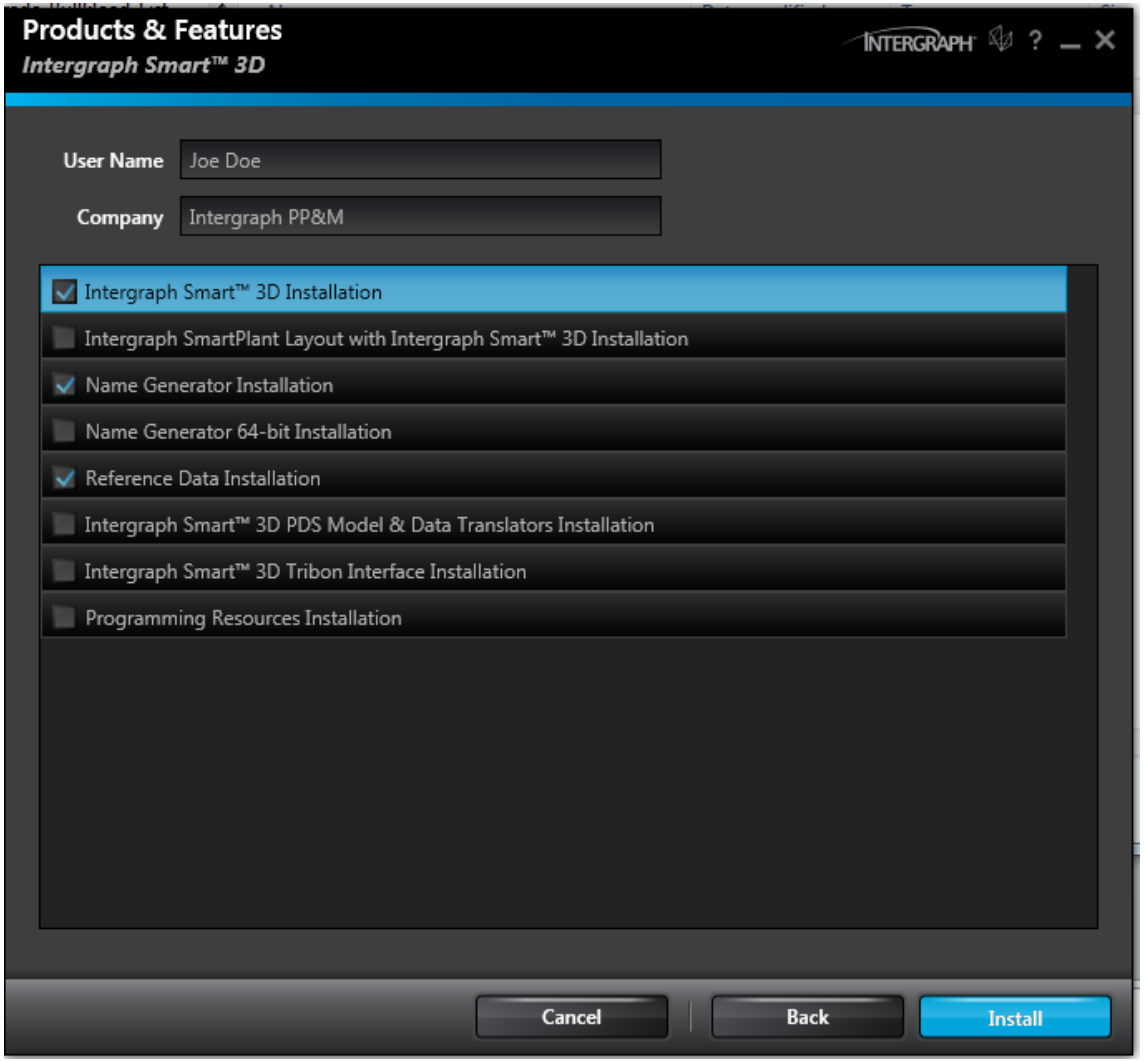
System Setup: Installation of Smart 3D Design Client Installation



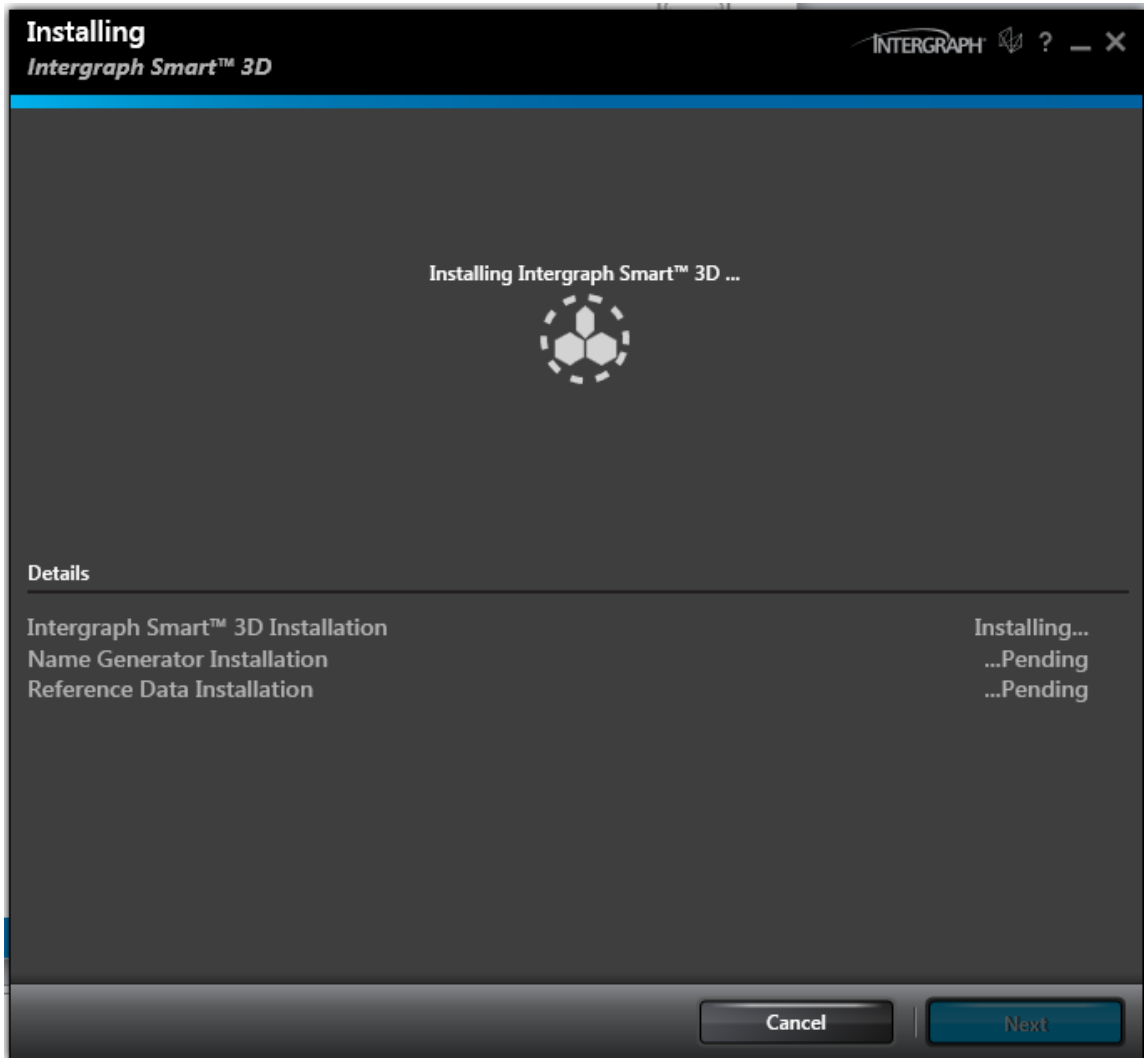
System Setup: Installation of Smart 3D Design /Admin Client Installation



System Setup: Installation of Smart 3D
Full Installation



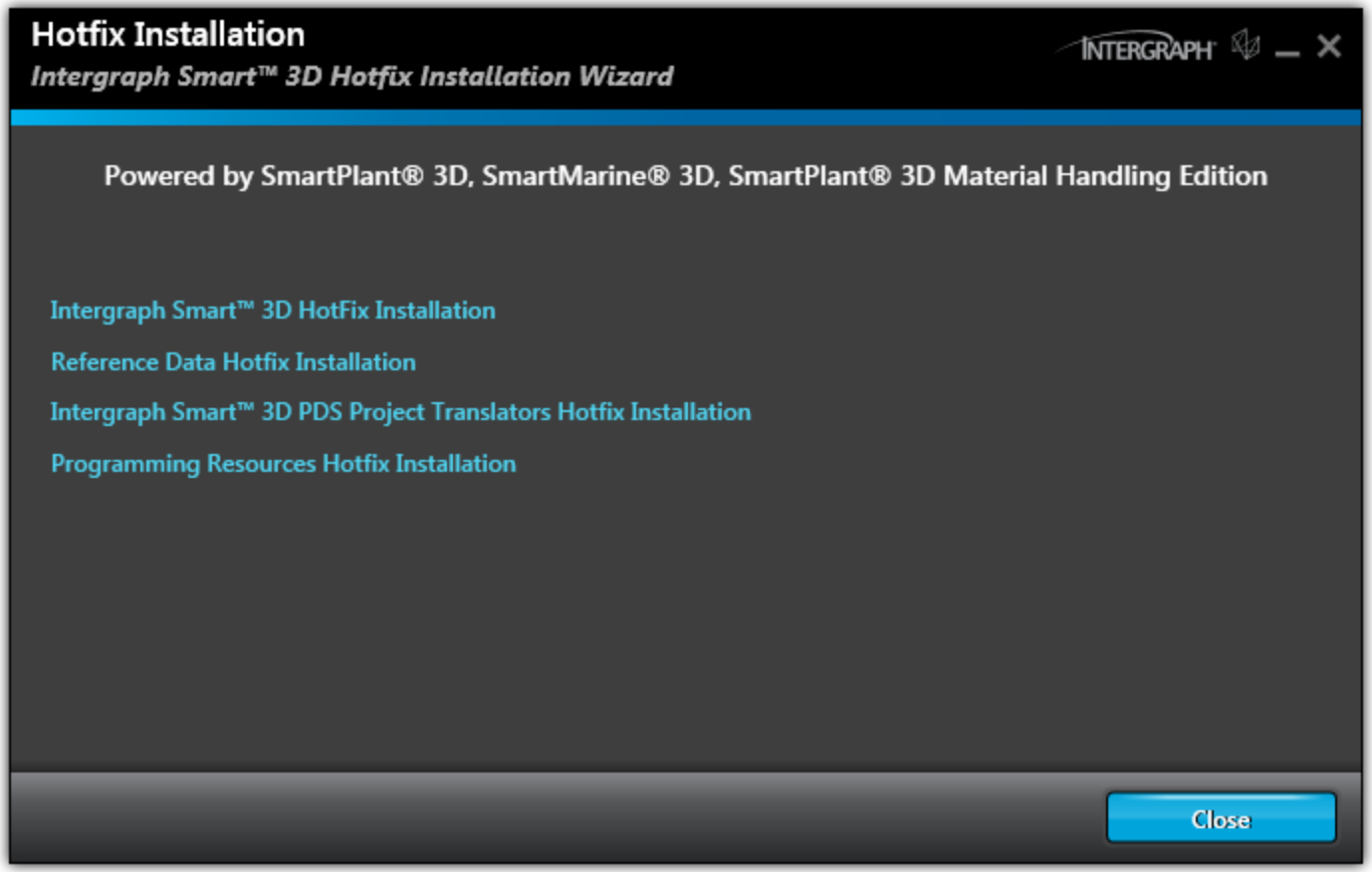
System Setup: Installation of Smart 3D
Full Installation



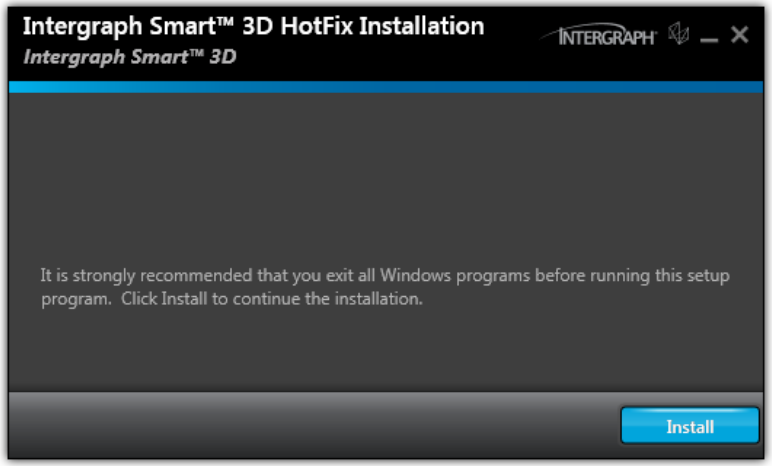
Smart 3D Setup: HotFix installation

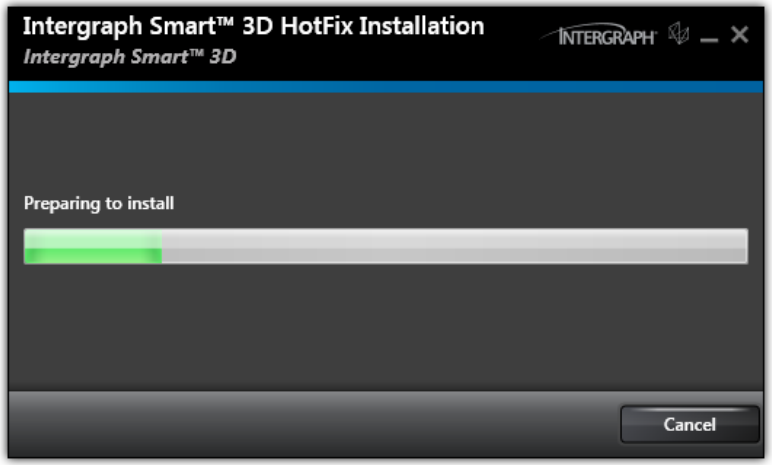
- Installed through a GUI with similar options to base installation.
- Can be installed silently with a script
- HotFixes are listed as updates to Smart 3D in the list of programs.

Smart 3D Setup: HotFix installation



Smart 3D Setup: HotFix installation





Smart 3D Setup: Configurations

- **Final Configurations for a Workstation**

  - Verify firewall is either turned off or set proper exceptions
  - Register SQL Server on administrative computers or configure the Oracle Net service

Smart 3D Setup: Configurations

- **Final Configurations for a Reference Data server**
  - Share to the network and adjust proper permissions on the Shared Content folder.

- **Final Configurations for a Name Generator server**
  - Set proper exceptions in the Windows Firewall to allow inbound requests on port 135 and the range of dynamic RPC ports
  - Add all Smart 3D users to the “Distributed COM Users group” local group

SETUP AND ADMINISTRATION LAB

Lab 1

PROJECT SETUP

Project Setup: Hardware sizing recommendations

- Hardware sizing, especially for servers, depends on many factors such as:

- The number of concurrent users per server
- The number of locations (Global Workshare)
- The size of the project (which translates into the size of the databases)
- Other software that is running on the machine

Project Setup: Hardware sizing recommendations

- The users per server that define the different project sizes (small, medium, and large) need to be taken as an effective number. The effective number of users should be calculated by taking into consideration the following:

- Drawing Batch server - add 3 users
- Remote IFC - add 1 user
- Global Workshare Setup - For each server add 25% of the total concurrent users of all the other servers.

Ef = Cu + (0.25 * (Ct))

Where:

Ef = effective concurrent users for one server

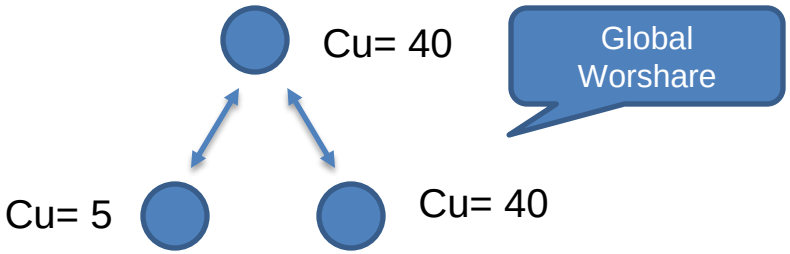
Cu = concurrent users for this server

Ct = total concurrent users for all other servers

Project Setup: Hardware sizing recommendations

Example:

- In a Global Workshare project with 3 servers (locations), 40 users will connect to two servers, and 5 users will connect to one server:



Ef = Cu + (0.25 (Ct))

When all 3 servers are working concurrently, the equivalent number of users at each server is:

The equivalent number of users at each one of the 40-user servers are:

40 + (0.25 * (45)) = 51.25 users

The equivalent number of users at the 5-user server is:

5 + (0.25 * (80)) = 25 users.

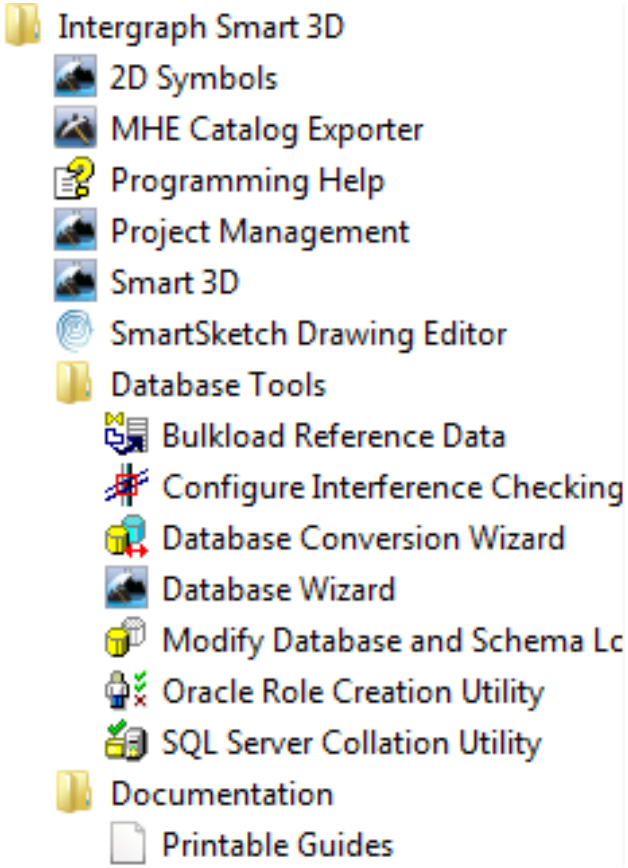
Project Setup: Hardware sizing recommendations

Project Size	Effective users on one server	Model database size	IFC Server	Batch Server
Small project	1 to 15	Up to 5 GB	Separate server or workstation	Separate server or workstation
Medium project	16 to 50	6 – 20 GB	Separate server or workstation	One or more separate server or workstation
Large project	51 to 100	20 GB or more	Separate server or workstation	Multiple separate servers or workstation

Project Setup: Hardware sizing recommendations

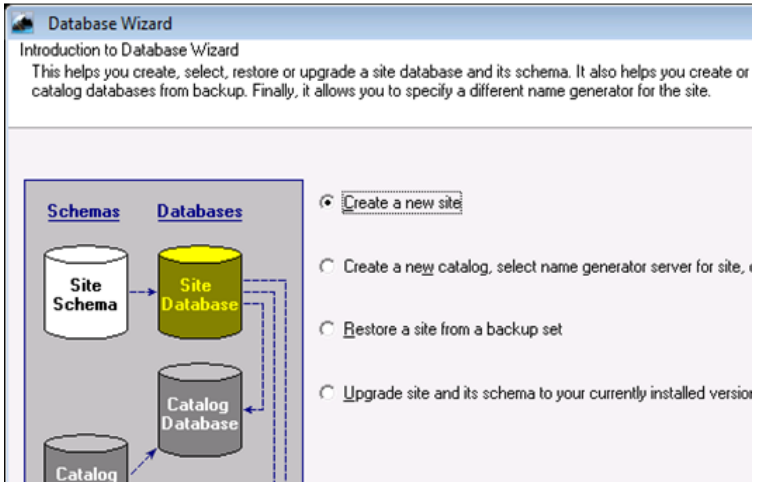
Project Size	Small	Medium	Large
Number of processor cores (one Core 2 Duo counts as two)	4	8	4 – 8 or more
Memory for SQL Server 2008 and Oracle 11g	16 GB	32 GB	64+ GB
Bus Size, OS, and Database	64 bit	64 bit	64 bit

Project Setup: Familiarize with the software

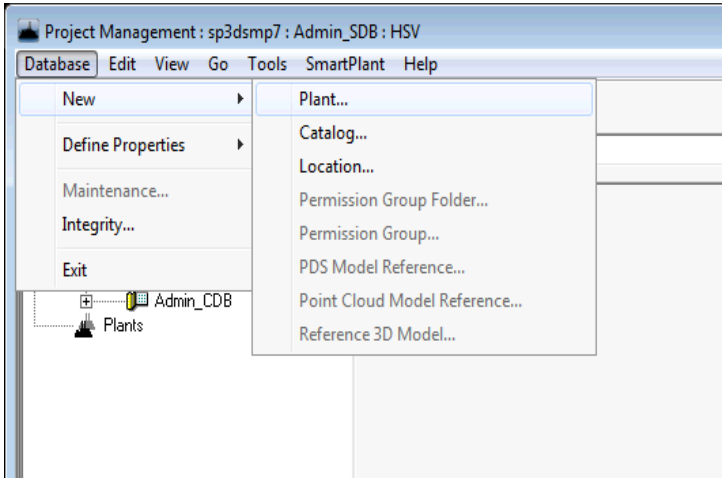


Project Setup: Database creation

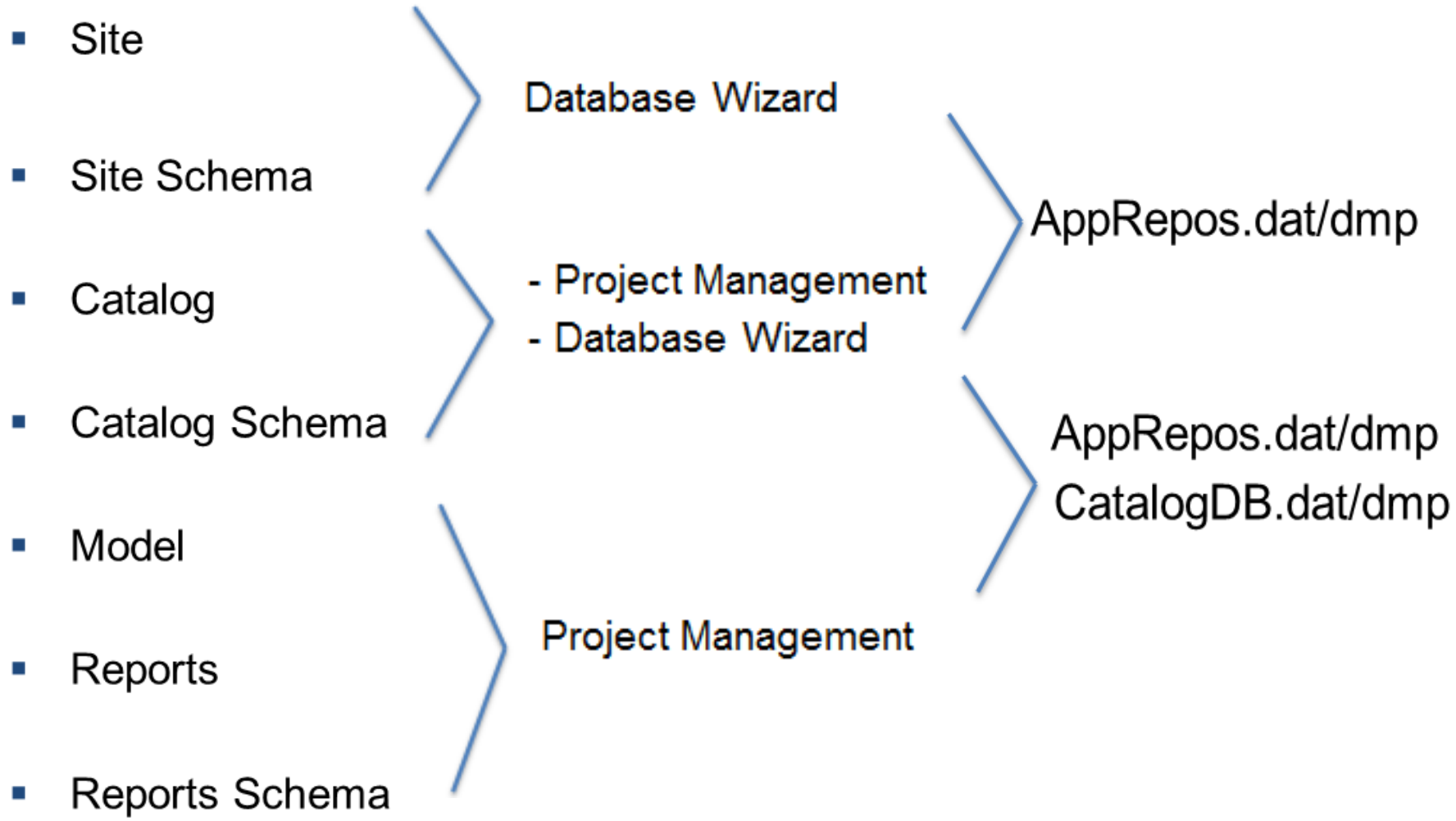
- **Site and Catalog database creation**
  - Database Wizard



- **Plant creation**
  - Project Management



Project Setup: Create a plant from scratch

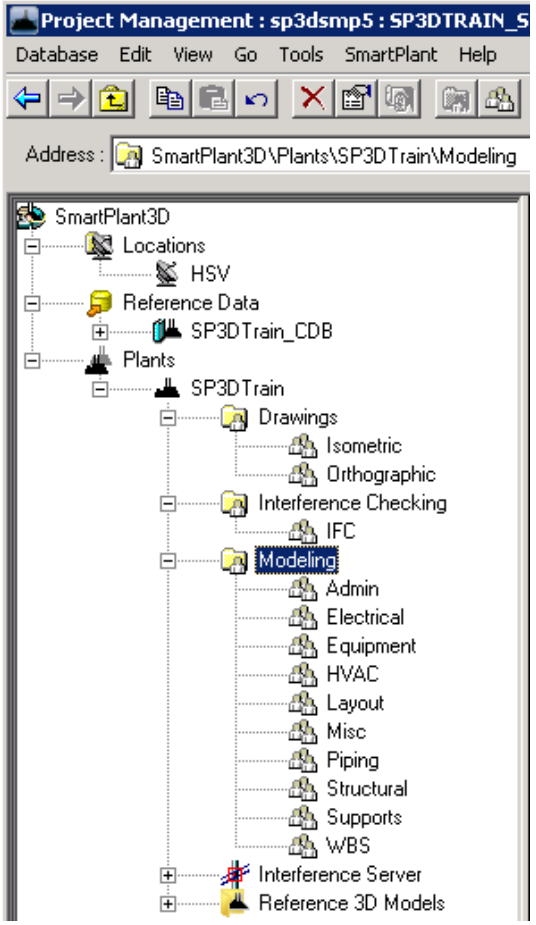


SETUP AND ADMINISTRATION LAB

Lab 2

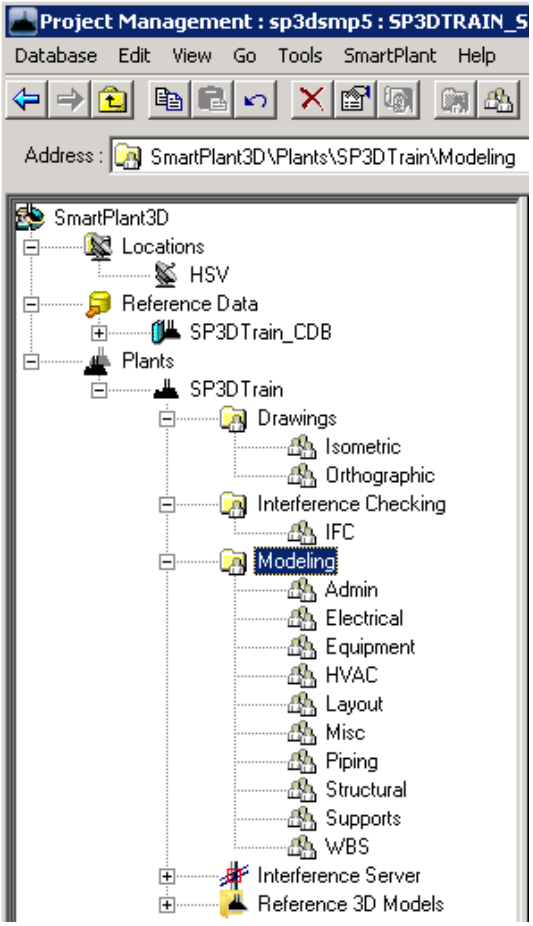
Project Setup: Permissions hierarchy

- Plant/Catalog root
  - Top level item in the hierarchy
- Permission Group Folder
  - A set used to organize permission groups
- Permission Group
  - Portion of plant/catalog over which various people have various levels of access and responsibility

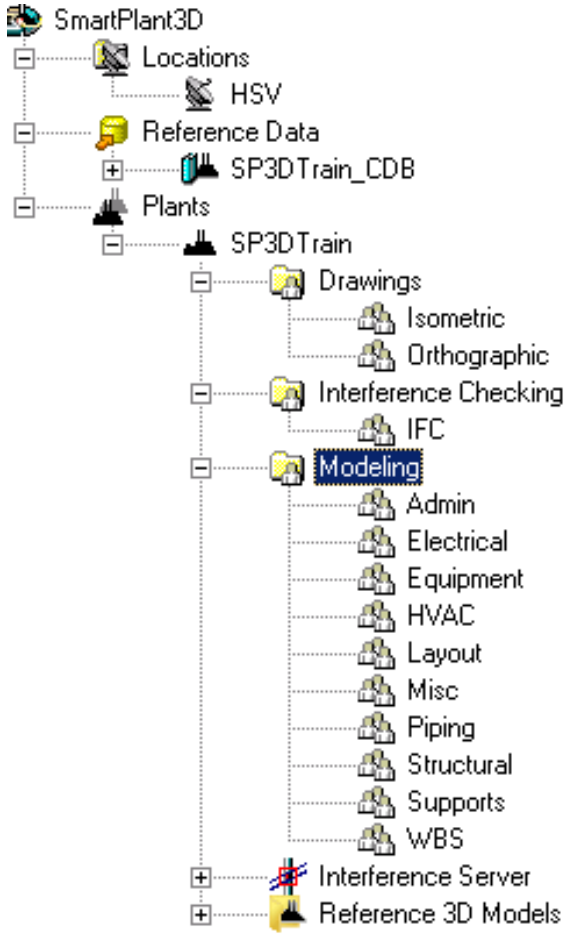


Project Setup: Permissions hierarchy

- This hierarchy is seen only in Project Management
- Can have unlimited number of levels of folders
- Cannot have permission groups and permission group folders at the same level
- Permission Groups are the last leaf in a branch
- Copy/Paste permission groups available



Project Setup: Sample Permission Objects hierarchy

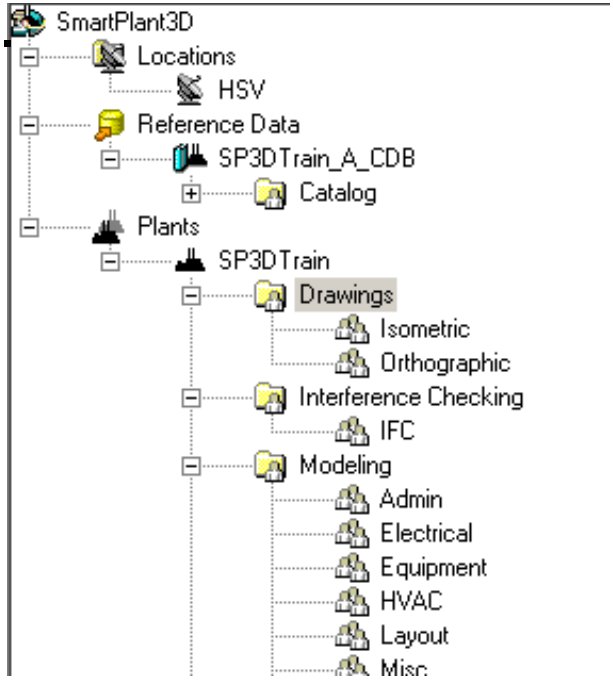


Project Setup: Modify Permission Objects hierarchy

- Rename command
- Folders cannot be deleted if there are Permission Groups under them
- Permission Groups containing objects cannot be deleted
- Copy/Paste of Permission Groups and Folders copies just the Permission Objects, not model items contained within. Name has to be unique within container (Catalog or Plant).
- Move command allow to relocate Permission Objects within Container

Project Setup: Root vs Permission Group assignment

- Permissions can be granted for Windows Security Object (Groups and/or Users) at the Plant/Catalog Root and Permission Group level
- Permissions granted at Plant/Catalog Root level allow access to modify permissions hierarchy within the plant and perform various administrative tasks.
- Permissions granted at Permission Group level affect access to objects within that permission group. These are used for general modeling purposes.

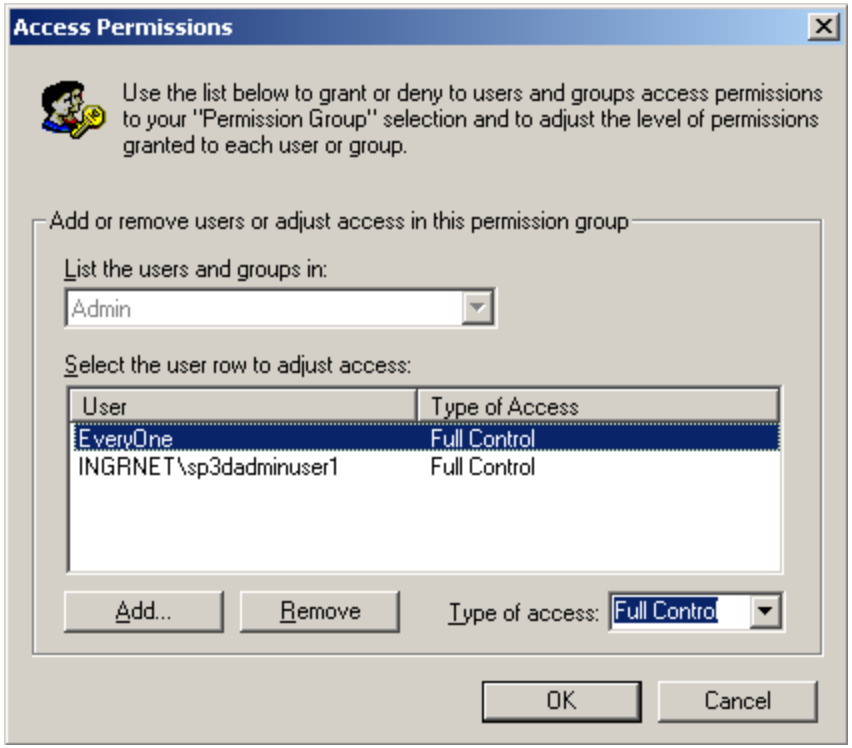


Project Setup: Association concept

- When objects are placed, they will be automatically assigned to a permission group.
- Objects can be associated to systems belonging to permission group where user has access
- Objects can only be modified or deleted if user has access to permission group assigned to the object.
- You can associate objects to those Work Breakdown Structure (WBS) items to which you have access based on the permission group they belong to.

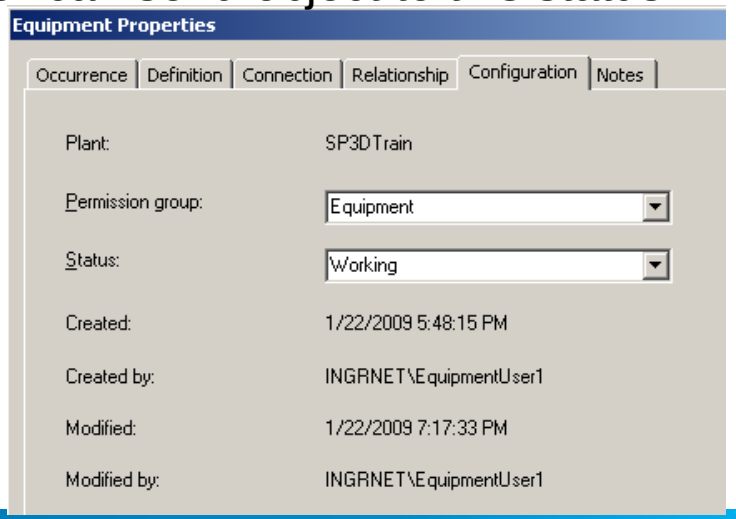
Project Setup: Permission access levels

- **Read** = view objects
- **Write** = create/modify/delete objects
- **Full Control** = create/modify/delete + approve or reject objects



Project Setup: Object status

- **Working**
  - Initial status of all objects; Objects can be edited/deleted while in this status
- **In Review**
  - Object is in read-only mode and waiting for approval/rejection
- **Rejected**
  - If an object is found to be incorrect, reviewer can send object to this status
- **Approved**
  - If an object is found to be correct, reviewer can send object to this status



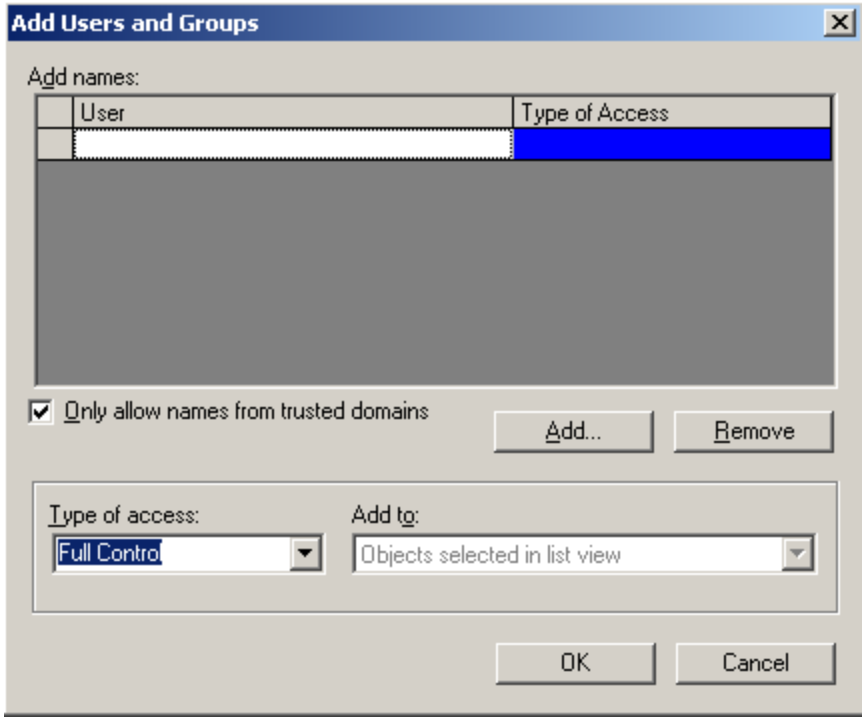
Project Setup: Status change based on permissions

- **Read**
  - can’t change status
- **Write**
  - can change from Working to InReview
  - can change from InReview to Working
  - can change from Rejected to Working
- **Full Control**
  - can change from any status to any status

Project Setup: Permissions logical model

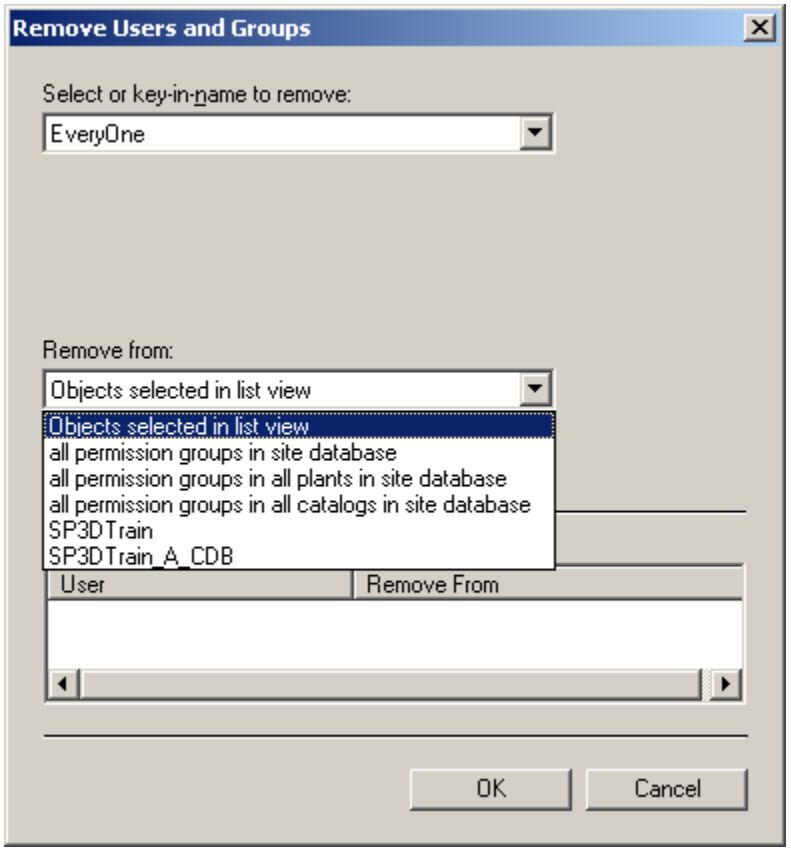
	View	Create/Modify/ Delete	Send to review/ bring back	Approve/ reject
Read	√			
Write	√	√	√	
Full Control	√	√	√	√

Project Setup: Add users to permission groups



Project Setup: Remove users from permission groups

- Select the users to be removed
- Pick the places they need to be removed from



SETUP AND ADMINISTRATION LAB

Lab 3

BACKUP AND RESTORE

Backup and Restore: Overview

Backup

- Project Management Backup
- Manual backup of the Shared Content folder

Restore options

- Restore one or more plant databases from backup
- Restore plant for selective recovery of model objects
- Restore plant as a copy

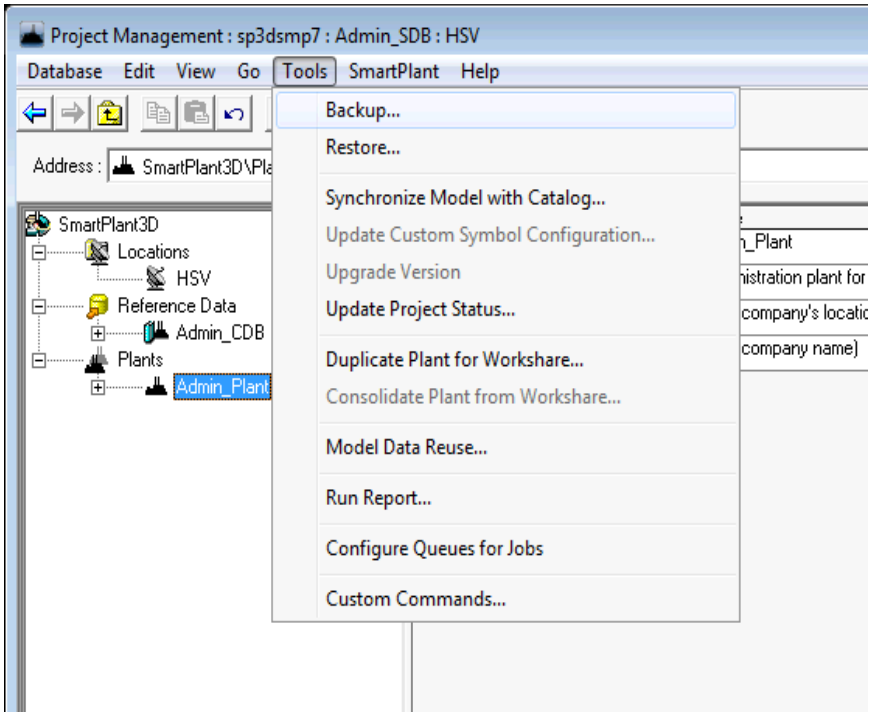
Backup and Restore: Project Management Backup

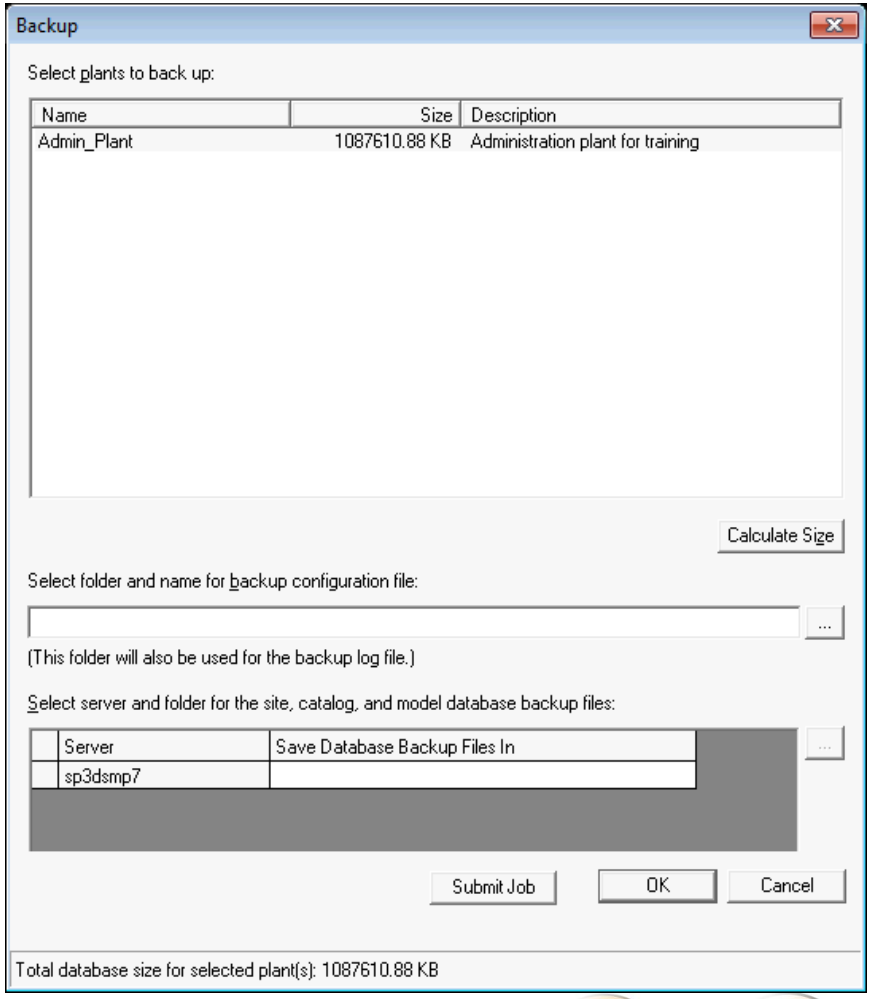
- Model Catalog and Site databases are backed up, reports databases are excluded.
- A backup configuration file (bcf) containing information about the backup set is created in the location specified for the backup
- Backup files will be saved to database server by default
- Backups may be saved to a network location, additional configurations are required for this

Backup and Restore: Project Management Backup

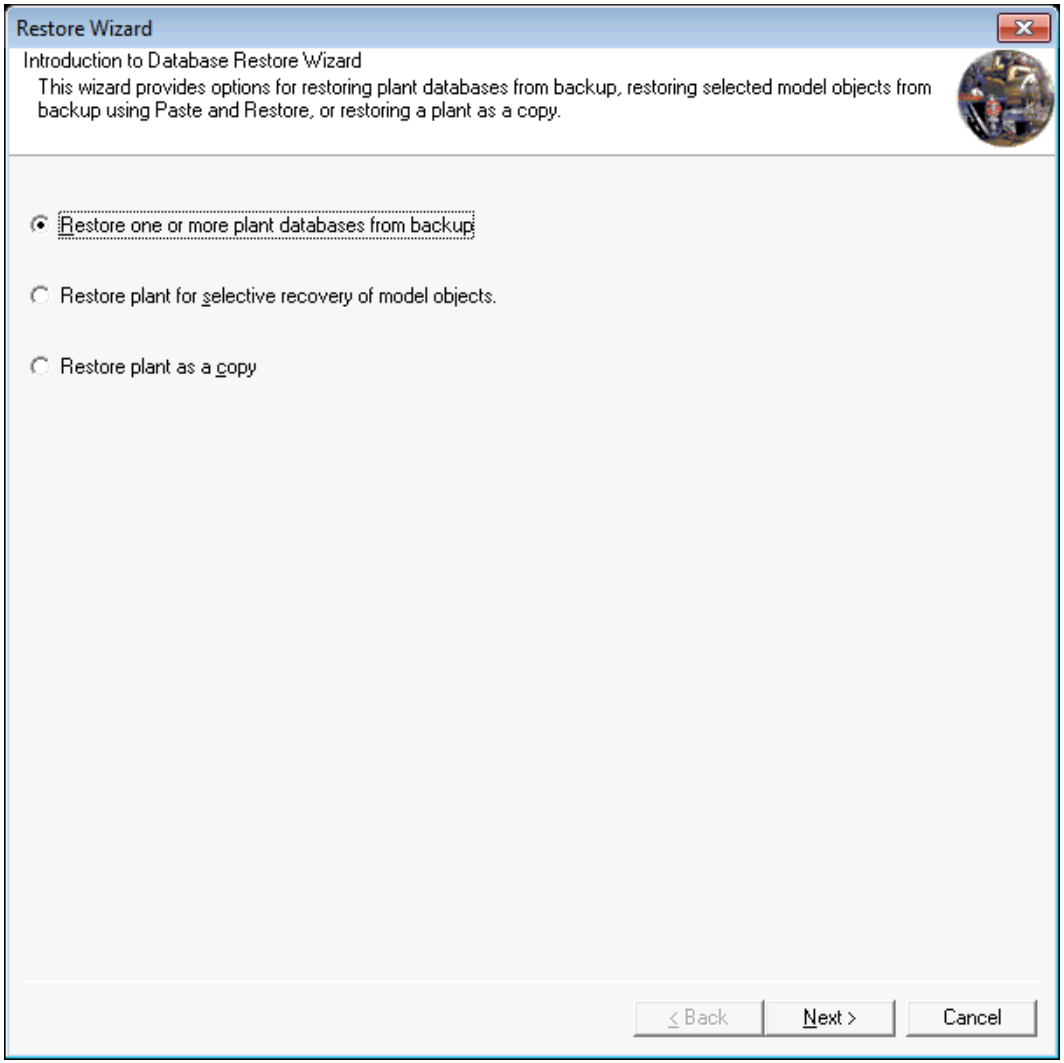
- There are no individual files to be backed up – only complete databases
- To complete the backup set, user needs to manually backup the Shared Content folder for the plant
- Multi-plant backup available
- User running the backup as well as account used as logon for Oracle Windows NT Service need to have write permissions on the folder under which backup files will be created.

Backup and Restore: Project Management Backup





Backup and Restore: Restore options



Backup and Restore: Restore one or more plant databases from backup

- Restores previously backed up plants overwriting the existing one.
- You can only restore a complete plant (no partial restore)
- Catalog can be overwritten or not depending on user selection to prompts
- Items that were manually backed up (Shared Content folder) need to be manually restored as well

Backup and Restore: Restore plant for selective recovery of model objects

- Restores a plant from a previous backup, without overwriting the existing plant.
- Allows for selective recovery of objects from previous versions of the same Plant without losing object identity or relationships
- The restored project will exist in the Site database in parallel to the current project and would share the same catalog.

Backup and Restore: Restore plant as a copy

- Allows the restore of plants that were backed up from a different site database.
- Allows to create a replica but independent plant from the production plant backup (test plants).
- Ability to change the name of the plant and the restored model and catalog databases.
- When the selected plant to restore is registered with SmartPlant Foundation, the registration is removed from the copy during the restore.

Backup and Restore: Off-site Restore

- May be used to restore entire project on a new location, it can be due to a change in database servers, or to restore a backup received from a third party company.

  - Using database wizard, restore site from backup set

  - Using project management, restore plant from backup (this brings in catalog associated with the plant)

  - Regenerate report databases

  - Manually copy all the Shared Content files and outputs to the remote site

  - Custom symbol dlls need to be registered on each client workstation at the remote site if required

Project Management: Delete a Plant

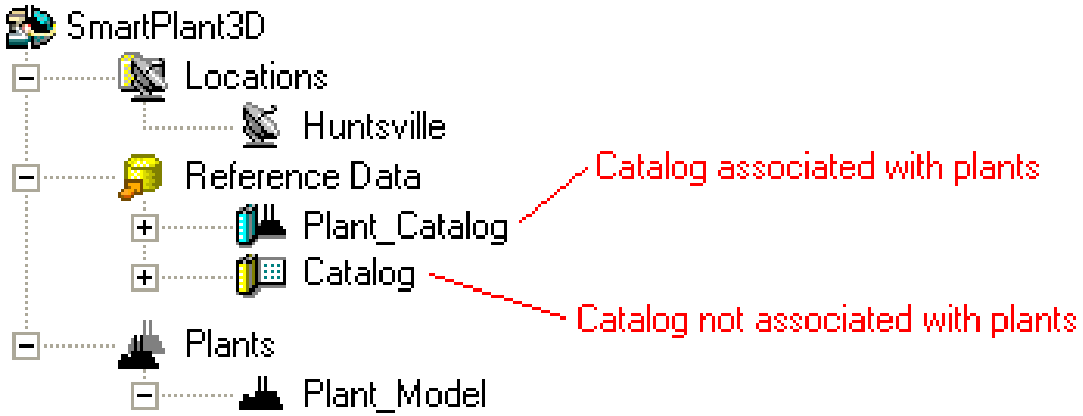
- Full Control permission at the root level.
- Option to drop or leave the physical database files in place.
- For plants in Oracle, the software may not delete all of the associated database objects. To delete schema information after deleting an Oracle plant, you must use the **Oracle Database Tools Wizard for Smart 3D** located at [*Product Directory*]\ProjectMgmt\Tools\Bin\SP3DOracleDBToolsWizard.exe.

SETUP AND ADMINISTRATION LAB

Lab 4 – 7

Project Management: Delete a Catalog

- Catalogs can only be deleted if they are not associated with any plant.
- In Oracle servers, Catalog must also be deleted using the **Oracle Database Tools Wizard for Smart 3D**



Project Management: Hierarchy Icons

 - Top level of the hierarchy

 - Reference data

 - Catalog associated with a plant

 - Catalog associated with a plant. Missing database

 - Catalog associated with a plant. Needs to be upgraded

 - Catalog not associated with a plant

 - Catalog not associated with a plant. Missing database

 - Catalog not associated with a plant. Needs to be upgraded

 - Plant

 - Plant. Missing database

 - Plant. Needs to be upgraded

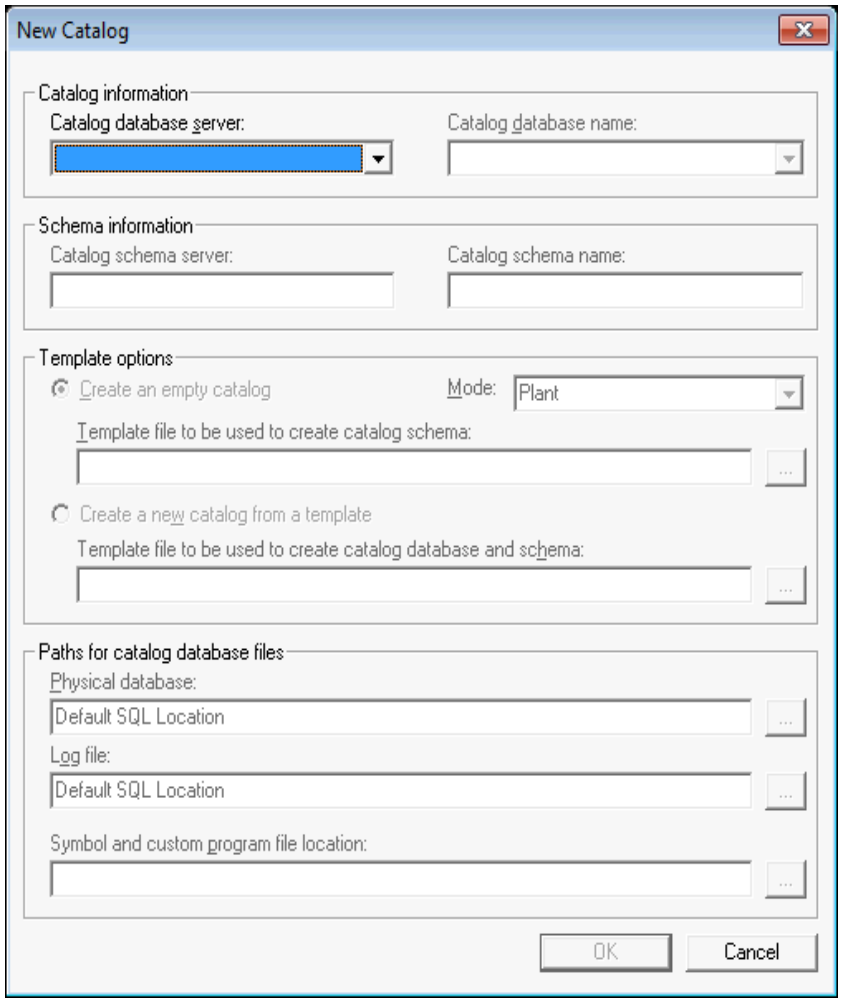
 - Permission group folder

 - Permission group

Project Management: New Catalog Command

- Create a new empty catalog or create a catalog from a template.
- Default permission groups and access rules are created.
- In a Global Workshare configuration, the **Database > New > Catalog** command is available at the Host location, but not at the Satellite locations.
- Every catalog must be associated to a Shared Content folder

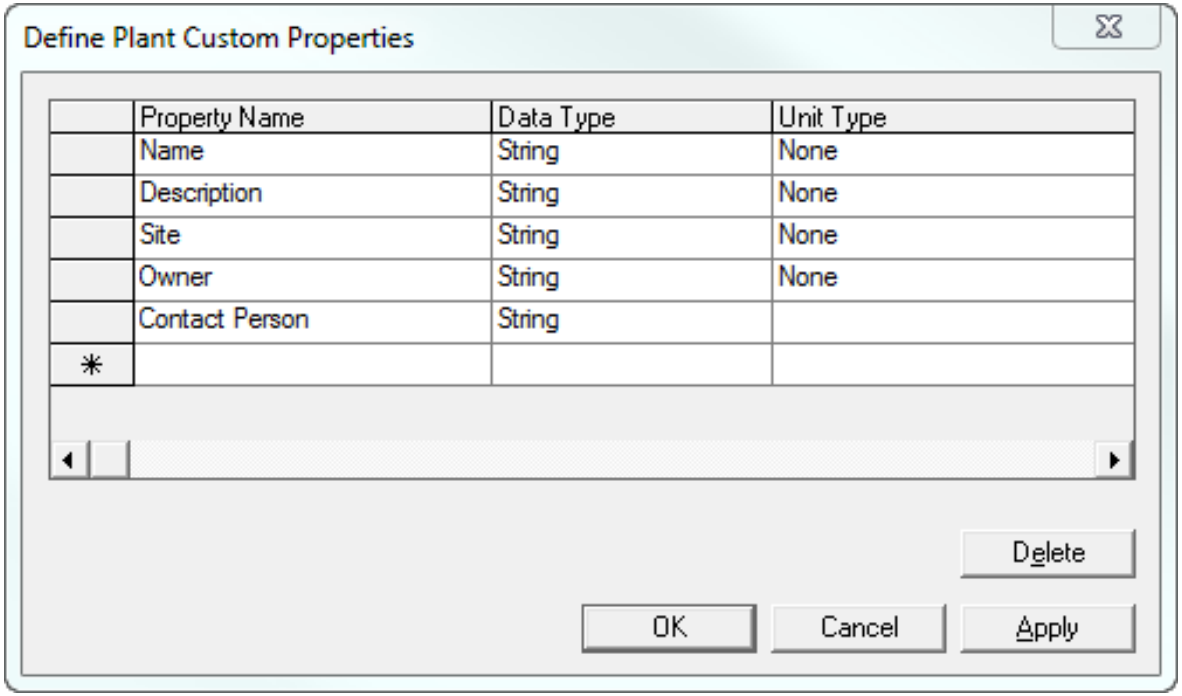
Project Management: New Catalog Command



Custom Properties: Define Property Schema

- Additional properties for plants, permission group folders and permission groups can be added
- Properties can be viewed in project management environment but are also reportable
- Property information for plants is stored in the site database to which they belong
- Property information for permission folders and permission groups is stored in the plant to which they belong

Custom Properties: Define plant property



SETUP AND ADMINISTRATION LAB

Lab 8 – 10

PLANT ORGANIZATION (SYSTEMS)

Systems and Specs: Contents

- System hierarchy
- Create and modify Systems hierarchy
- Assign allowed specifications

Systems and Specs: Systems overview

- A system is a container that group objects logically
- Systems have other systems as children creating a hierarchy with unlimited levels
- Subsystems can belong to a different permission group from their parent
- Many different types of systems are supplied (discipline specific and generic)
- Every object must belong to a system
- Different types of objects can be associated with different system types

Systems and Specs: System types

- Generic system
- HVAC system
- Equipment system
- Pipeline system
- Unit system

- Conduit system
- Electrical system
- Piping system
- Structural system
- Area system

Systems and Specs: Create and modify Systems hierarchy

- Create new System commands
- Copy and paste of Systems
- Importing from excel

Systems and Specs: Create new System commands

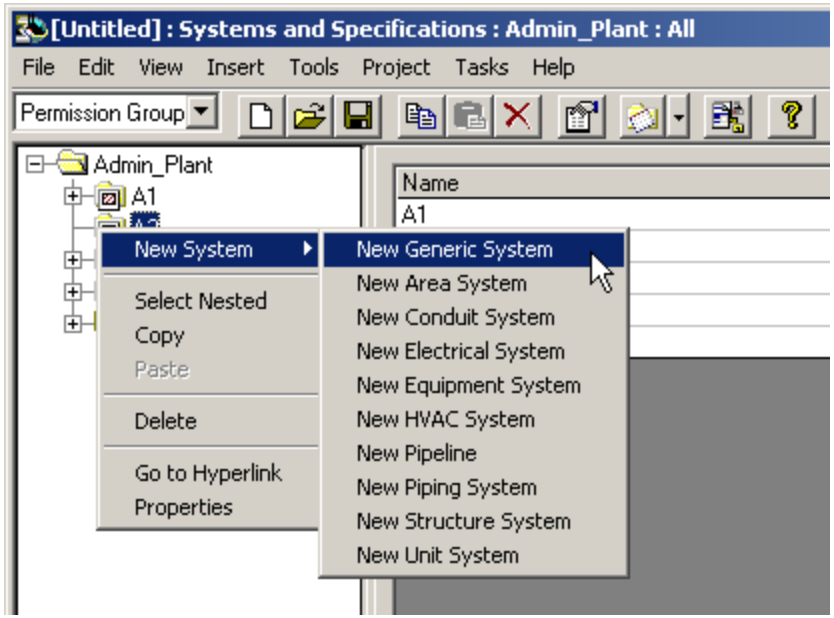
Systems and specifications task – Dedicated function

- Creates a system as a child of the currently selected system
- Currently active name rule for the system type being created is used to generate the name
- If currently active name rule is ‘User-defined’, you can enter the name during creation

Systems and Specs: Create new System commands

Systems and specifications task - Contextual menu

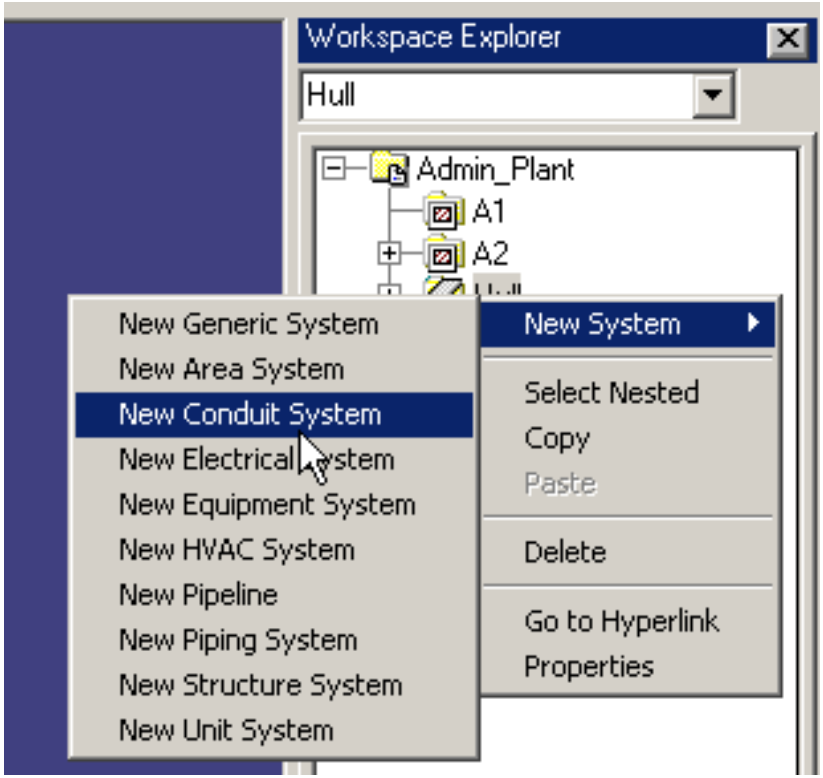
- Systems can be created from workspace explorer hierarchy.



Systems and Specs: Create new System commands

Graphical tasks

- Systems can be created from workspace explorer hierarchy.

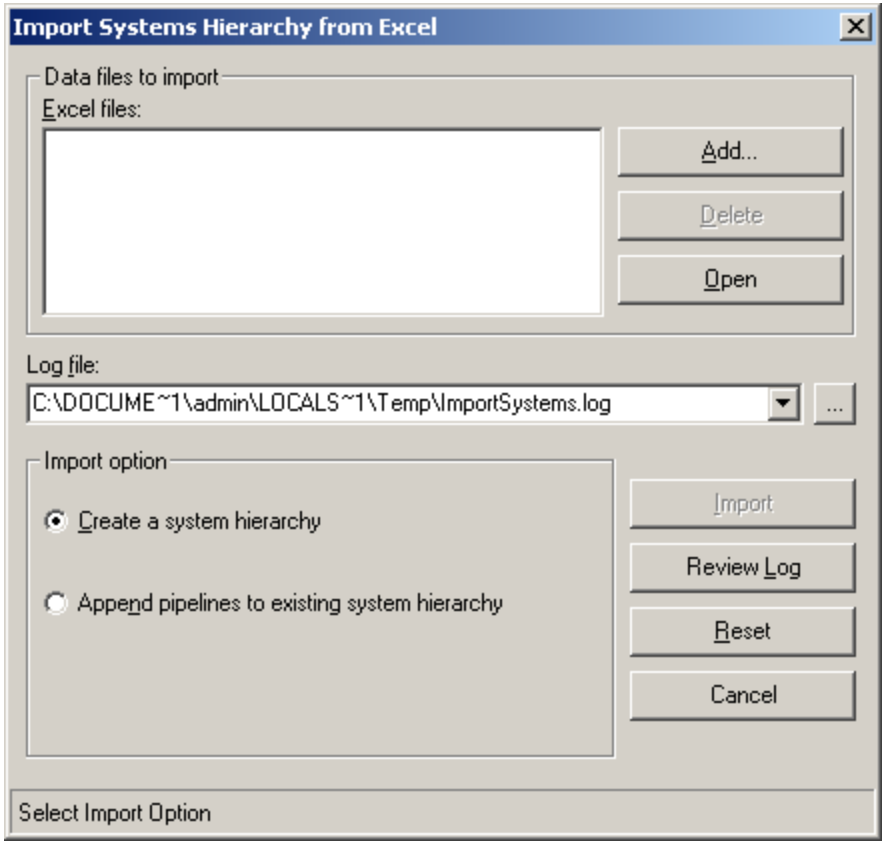


Systems and Specs: Copy and paste of Systems

- Systems can be copied in Systems and Specification task or in the Workspace Explorer
- To select the entire hierarchy under a system, right-click the system then choose option “select nested”
- Paste the hierarchy where desired (paste dialog box may appear)
- You can copy and paste system hierarchies between two plants in that exists in the same site database

Systems and Specs: Importing from excel

- You can create an entire systems hierarchy or add pipelines to an existing hierarchy using a Excel workbook
- Allowed specifications for pipelines can also be set in the workbook.
- If specifications are allowed to pipelines in the workbook, these pipelines will not automatically inherit specifications allowed at parent levels including the root.



Systems and Specs: Editing Systems

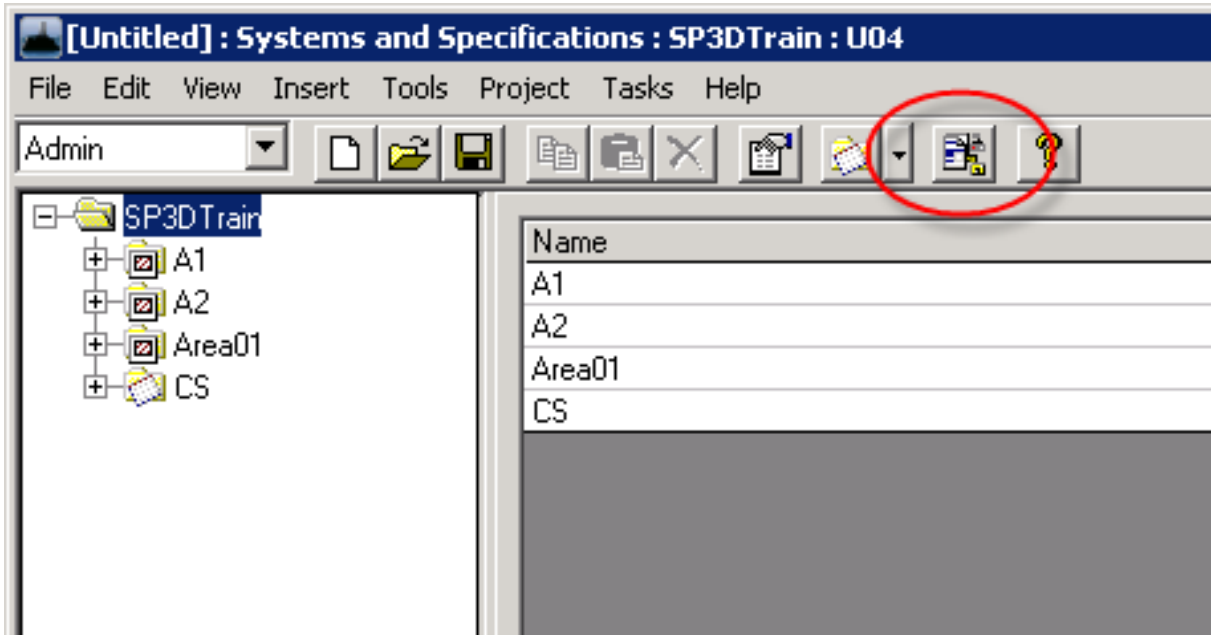
- Deleting Systems
- Renaming Systems
  - User defined
  - Default naming rule
- Moving Systems
  - Move using system's properties page
  - Move using drag and drop in the Systems and Specification task

Systems and Specs: Allow specifications

- Specifications limit part selection and placement based on rules.
- By default, specifications are defined in the Catalog and must first be allowed to the Plant
- All systems inherit the specifications allowed at the Plant root node, unless specifications were allowed from import command.
- Each system must be allowed at least one specification

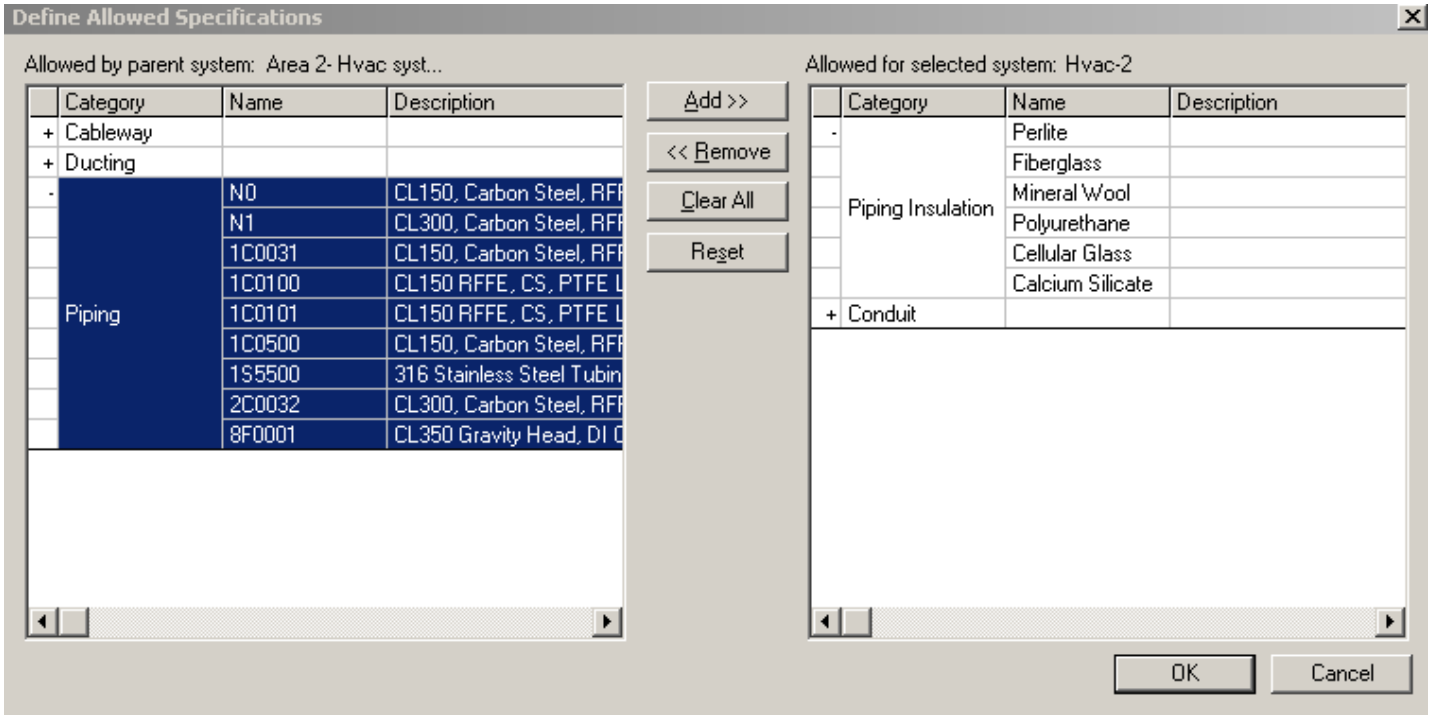
Systems and Specs: Define allowed specifications

- Systems and Specifications task



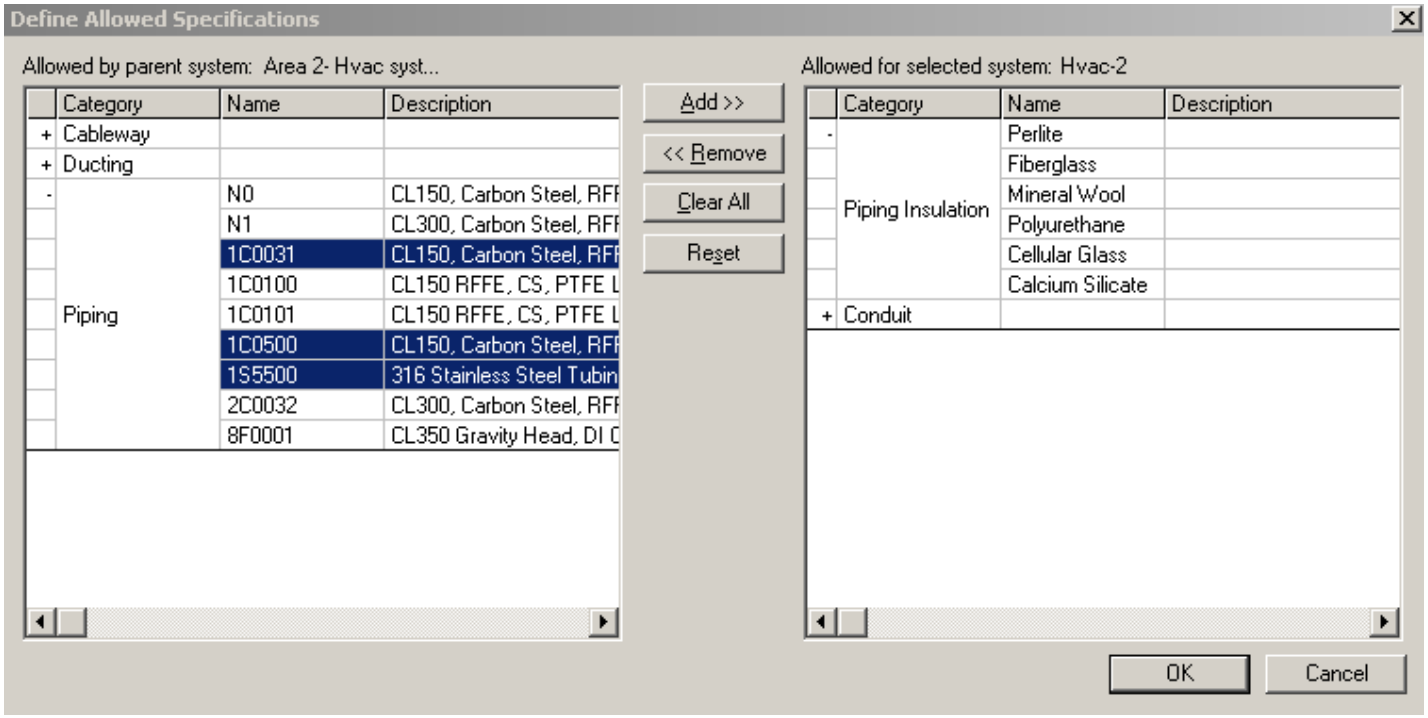
Systems and Specs: Define allowed specifications

Whole categories can be selected with a single click



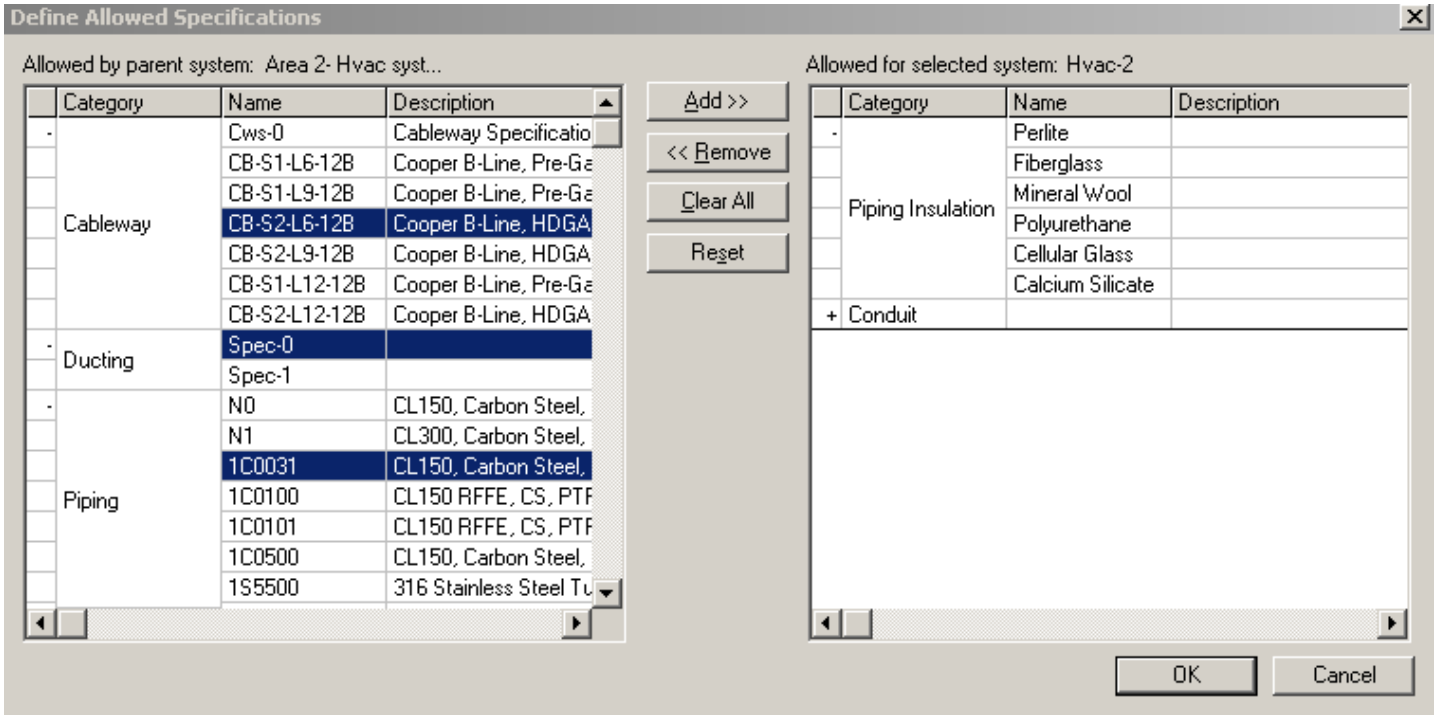
Systems and Specs: Define allowed specifications

Multi-selection of specifications and/or categories



Systems and Specs: Define allowed specifications

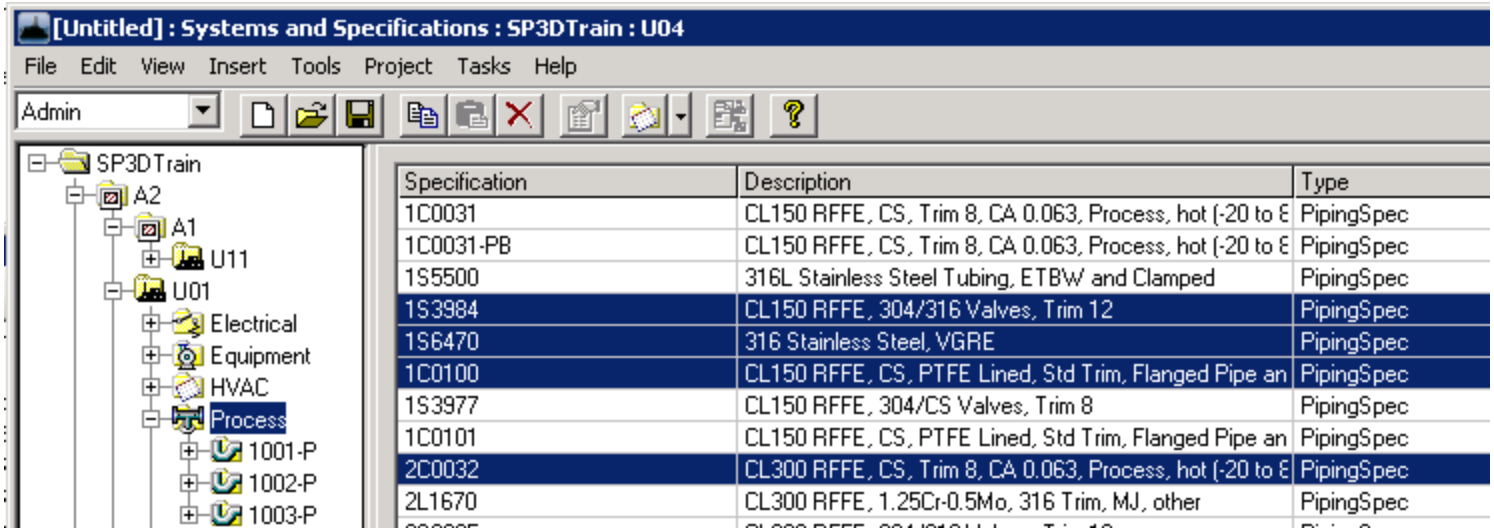
Multi-select of specifications from different categories



Systems and Specs: Define allowed specifications

Easier method to remove allowable specifications from a system

- Switch to the specifications tab while browsing the systems hierarchy
- Multi-select specifications and press delete button from ribbon bar



SETUP AND ADMINISTRATION LAB

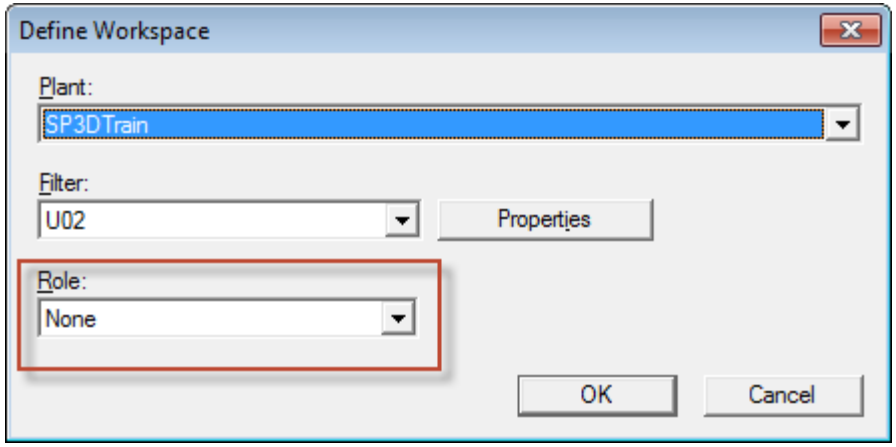
Lab 11 - 13

COMMON APPLICATIONS

OPTIMIZATION FOR ROLES

Optimization for Roles

- Used to refine Workspace definition filter
- Roles are defined in delivered OptimizationforRoles.xml
- Location: \\Server\SharedContent\XML
- Each role is defined with a set of disciplines and subclass object types



DEFAULT COLOR CONFIGURATION

Default Color Configuration – The basics

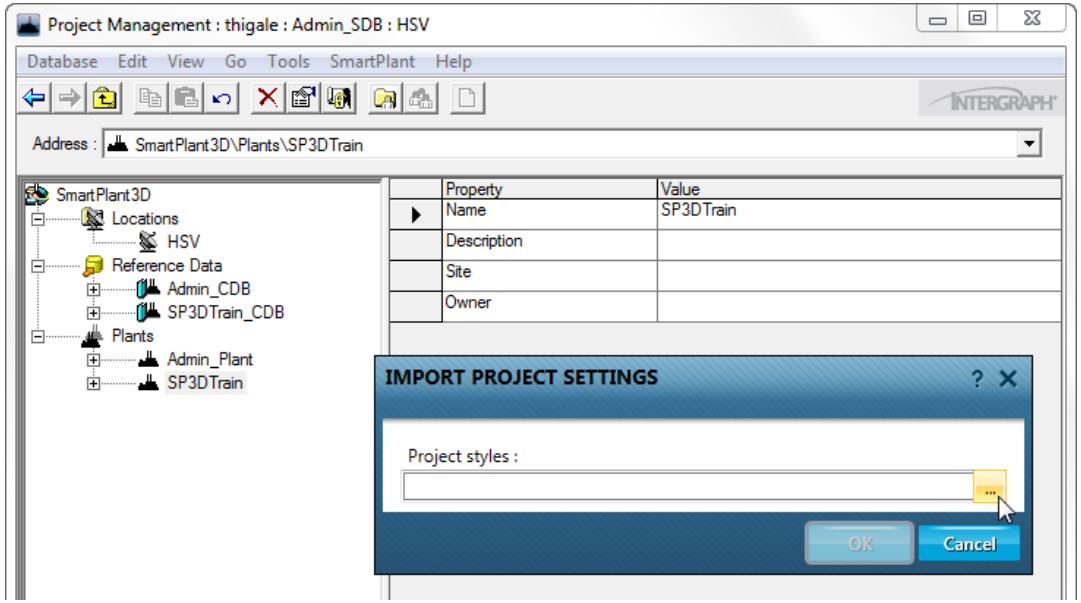
Project Management command

- Import
- Export
- Configure Default Colors
- Apply Default Colors

Default Color Configuration

Import

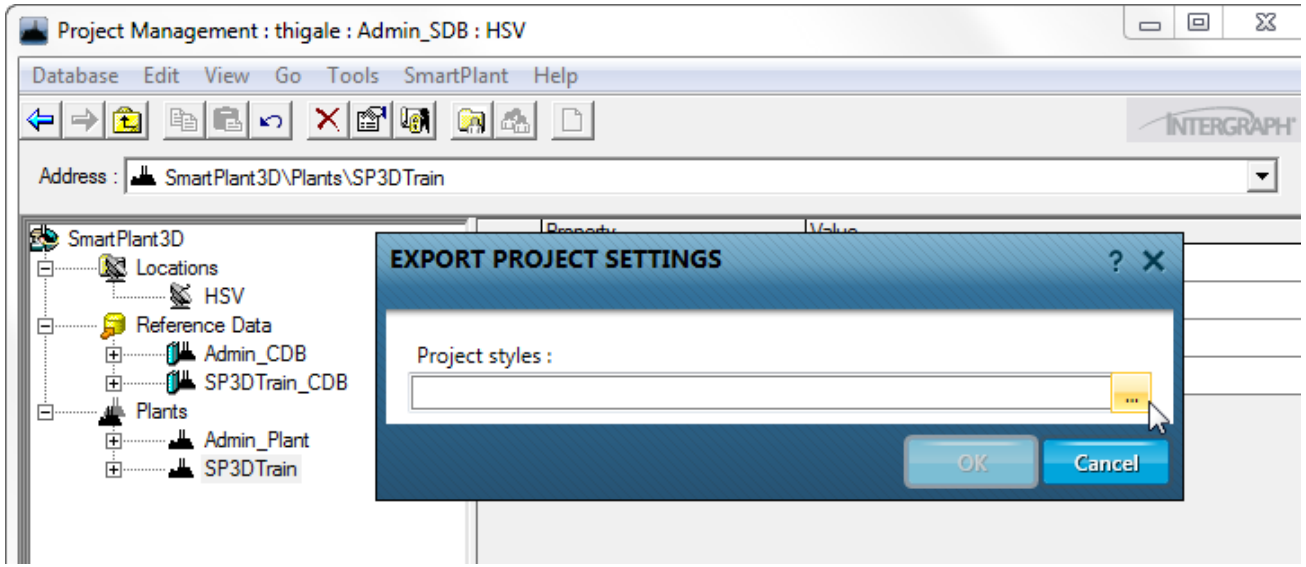
- Aids in importing a set of “Default Style” rules into a model database
- Used for porting rules from one model to another
- Intergraph Defaults are available in SharedContent/XML folder



Default Color Configuration

Export

- Aids in exporting the “Default Style” rules from a model to be ported to another model



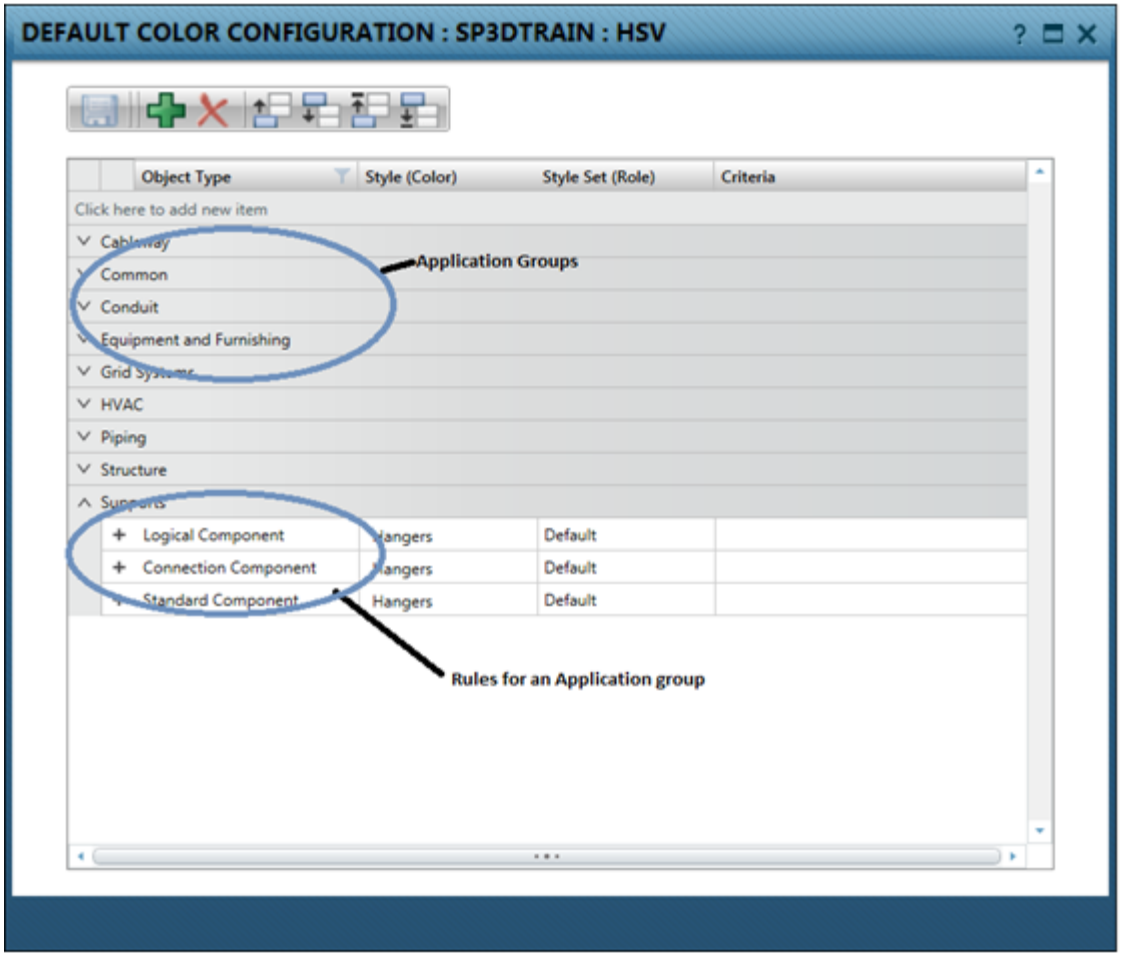
Default Color Configuration

Configure Default Colors

- Styles (colors) are applied per object type
- Rules define the style applied to object types
- Granular level of coloring based on object properties
- Color by Role makes it possible to define different colors for same object type based on role (workspace simplification role) of the person using it.

Default Color Configuration

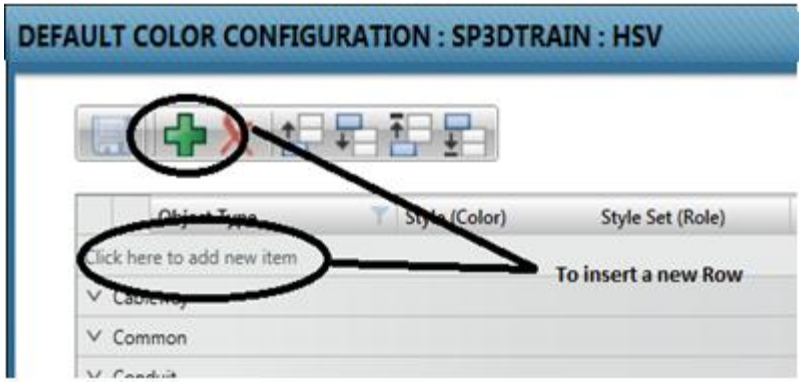
Configure Default Colors



Default Color Configuration

Configure Default Colors

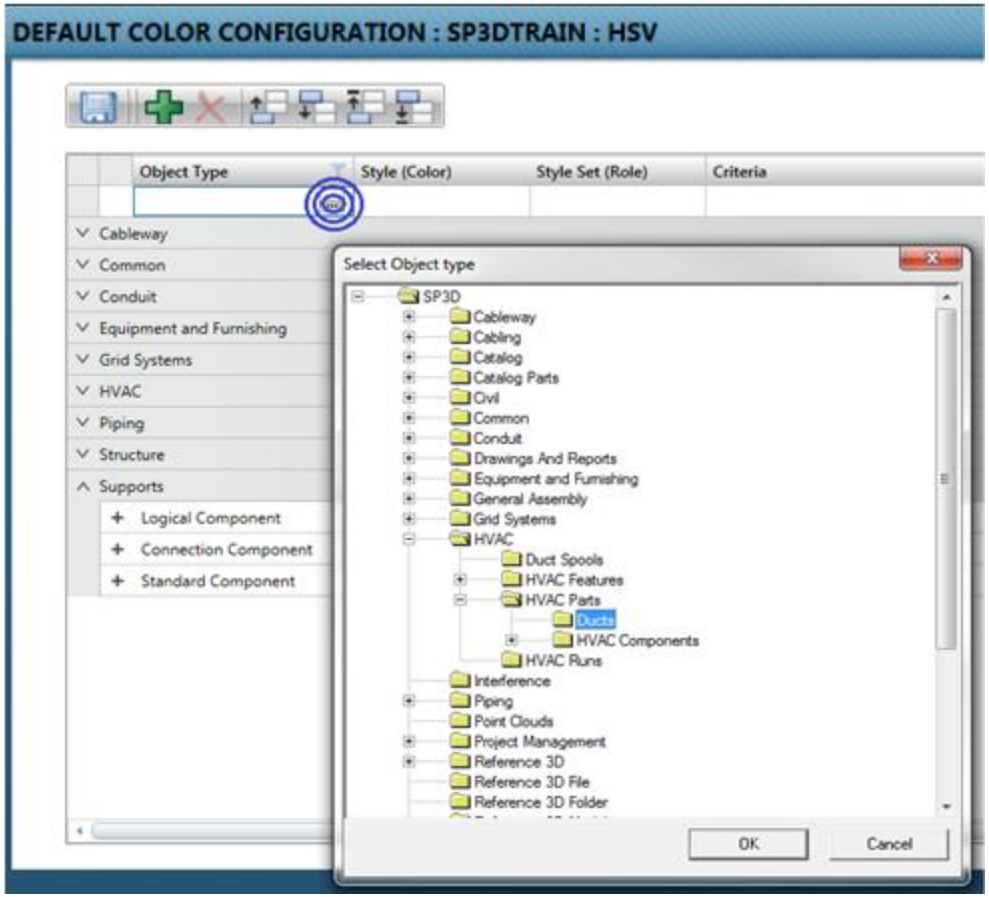
- Create a rule



Default Color Configuration

Configure Default Colors

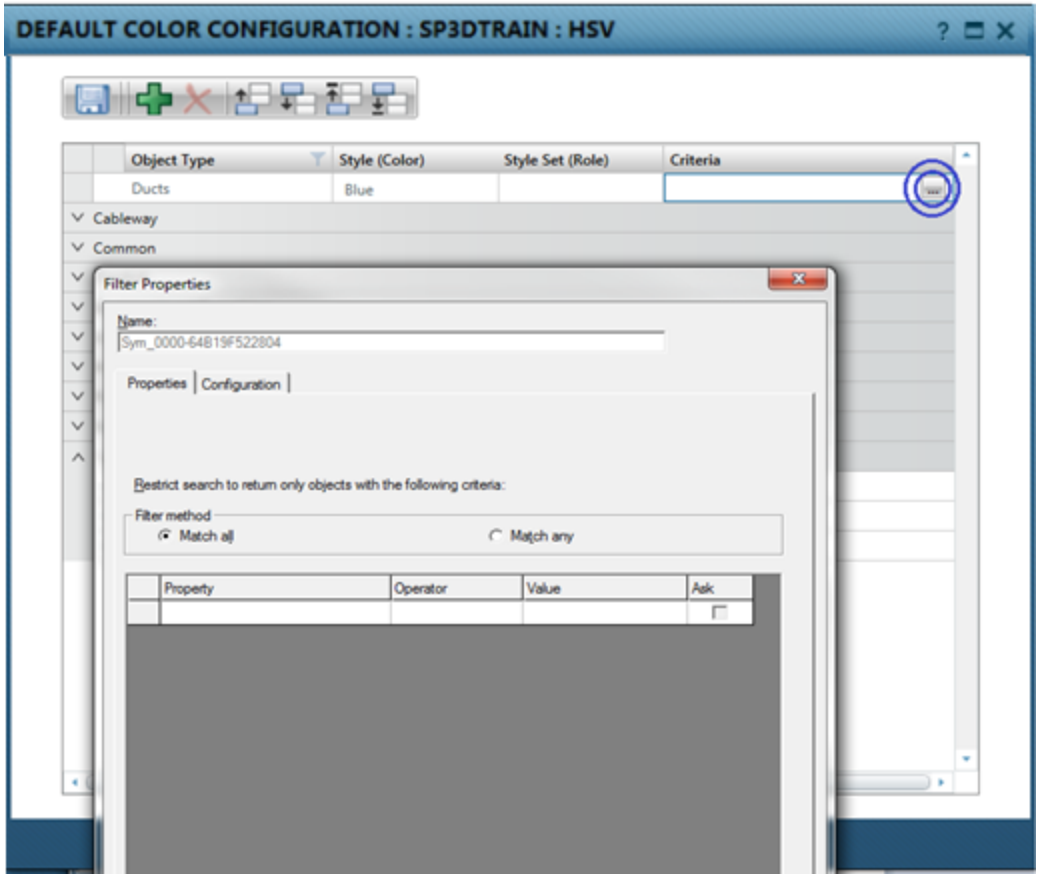
- Create a rule



Default Color Configuration

Configure Default Colors

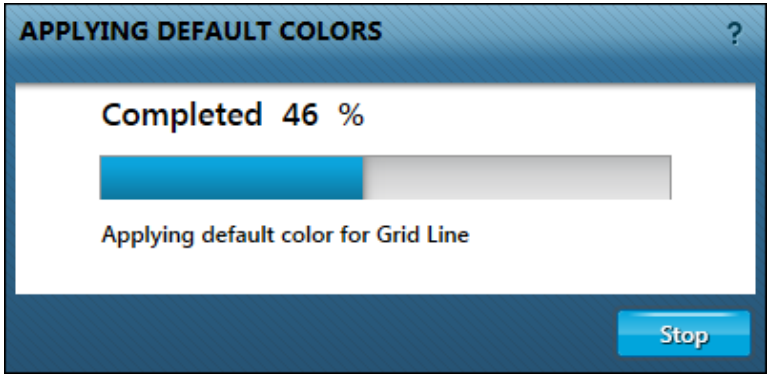
- Define criteria



Default Color Configuration

Apply Default Colors

- New Default Color Rules are applied to new or modified objects automatically
- Apply Default Colors to change appearance of existing objects in the model
- This is a time consuming process and shall be sparsely used



Default Color Configuration

Considerations

- New rules are automatically applied only to new or modified objects
- Colors by default symbology rules are applied only to the simple physical aspect
- Default colors may be used for colors such as object type or fluid code which are not expected to change through the life of the project, SSRs should be used for settings colors based on properties which change as project progresses such as approval status
- 2014 R1 has applied default colors to insulation (translucent white), maintenance and operation aspects (translucent red) but SSRs may be used to apply other colors to aspects
- Avoid testing on production models, time to apply default colors can impact testing time - use a model which has one occurrence of each object type for ease of testing

Default Color Configuration

Considerations

- Colors are not consistently applied on session files created prior to applying changes. New session files are recommended after making new rules.
- When using default colors by Role, the colors will not be dynamically updated for saved sessions. New session files need to be created.
- Colors will not change automatically to Intergraph's new color scheme after a version upgrade of existing models, however new models created with 2014R1 will automatically apply the DefaultSymbologyRules.xml file from SharedContent/xml folder
- Coloring equipment by classification will take care of equipment, components and shapes but for nozzles, edges available on SmartSupport may need be used to select nozzles with specific classification and apply default colors to them

Default Color Configuration

Considerations

- Colors with the ‘Default’ role are automatically applied to SPR session exported from the S3D session, further overrides may be applied using property page for 3D Model Data or ReportSettings.txt for SPR Direct

SETUP AND ADMINISTRATION LAB

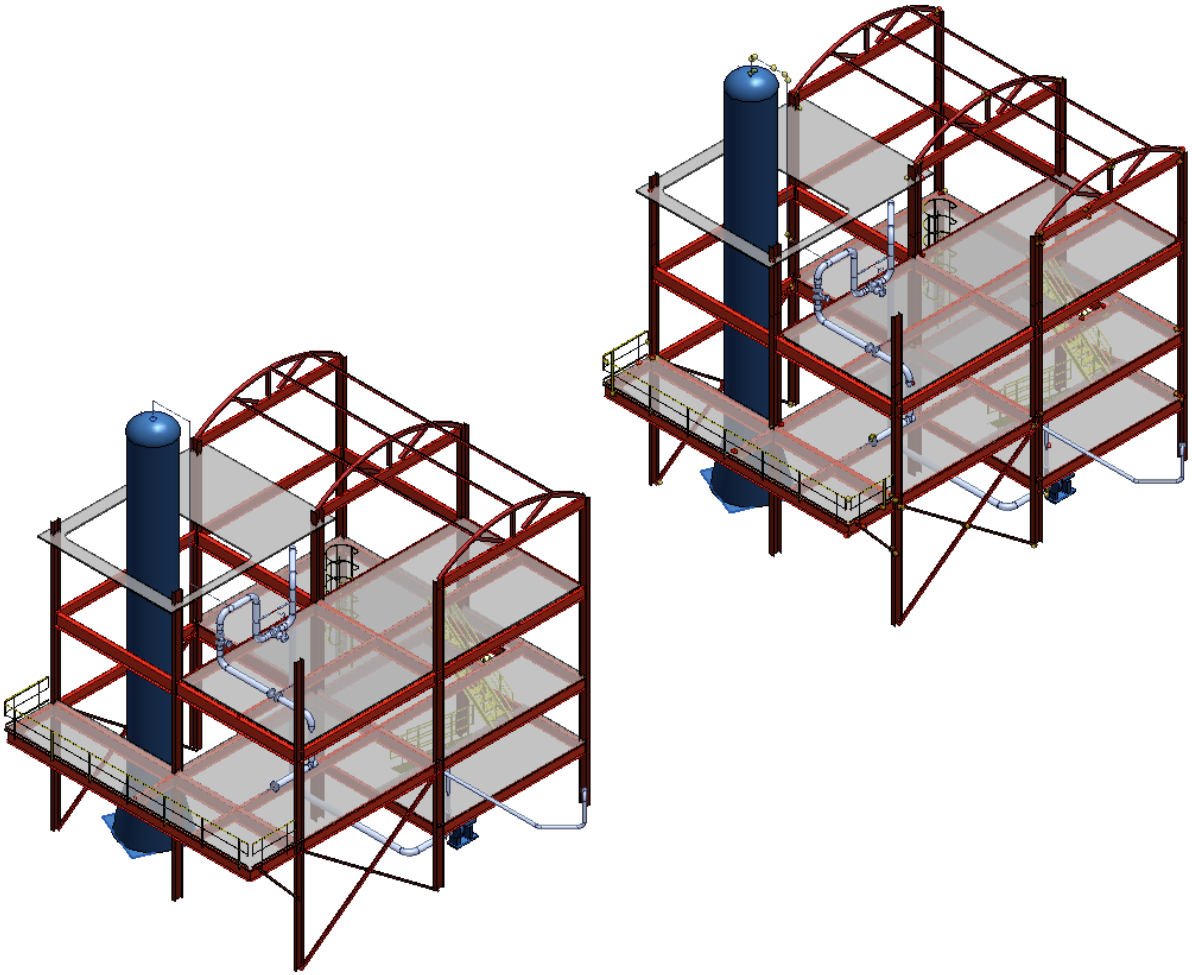
Lab 14 - 15

MODEL DATA REUSE (MDR)

Model Data Reuse: Introduction

- Model Data Reuse (MDR) is a way to copy large amounts of 3D model data in a robust, scalable and intelligent way
- MDR supplements the current copy/paste process – the existing process remains in place for smaller sets of data

Model Data Reuse: Results



Model Data Reuse: Advantages

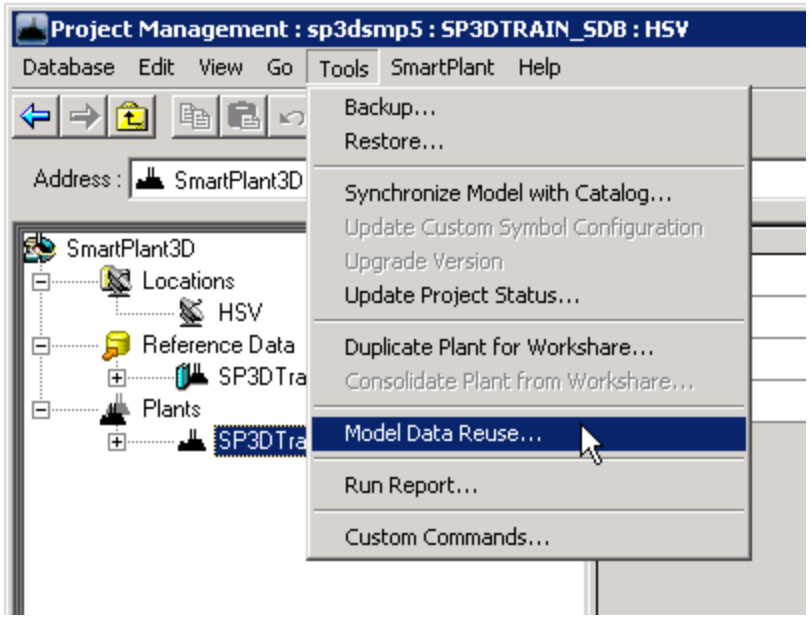
- **MDR runs from Project Management environment as a wizard**
  - Interaction with objects is not required
- **Does not require objects to be loaded into memory**
  - process is scalable and can copy much larger sets of data
- **Software breaks down copy set into multiple transactions**
  - Process is robust and can tolerate a failure; it will continue to copy the rest of the remaining objects

Model Data Reuse: Advantages

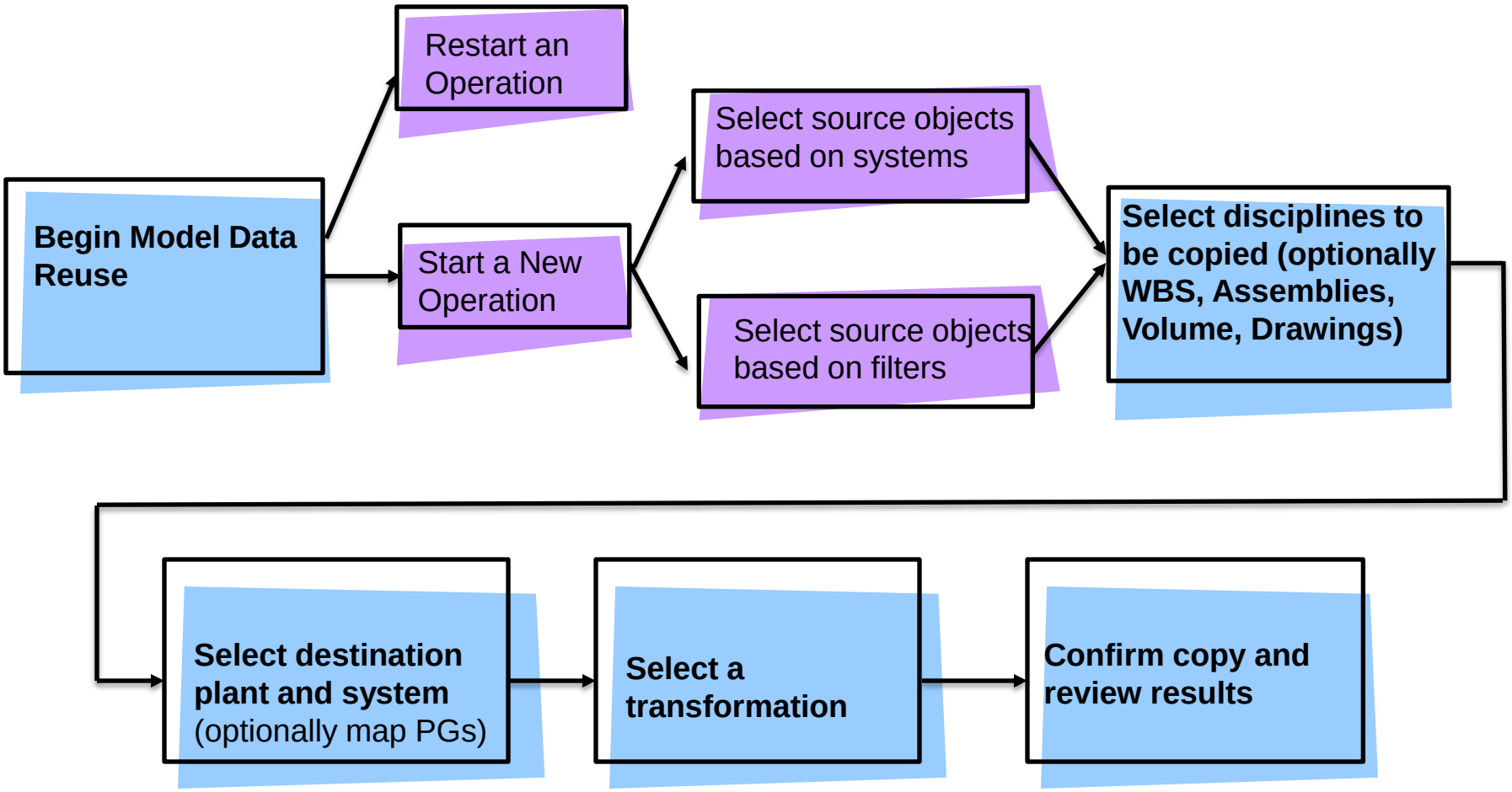
- Software determines the sequence in which to copy objects
- Permission group mapping to existing or default permission group
- Transformation can be chosen using coordinate systems
- Very good logging of process (including failures)
- Copy of model objects between plants is supported
- Re-startable process

Model Data Reuse

- MDR command exists only in Project Management

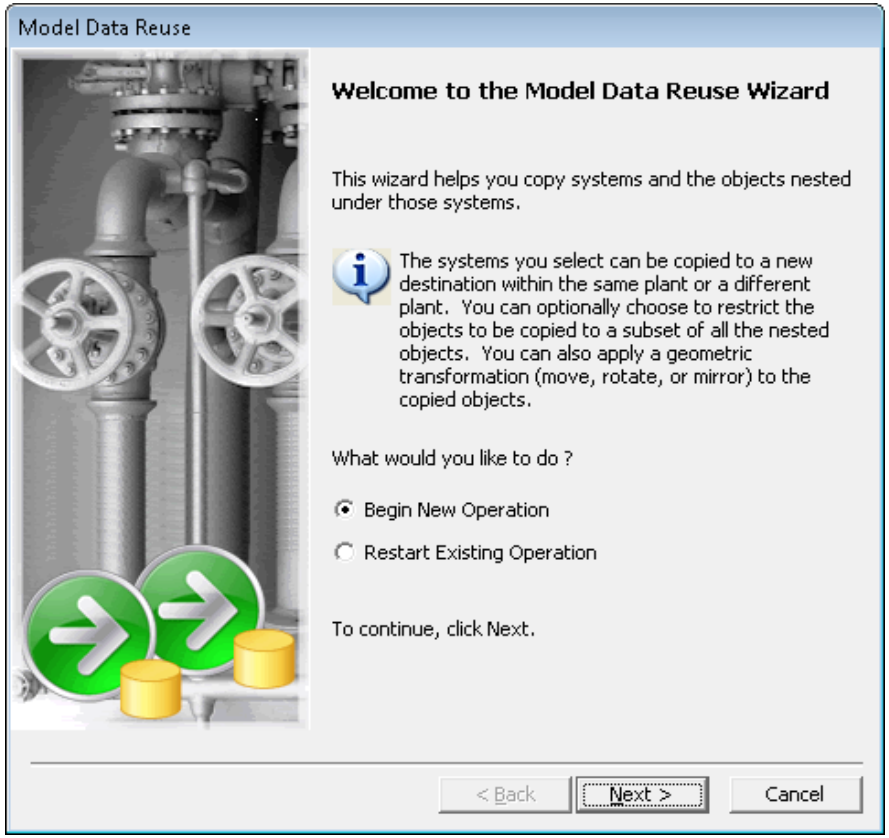


Model Data Reuse Workflow



Model Data Reuse

- The Model Data Reuse command invokes a wizard which allows you to complete the copy operation



Model Data Reuse: Restart Operation

- If the restart operation is selected then the user gets a list of all operations and their status.
- **Possible statuses:**
  - **Stopped:** Process terminated in an orderly way (User clicked stop on the progress button).
  - **Incomplete:** Process terminated abnormally (Hardware/Software failure on client machine).
  - **In Progress:** Operation is restarted on a different client machine.
  - **Completed:** Operation completed successfully.

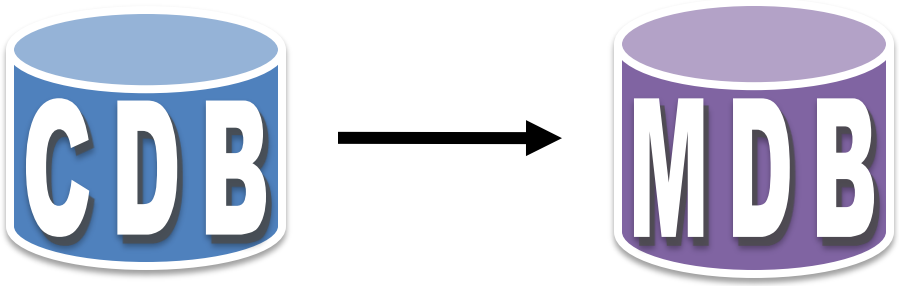
SETUP AND ADMINISTRATION LAB

Lab 16 - 20

SYNCHRONIZATION

Synchronize Model with Catalog

- Used to propagate changes from the catalog to the model (including property, specification, and symbol changes)



Synchronize Model with Catalog

The model database is updated to include the following changes:

- Modifications to properties that have been bulkloaded into the catalog.
- Modifications to name rules.
- parts that have been deleted from the Catalog are added to the **To Do List.**

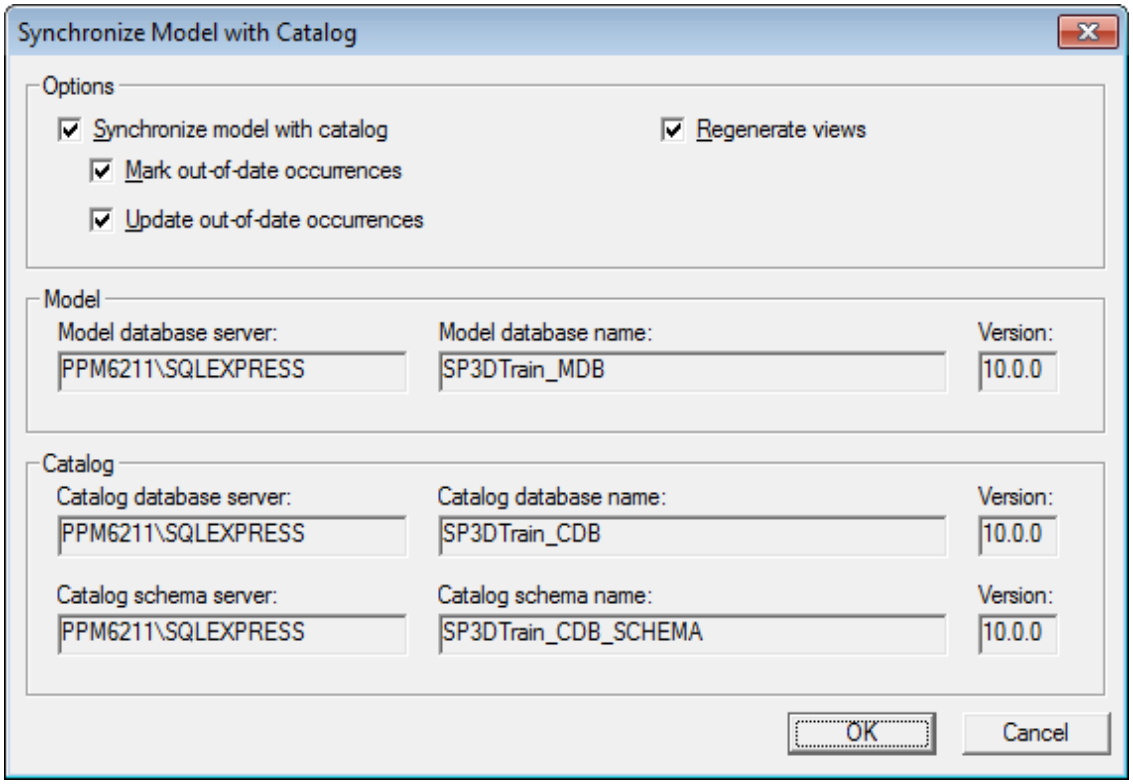
Synchronize Model with Catalog

- Actions performed by the Synchronization command will depend on the level of access of the user running the command from Project Management:

- User with write access to model objects:
  - Extended execution time
  - Model objects will be updated automatically with no user interaction

- User with read access to model objects:
  - Reduced execution time
  - Objects will not be updated automatically (ToDo list entries will be created)

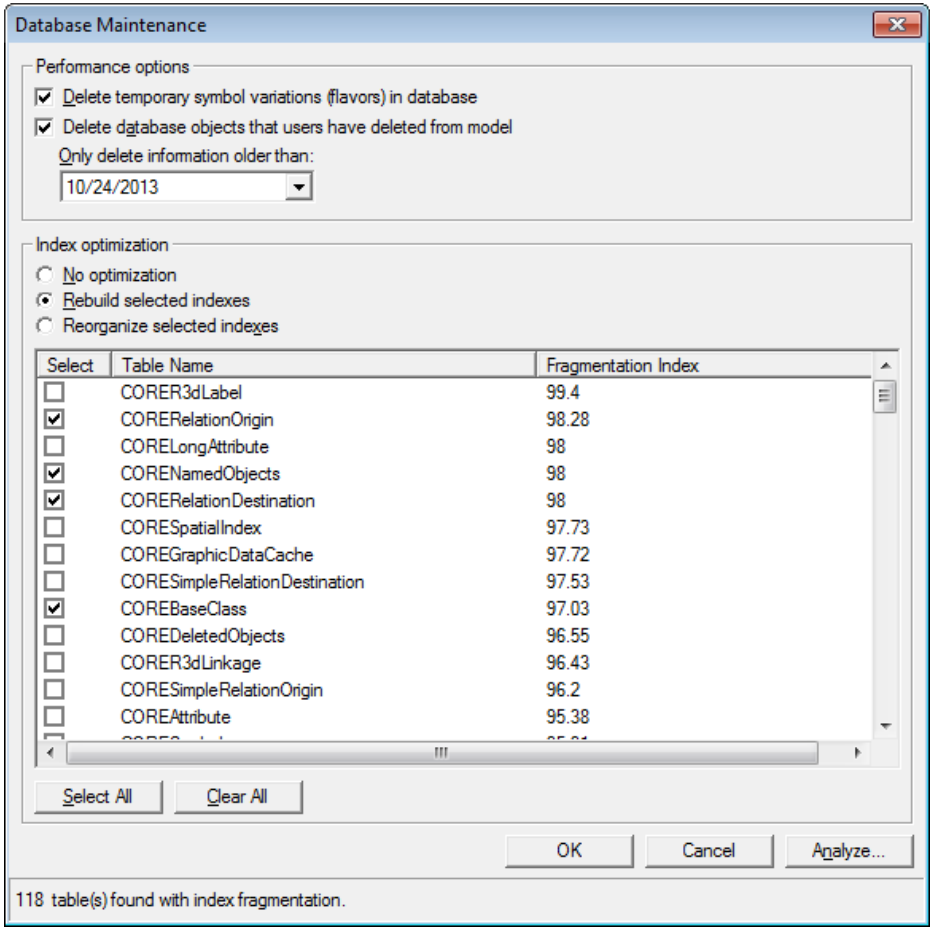
Synchronize Model with Catalog



DATABASE MAINTENANCE COMMAND

Database Maintenance Command

- Provides a tool to purge temporary data that may cause performance issues.



Database Maintenance Command

- Delete temporary symbol variations (flavors) in database
  - These are temporary symbol variations that the software used during creation or placement of certain symbols.
- Delete records of objects that users have deleted from model
- Rebuild selected indexes
- Reorganize selected indexes

DATABASE INTEGRITY

Database Integrity: Overview

- Database integrity problems are issues of the modeled objects that can in some circumstances prevent modeling activities or impact the accuracy of deliverables such as drawings or reports.

- A typical example of a database integrity issue is an object that exists without a mandatory relation to another object in the model.

Important

- These errors are not expected. However, in the event that they occur, you can correct them by perfoming the database integrity workflow in which objects will be addressed
- We strongly recommend that you check the databases from time to time and promptly report any unknown problems to Intergraph.
- If you receive a database integrity error that is not listed in documentation, contact Intergraph Process, Power & Marine Support.

Database Integrity: Workflow

- The workflow to address database integrity issues have three overall steps:

    1. Execute database integrity from Project Management.
    2. Generate a report to review issues found.
    3. Run Clean database command to address problems.

Database Integrity: Execute Database Integrity

- Execute database integrity from Project Management

Check Database Integrity runs directly on a database (Site, Catalog, or Model), and creates records for the objects that need to be cleaned. Once the database has been scanned for errors, you can generate a report to review the errors that the Check Database Integrity command generated.

You can run this command multiple times:

- To check the database for objects with integrity problems
- To confirm that objects have been deleted or cleaned (second pass)

Database Integrity: Generate reports

- Generate a report to review issues found

The software includes various report templates intended for diagnosing database integrity issues. You can run these report templates by opening a session in the software and clicking **Run Report** command from the **Tools** menu. Report templates are located in the **Catalog Reports** tab then under **Report** > **Types of Reports** > **Diagnostics** node. Select any of the four following reports:

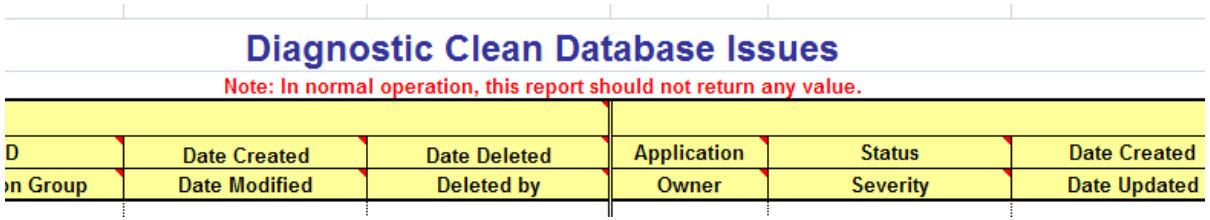
Diagnostic clean database issues

Diagnostic clean database issues grouped by problem description

Diagnostic clean database issues grouped by status

Diagnostic clean database issues with column filters

Database Integrity: Generate reports



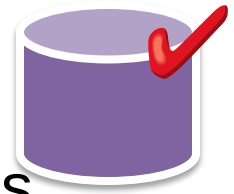
Diagnostic Clean Database Issues

Note: In normal operation, this report should not return any value.

D	Date Created	Date Deleted	Application	Status	Date Created
n Group	Date Modified	Deleted by	Owner	Severity	Date Updated

- **DataStore** Displays whether the problem exists in the model or Catalog database.
- **Problem Description** Provides a brief explanation of the issue. Use it to search more details in DBIntegrity.pdf guide
- **Status** Determines if the issue is new, existing or resolved
- **Severity** Fatal, Crucial, High, or Normal
- **Action to Take** Describes what to do to fix the problem. Possible values include No Action, To Be Removed or To Be Repaired.
  - If the action is To Be Repaired, you should run **Clean Database** custom command.

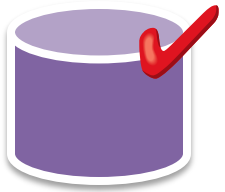
Database Integrity: Run clean database command



Run Clean database command to address problems.

- Consult latest DBIntegrity.pdf document for the correct workflow to fix the problem.
- Most workflows involve use of the Clean Database custom command
  - Action to take = To Be Repaired

Database Integrity: Run clean database command (Cont´d)



- Clean Database Custom Command

SP3DCleanDatabaseCmd.CCheckObj

SETUP AND ADMINISTRATION LAB

Lab 21 - 23

PDS MODEL REFERENCE

PDS Model Reference: Overview

- Prerequisites
- Configuration steps
- PDS Object Filters

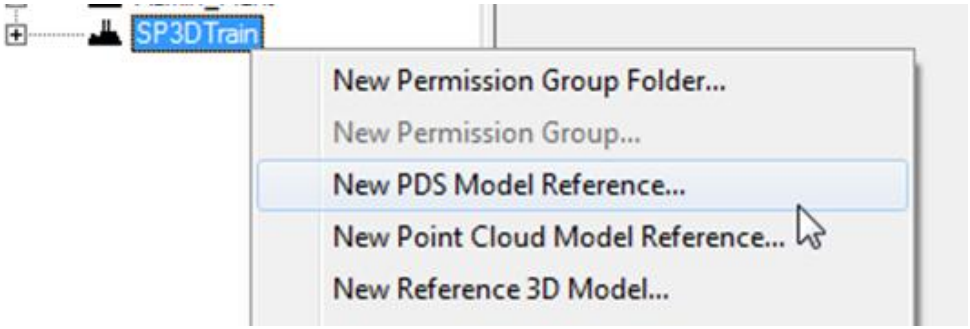
PDS Model Reference: Prerequisites

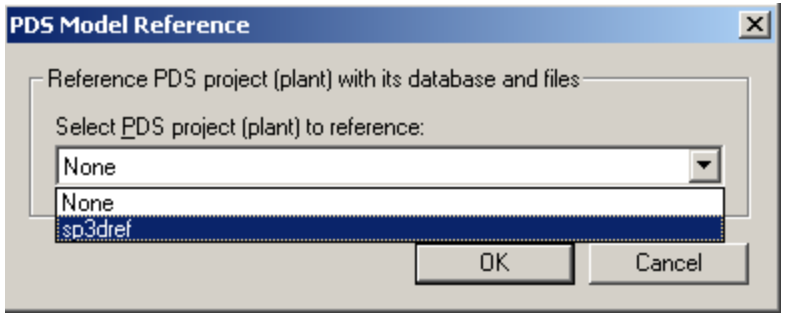
- Before installing PDS Data Access component, you must install the following prerequisite software on a computer on which the Project Management and Smart 3D Server Connectivity options are also installed:
  - Batch Services
  - PD_Shell (Plant Design System Environment)
  - RIS Client
  - PDS Data Access Components (Smart 3D Installation CD)

PDS Model Reference: Configuration steps

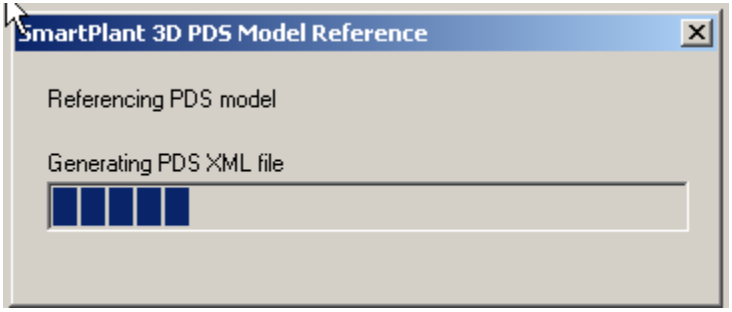
- From Workstation machine with Project Management component installed:
  - Point PDS Configure to appropriate pds.cmd file
  - Point RIS Schema Manager to PDS schema file
  - In Project Management, attach the PDS project to SP3D plant using New PDS Model Reference command

PDS Model Reference: Configuration steps

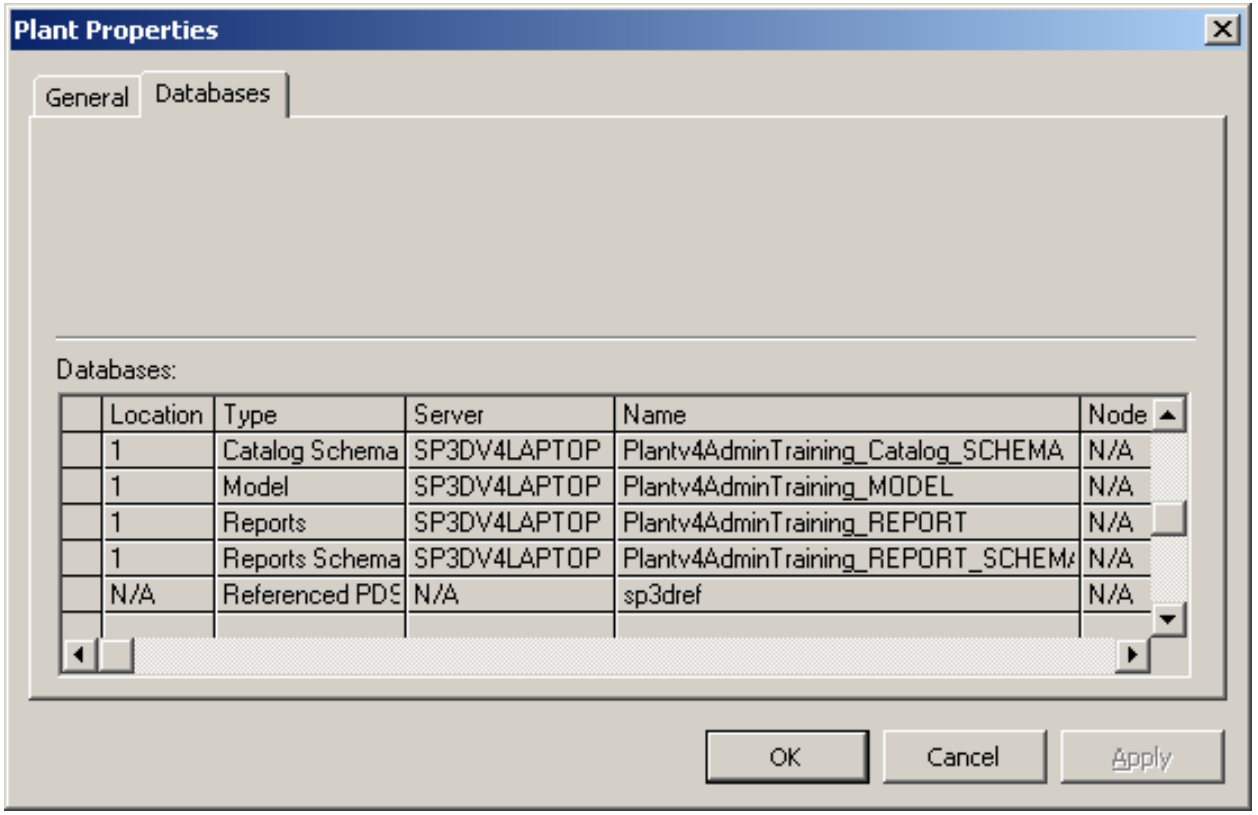




PDS Model Reference: Configuration steps

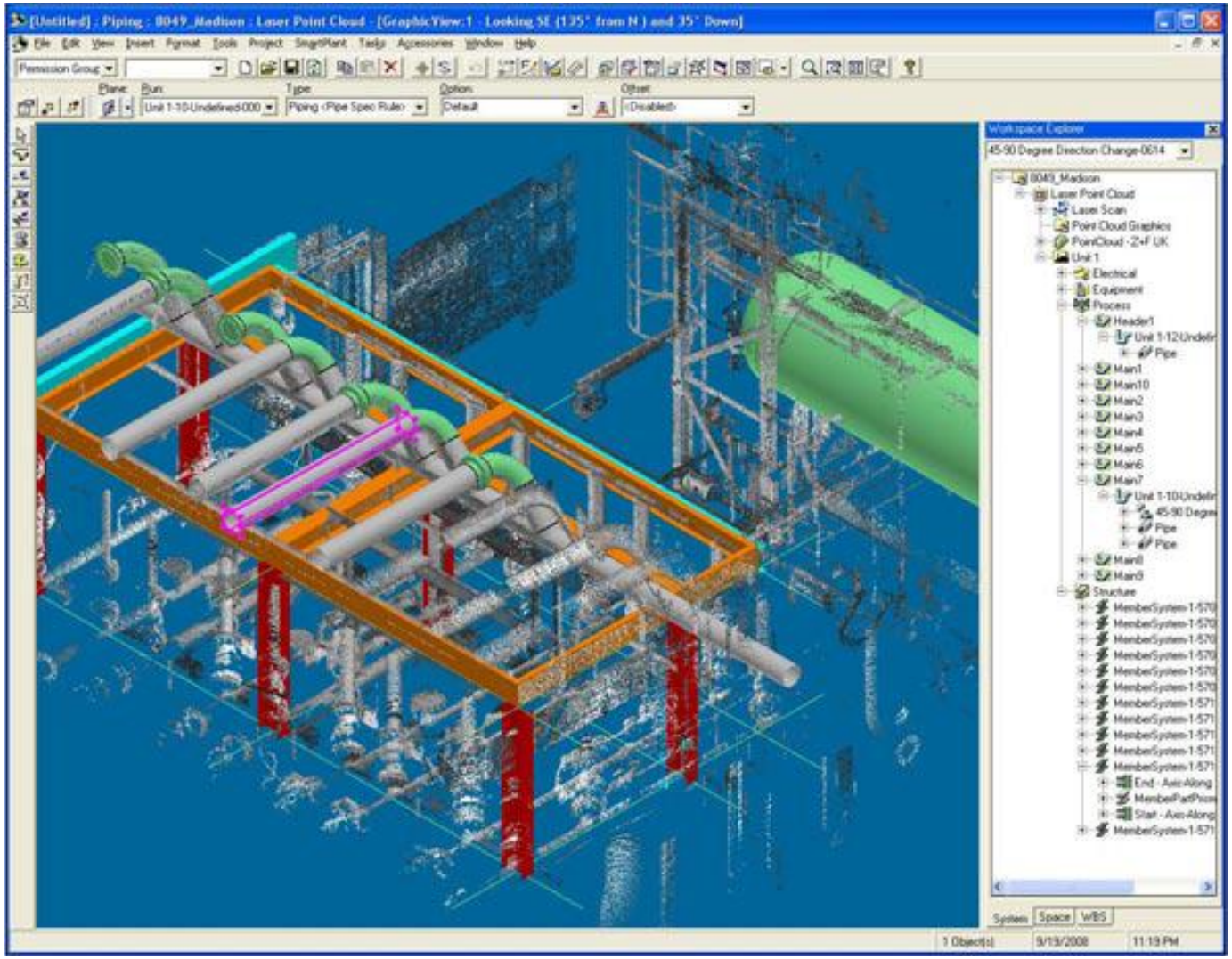


PDS Model Reference: Configuration steps



POINT CLOUD MODEL REFERENCE

Point cloud reference



Point cloud reference

- Smart 3D provides vendor-neutral point cloud data integration within the Plant modeling software environment.
- Saves redrawing an object, while still being able to add to it or build on top of it.

Point cloud reference: Supported point cloud vendors

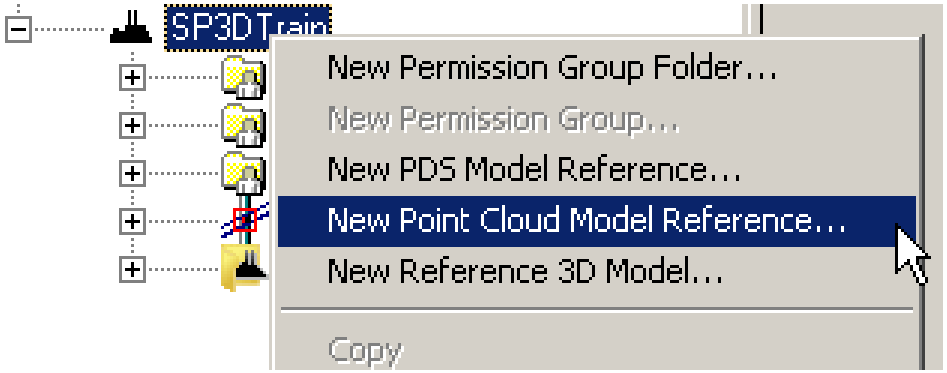
- Leica Geosystems
- Quantapoint
- Trimble
- Z+F UK

Point cloud reference: Possible actions

- Accessing Point Cloud (Accessories menu, filters)
- Selecting a Data Point
- Measuring
- Interference Checking (IFC)

Point cloud reference: Attach Point Cloud to plant

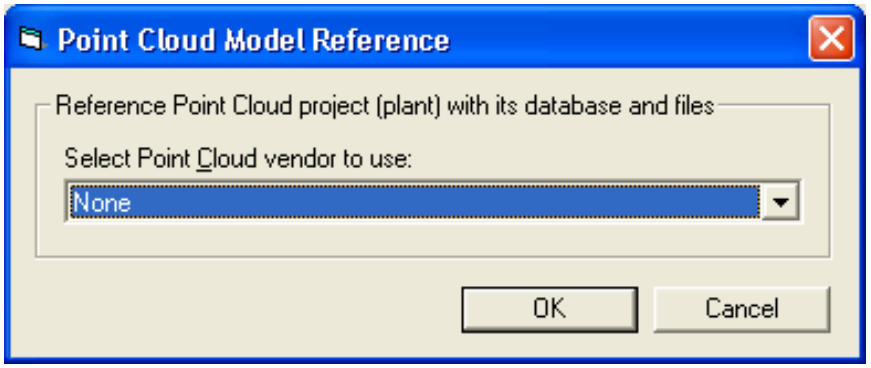
- Right click the plant in Project Management
- Select New Point Cloud Model Reference.



- Select a vendor from the Select Point Cloud vendor to use list.

Point cloud reference: Detach Point Cloud from plant

- Right click the plant in Project Management
- Select “New Point Cloud Model Reference”.
- Select “None” from the list of vendors to use.

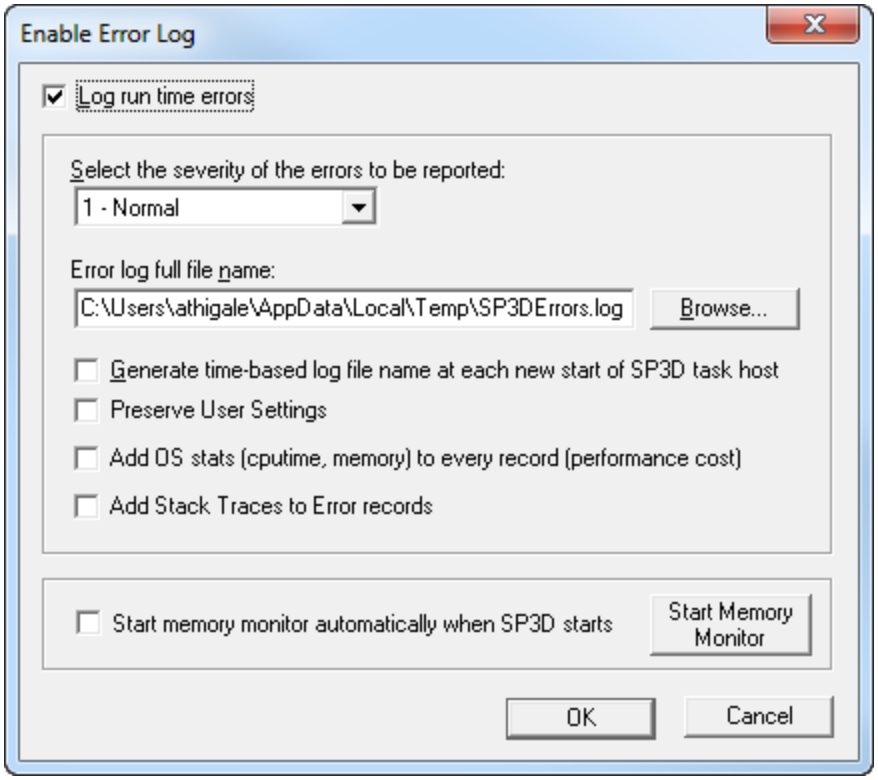


ERROR LOG AND MEMORY MONITOR

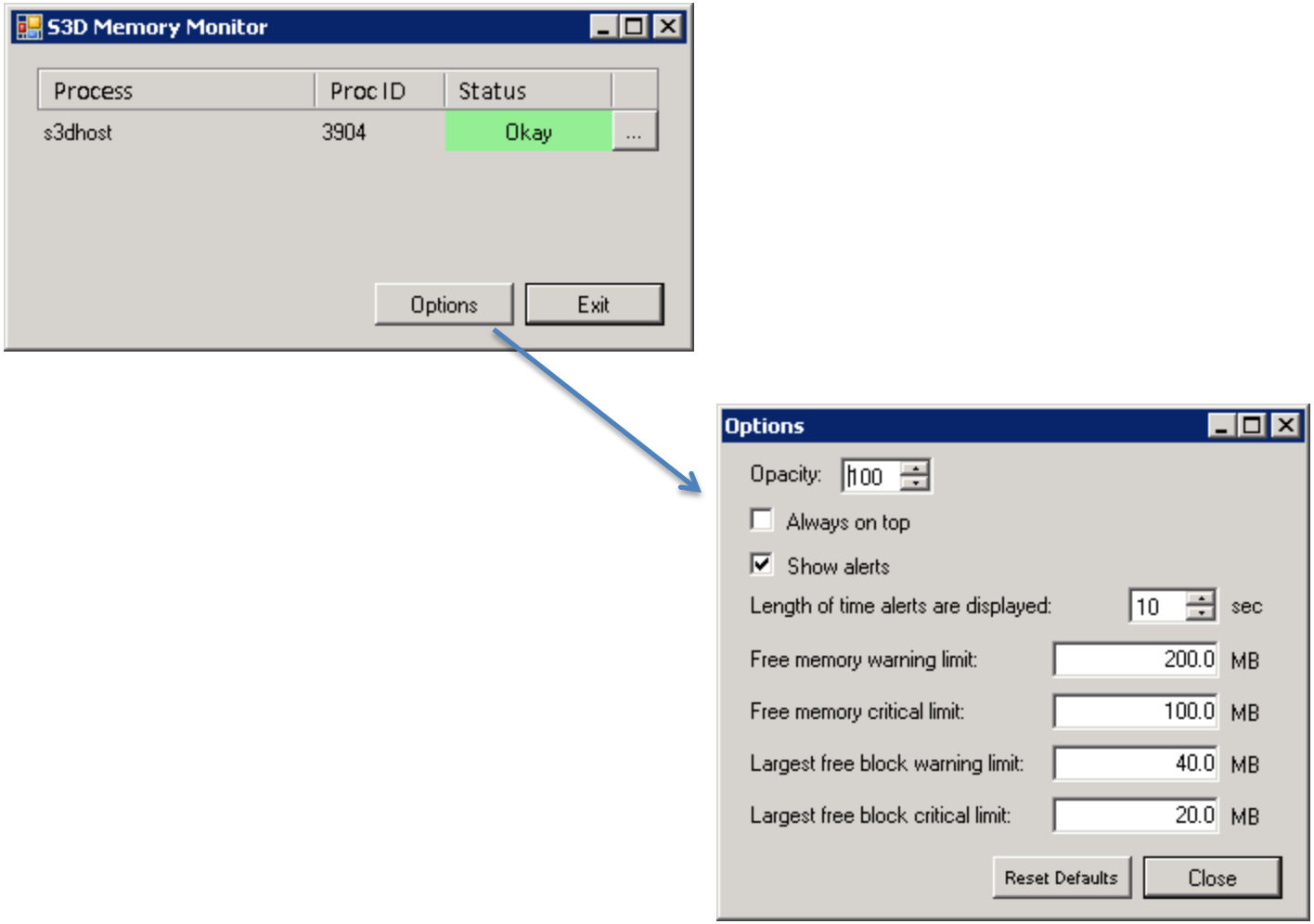
Error Log & Memory monitor

- Error Log
  - On by default, but needs to be set for persistence (cleared when session closes)
  - .Activate using …\Core\Tools\Administrator\Bin\ErrorLogEnable.exe
  - 4 Severity levels
  - Time-based log file names
  - Error log created per session or instance
- Memory monitor
  - Reports memory usage for all active Smart 3D sessions
  - Different reporting states (Warning, Critical)

Error Log & Memory monitor



Error Log & Memory monitor



INTERFERENCE CHECKING (IFC)

Interference Checking Detection (IFC): Overview

Smart 3D provides two methods for IFC operation:

Server-based Interference checking (database detection).

- Runs on a separate server as a Windows NT Service
- Looks for all interferences in the plant

Interactive interference checking (local detection).

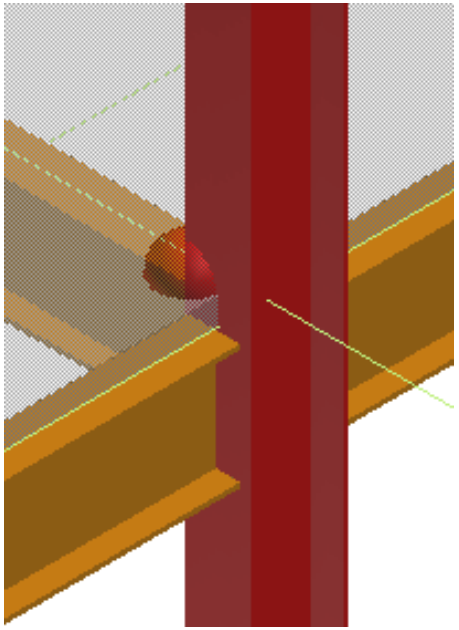
- Helps the designer in real time
- Results are scoped to objects in a session (what you see in your workspace)

IFC: Characteristics

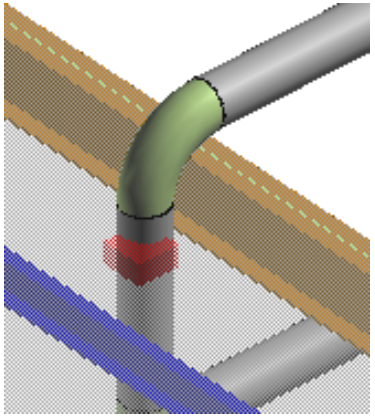
Database Detect	Local Detect
Runs continuously (System Administrator choice)	Works only within the current session
Dedicated server minimizes impact on users and improves performance	Provides immediate graphical feedback (works immediately after commit)
Creates persistent interferences that are stored in the model database	Creates temporary interference markers in a user session
Based on administrator settings (controlled by permission groups)	Based on individual user settings
Provides feed back on how much has been checked	Checks only created and modified items

IFC: Visual differences

Any interference detected by the server based detection method appear as a sphere

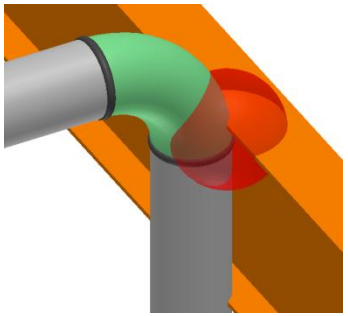


Interferences detected by local based detection method appear as a box

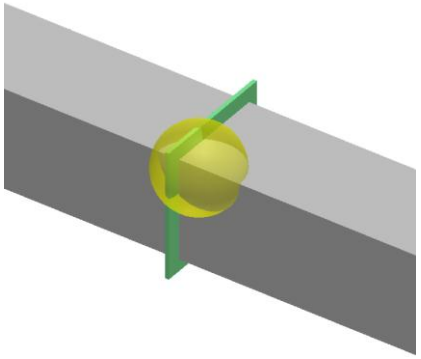


IFC: Visual differences

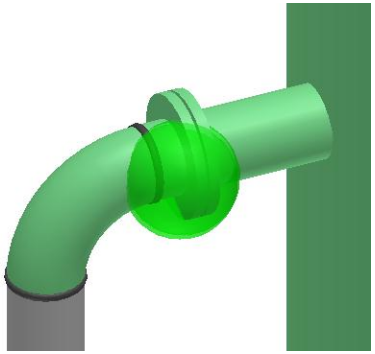
Hard clash



Soft clash



Clearance clash



IFC: Aspects

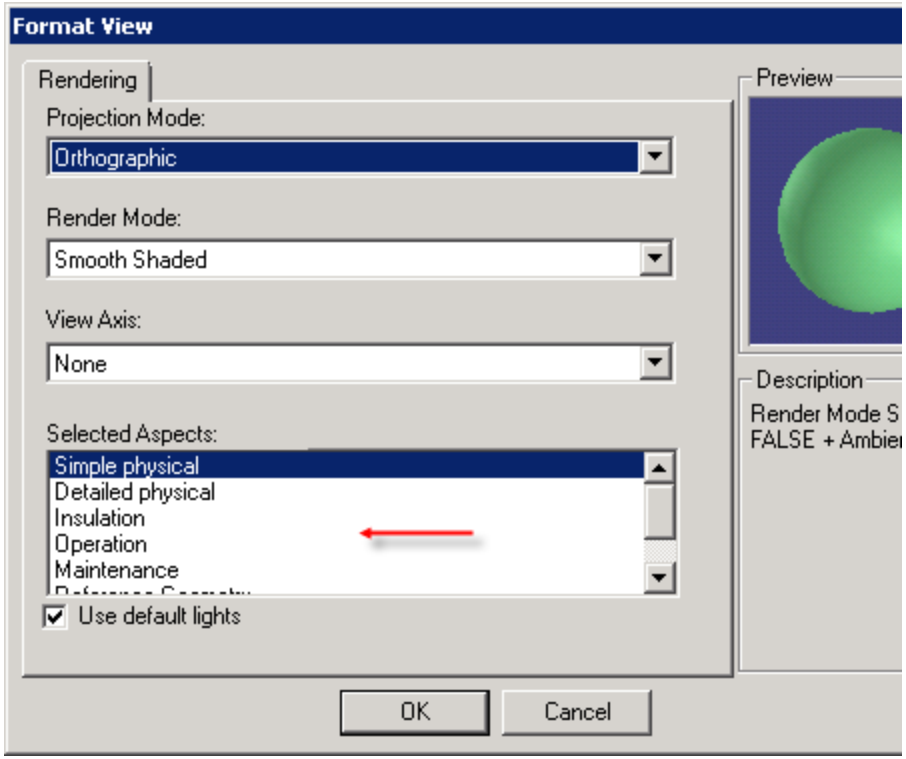
- Aspect: Geometric area or space related to an object, such as its physical shape or the space required around the object.

- Aspects are defined when a part class is created for the reference data.

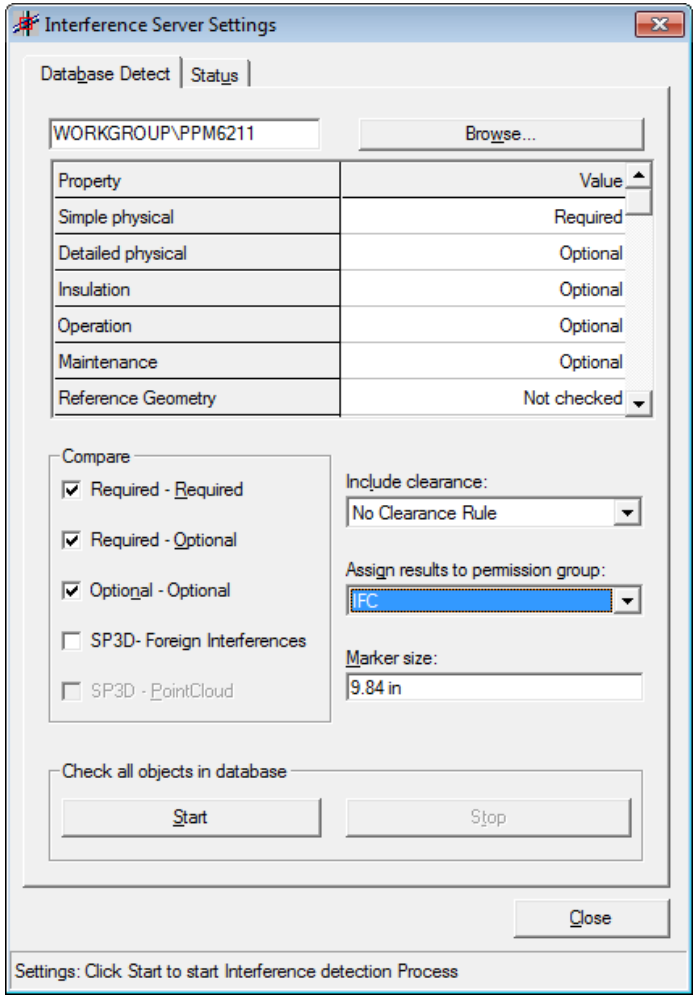
- Aspects can represent clearances for safety or maintenance areas.

IFC: Aspects

- Simple Physical
- Detailed Physical
- Insulation
- Operation
- Maintenance
- Reference Geometry
- Centerline



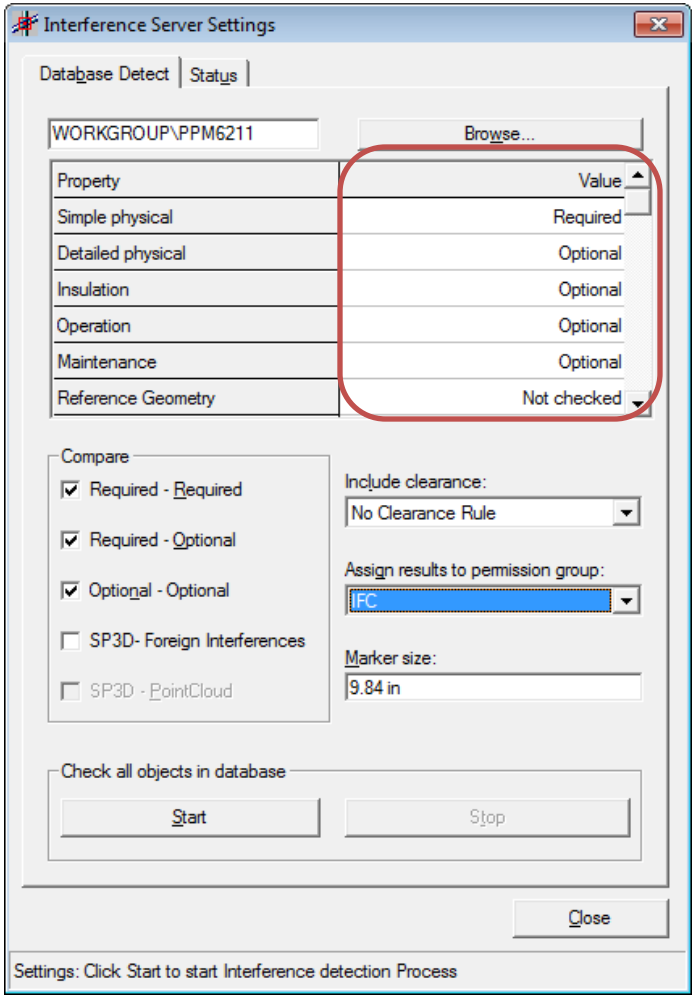
IFC: Configuration



IFC: Configuration – checking priority

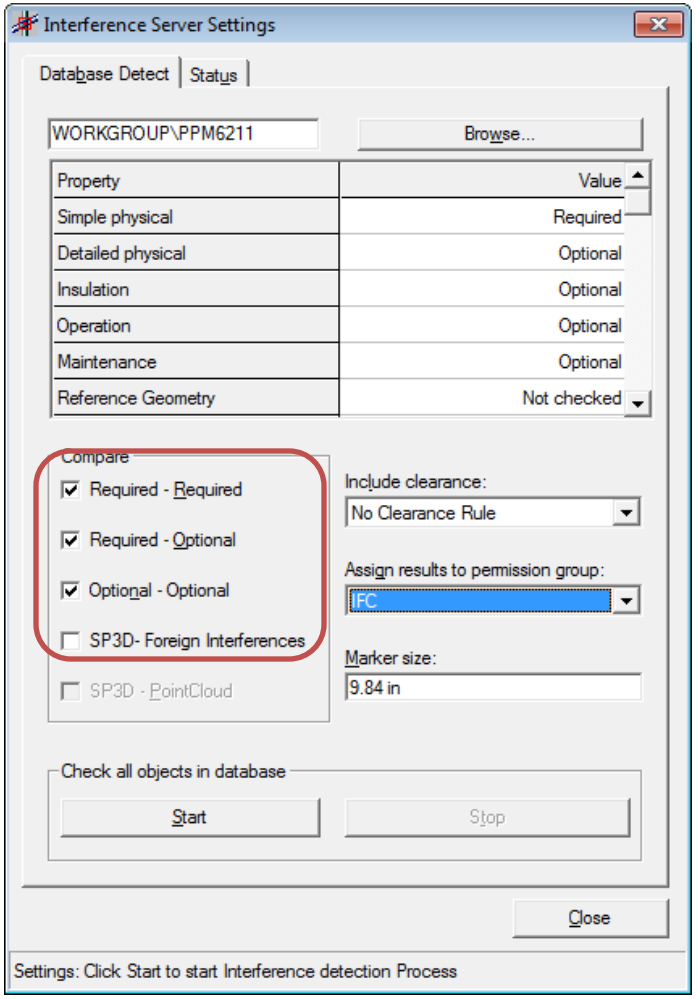
- Three types of checking priorities (based on object aspects):

- Required - Produces a Hard type of clash
- Optional - Produces a Soft type of clash
- Not Checked - Elements currently displayed in this aspect will not be checked for interferences



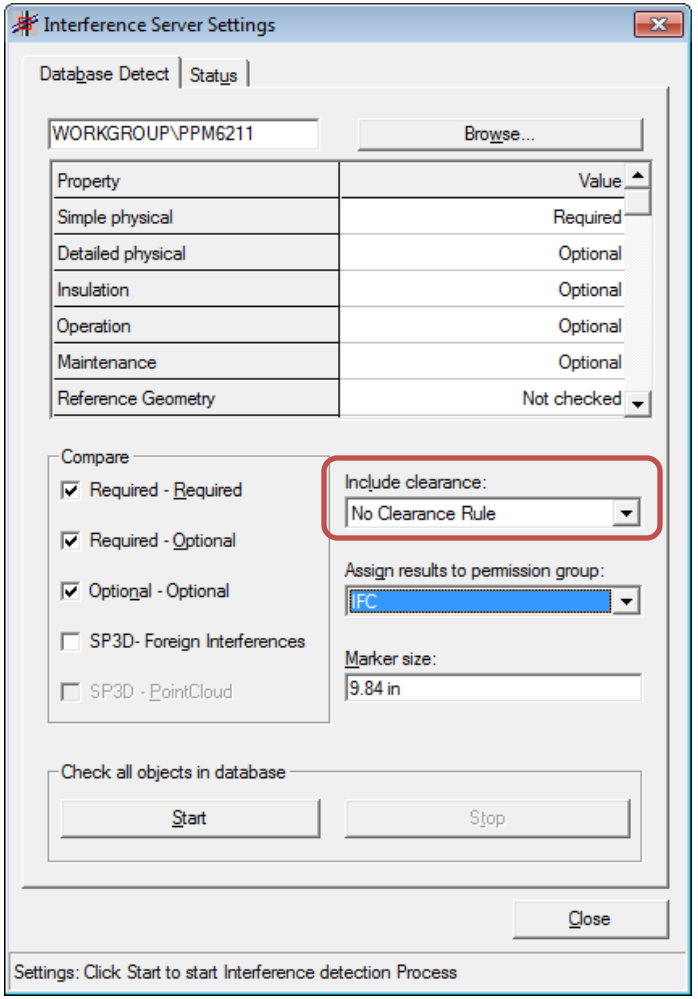
IFC: Configuration – comparison criteria

- IFC can process the following combination of objects based on their checking priorities:
  - Required – Required (Hard – Hard)
  - Required – Optional (Hard – Soft)
  - Optional – Optional (Soft – Soft)



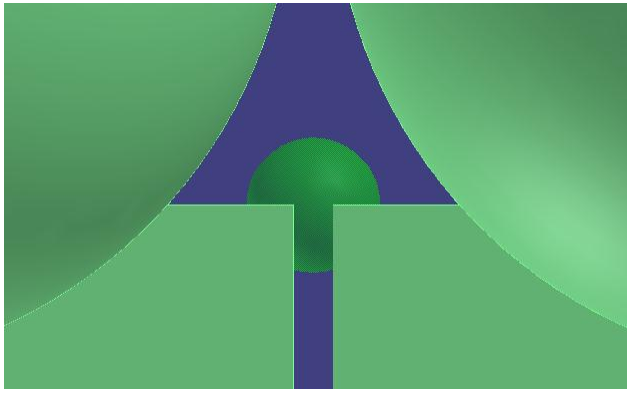
IFC: Configuration – Clearance rule

- Clearance rules define the minimum distance between any two objects



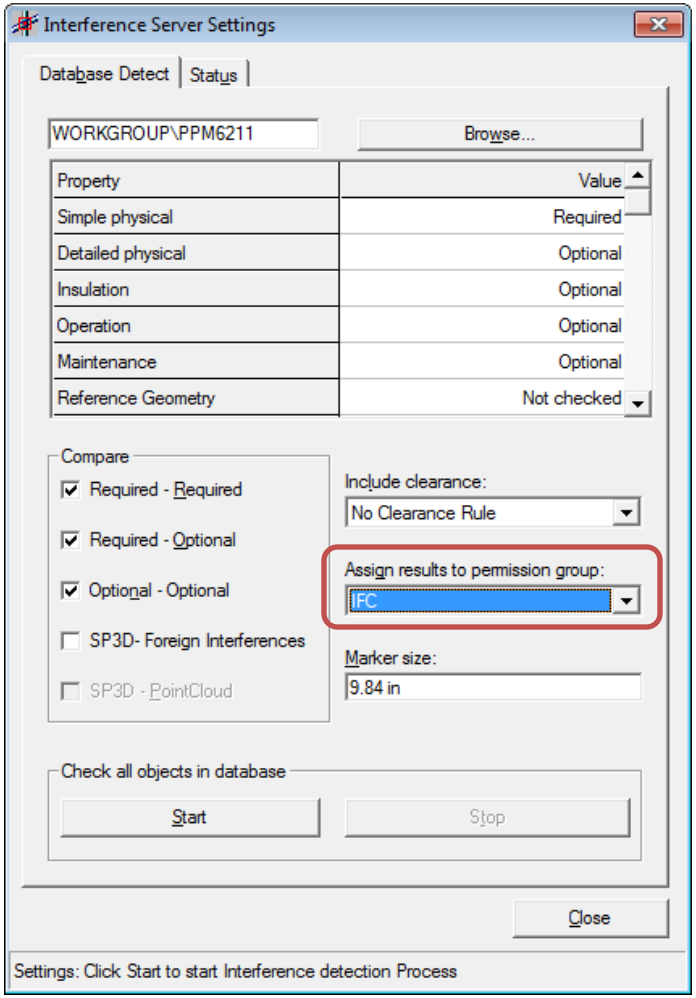
IFC: Configuration – Clearance rule

Equipment		Equipment(s)		
Equipment	Simple physical	Legacy Equipment	Simple physical	100
Equipment	Simple physical	Legacy Designed Equipment	Simple physical	100
Equipment	Simple physical	Equipment	Simple physical	100
		Cableways(S)		
Equipment	Simple physical	Cableway Turn	Simple physical	0



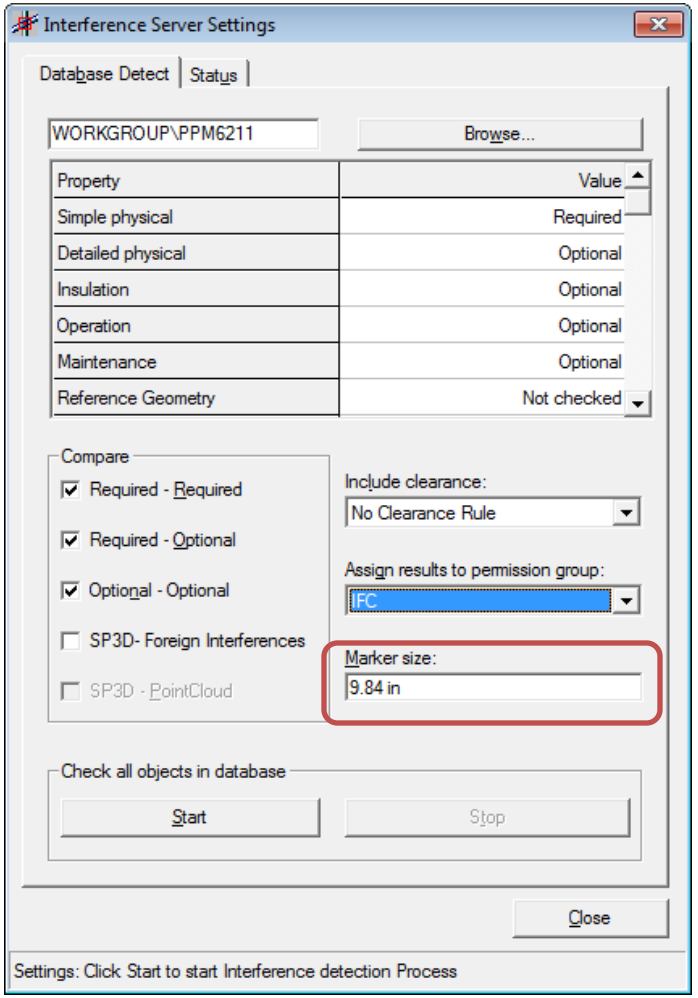
IFC: Configuration – Permission group

- All markers representing clashes or clearances will be assigned to a permission group



IFC: Configuration – Marker size

- Too small and markers may not be visible enough
- Too big and marker itself may hide the object generating the clash



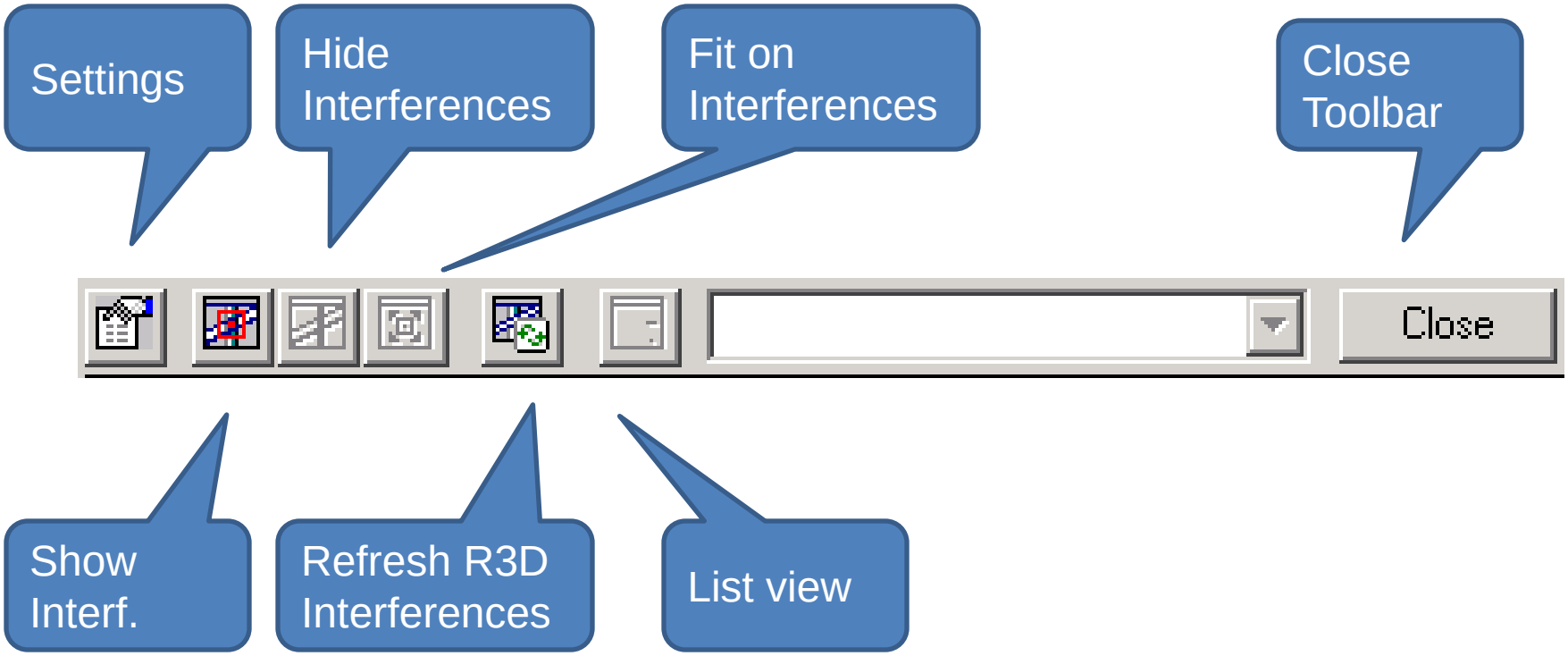
IFC: Local detection

- IFC local detection is available from all tasks in a session (Tools → Check Interference)

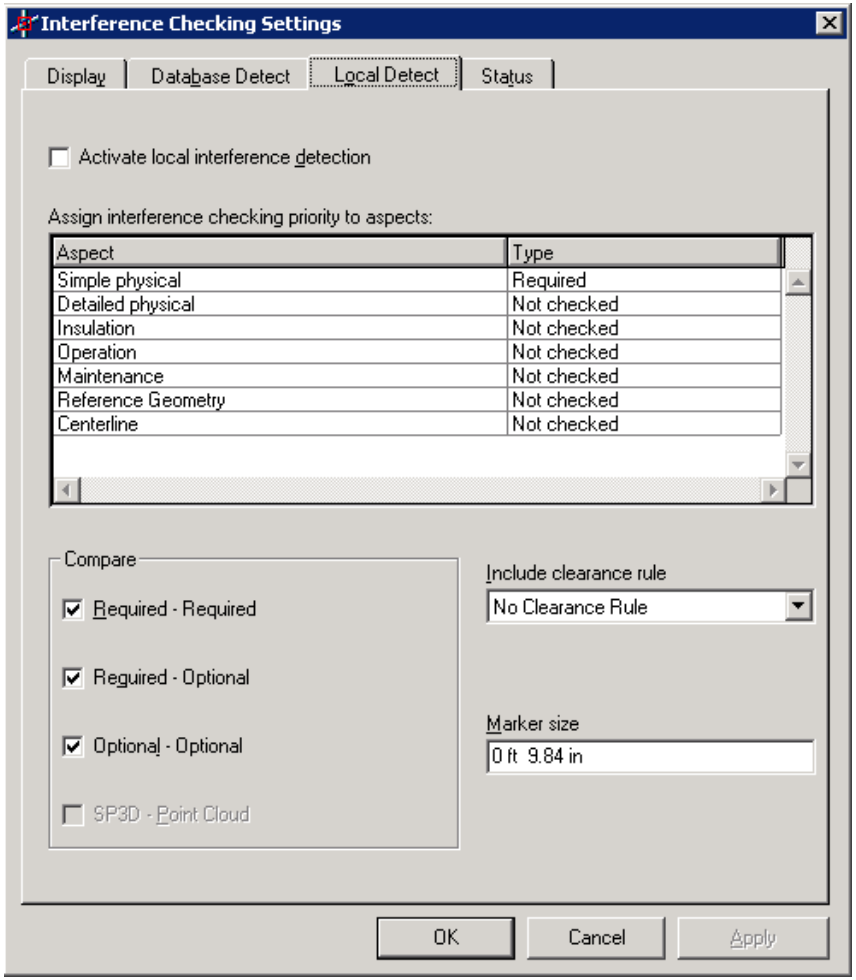
- Very simple and intuitive GUI
- Ribbon bar includes:
  - Settings
  - Visualization
  - Review & approval commands

IFC: Local detection

- Local detection toolbar

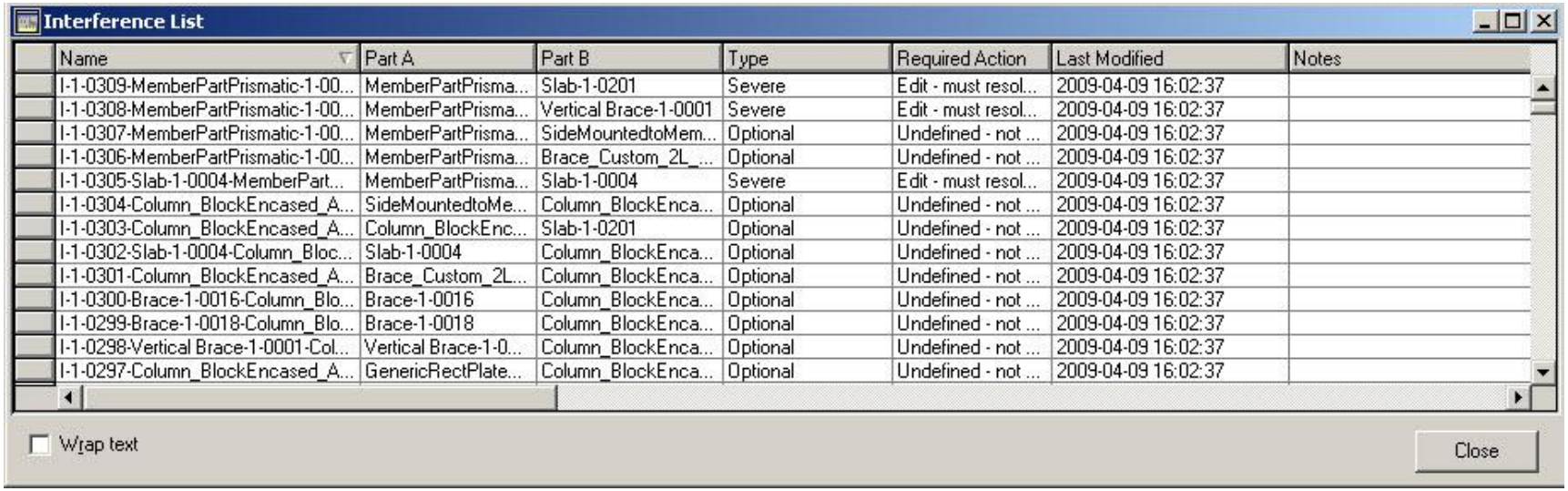


IFC: Local detection



IFC: Local detection – List view

- Show interferences currently displayed in the workspace
- Updates automatically
- Sort by any column



IFC: Database detection

- Verify permission requirements (one time)
- Configure interference service properties
- Start interference detection Windows NT Service
- Create IFC permission group folder and permission group (one time)
- Start database interference detection process

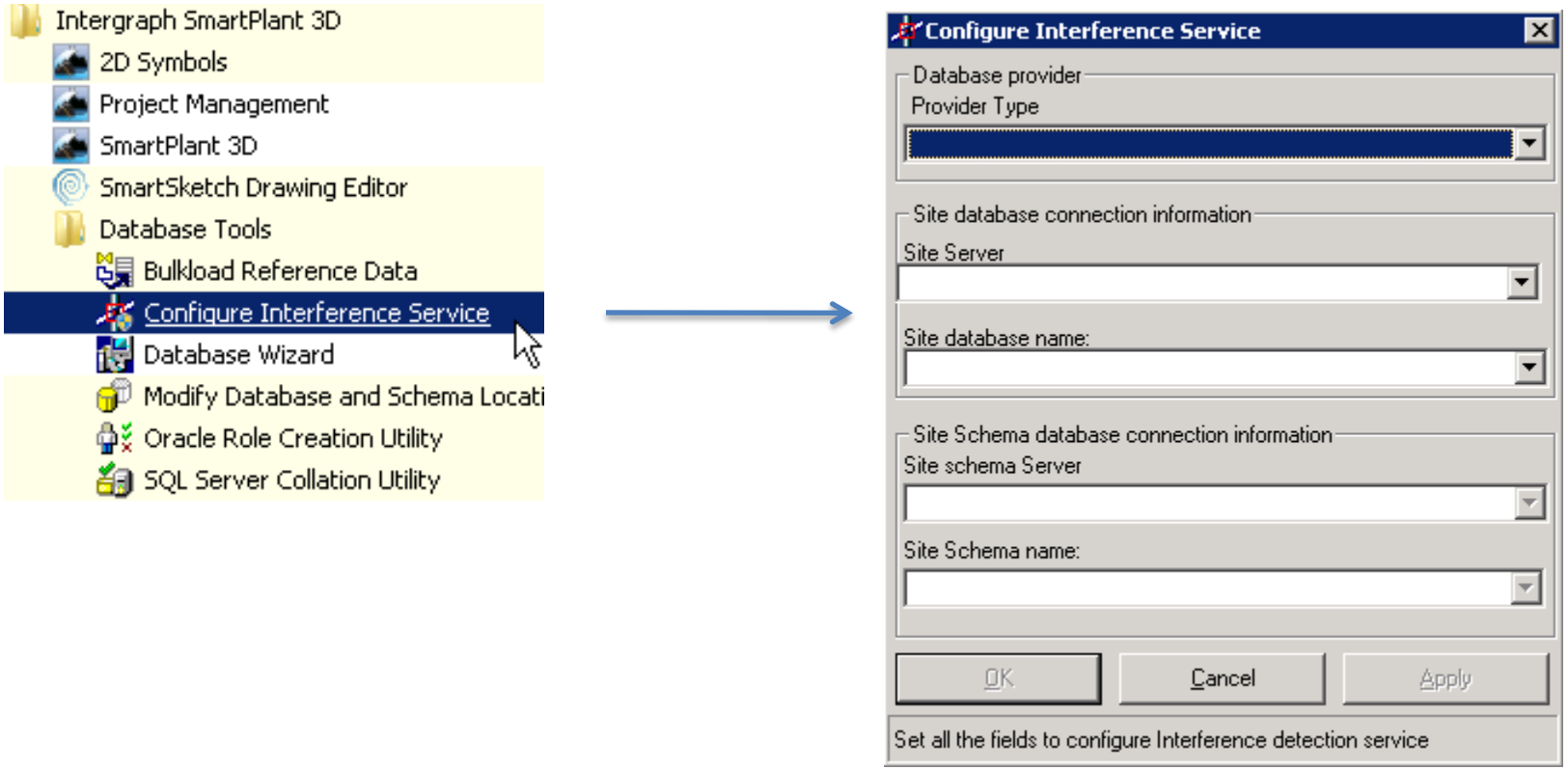
Verify permission requirements (one time)

For the interference database detection process to run correctly, user setting up IFC must meet permission requirements according to the following guidelines:

- **SmarPlant 3D user permissions:**
  - Full Control access at the root of the plant is required to start/stop IFC Process
  - Write access or higher to the designated IFC permission group
- **IFC Windows NT Service login permissions:**
  - Identity for the service must be a domain account that has Write or higher level of access to the designated permission group for IFC. If possible use login with a password not required to change as often as a corporate user account.
  - User needs atleast Read access on SharedContent folder

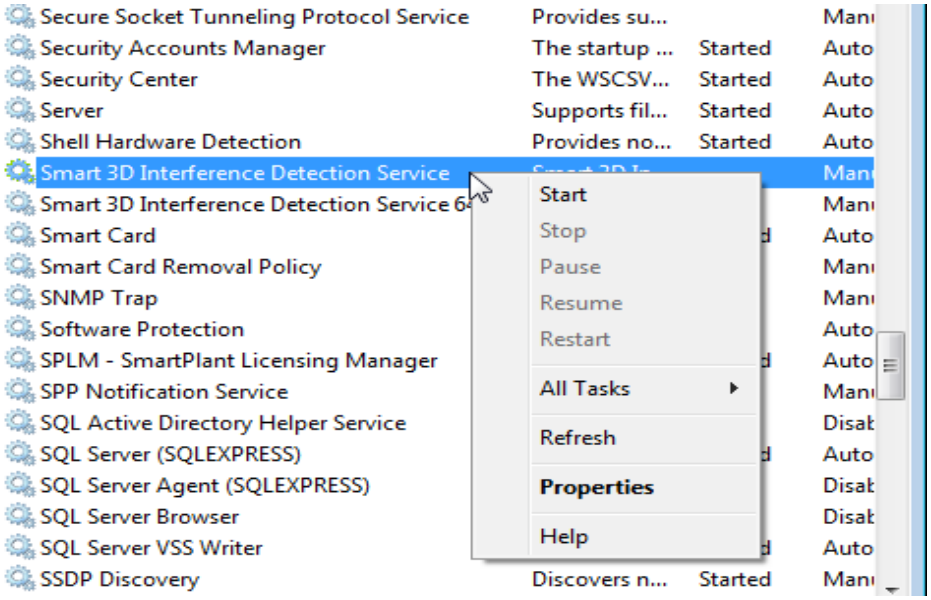
IFC: Database detection

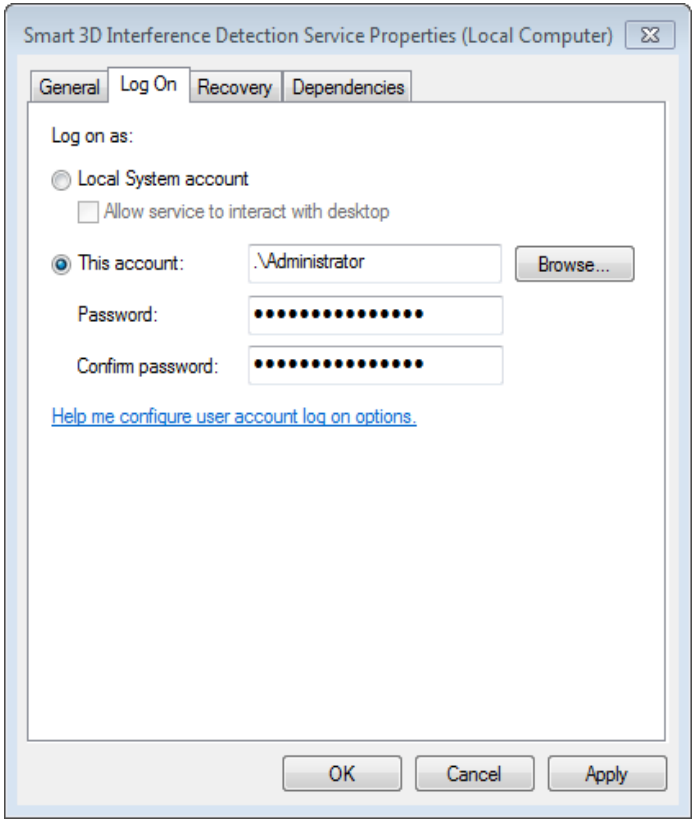
- **Configure interference service properties**



IFC: Database detection

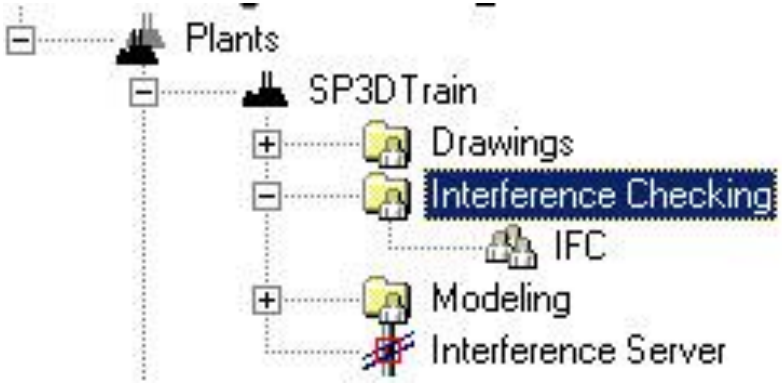
- **Start interference detection Windows Service**





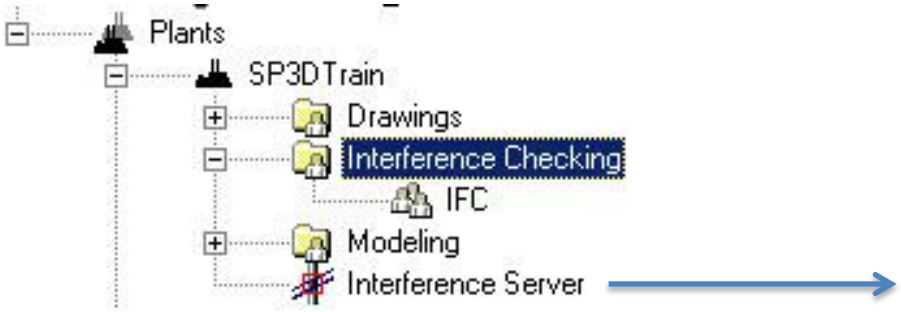
IFC: Database detection

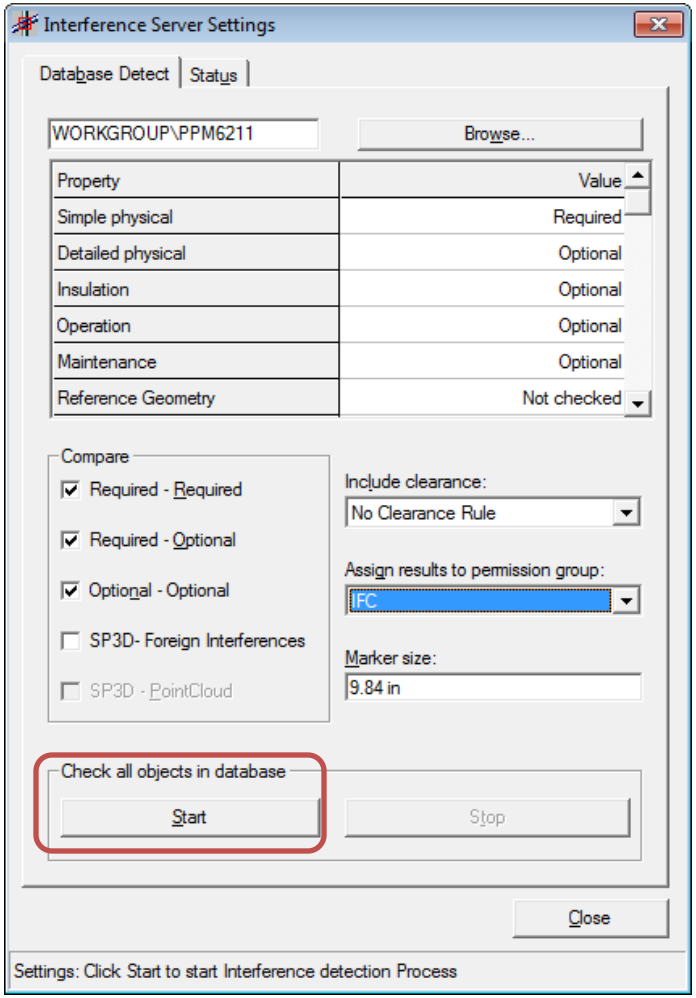
- **Create IFC permission group folder and permission group** (one time)



IFC: Database detection

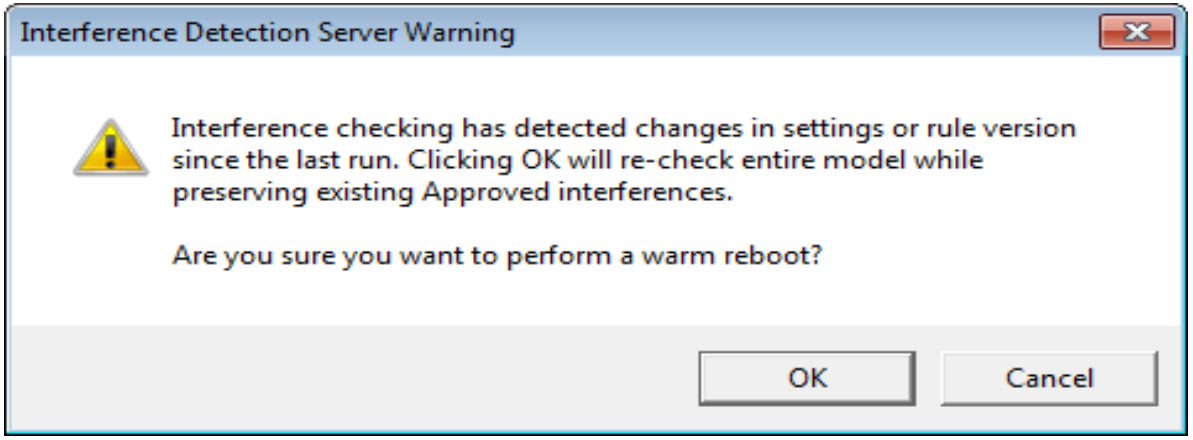
- **Start database interference detection process**





Modifications to Database Interference properties

- If any change to settings on IFC properties form is to be done at any time during the life of the project, all objects in the plant need to be reprocessed from the beginning (0% to 100%).



SETUP AND ADMINISTRATION LAB

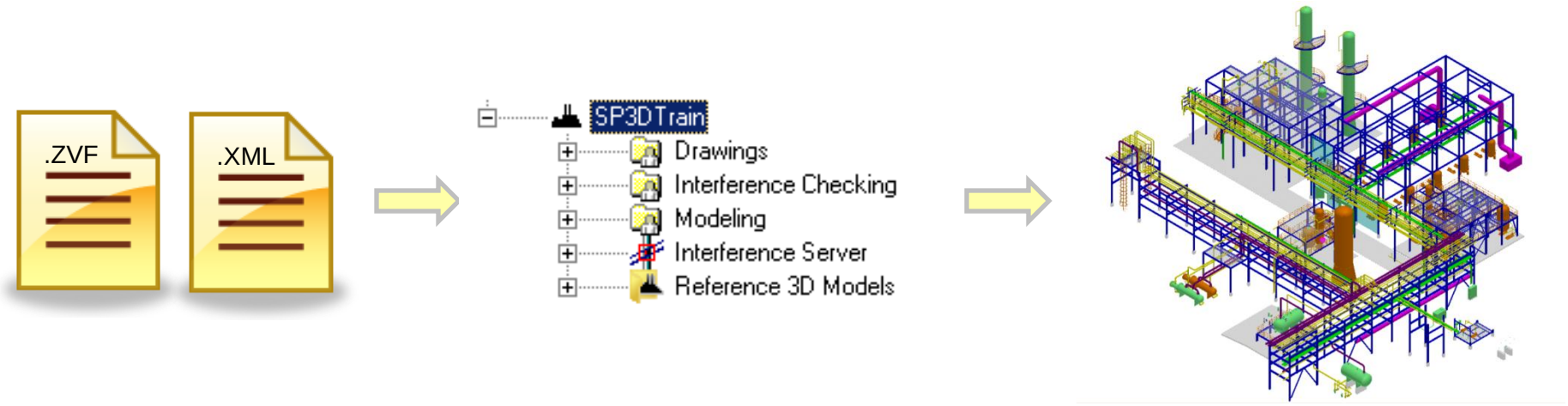
Lab 25 - 26

REFERENCE 3D (R3D)

Reference 3D: Overview

- Reference 3D (R3D) functionality facilitates the attachment of external 3D data as a reference model.
- Such external data might have been published from another Smart 3D model or from a third-party model such as PDMS.
- The data from external models is expected as a set of graphic (.zvf) and data (.xml or .drv) files.

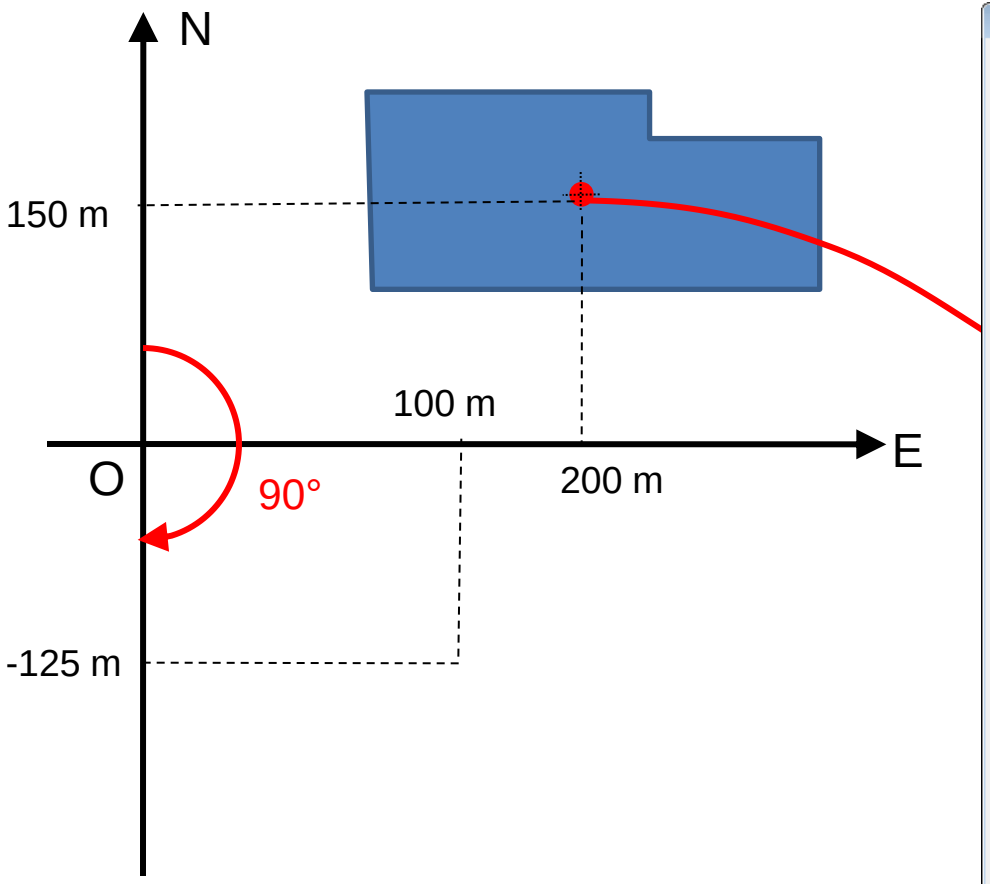
Reference 3D: Concept

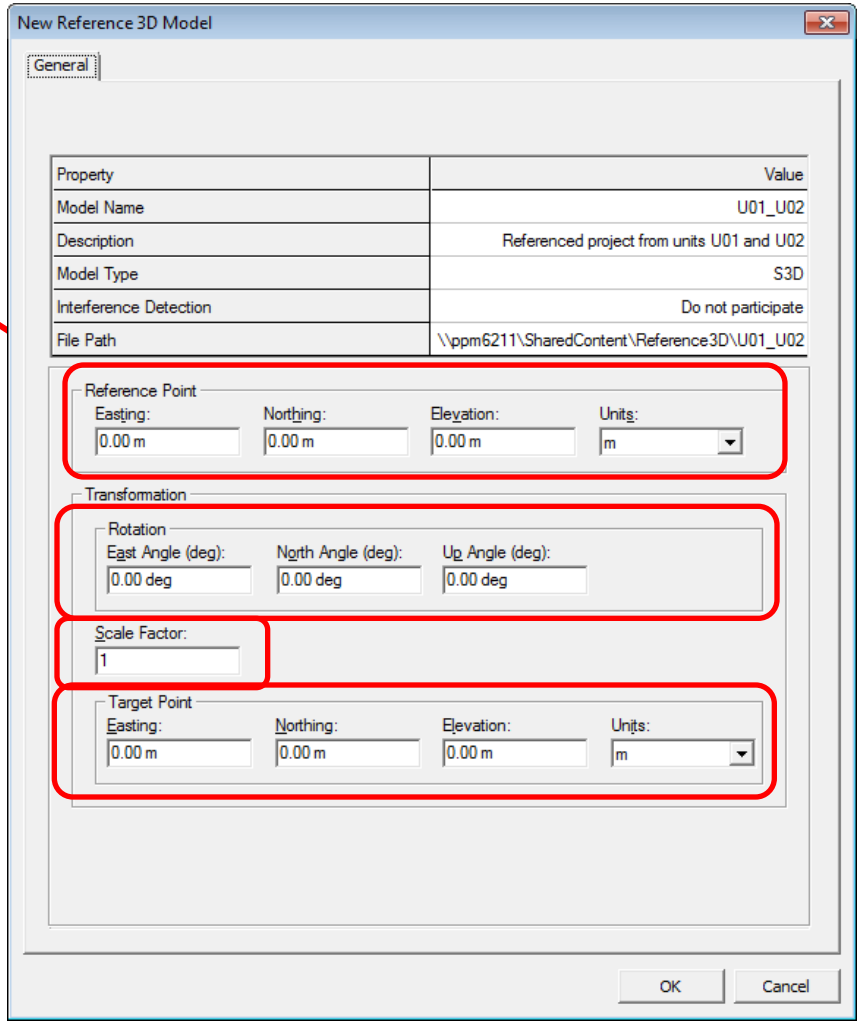


Reference 3D: Functionality

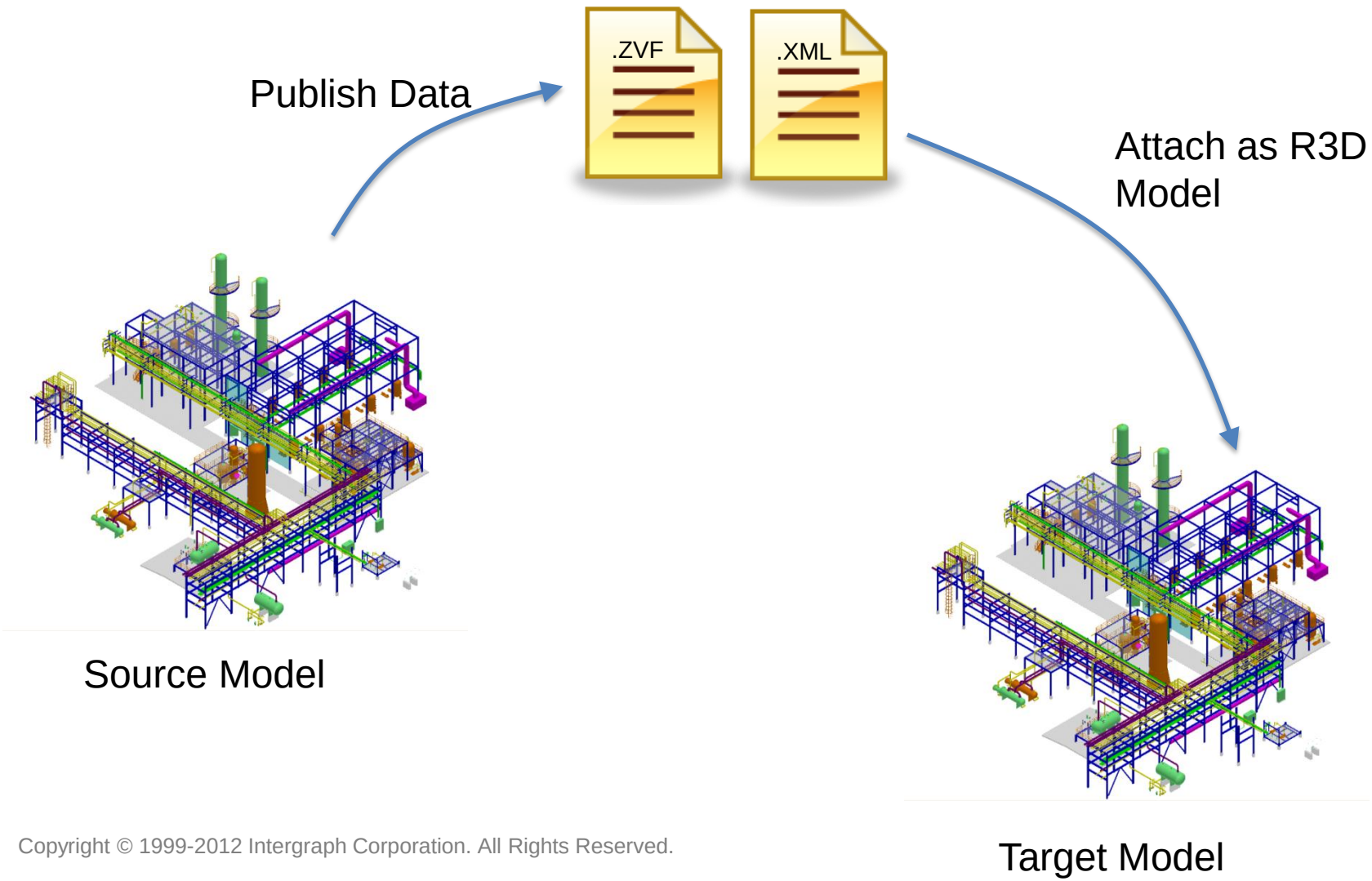
- With Reference 3D you can do the following:
  - Attach and orient (position, rotate, and scale) the reference model relative to the active model so that you can view the R3D data graphically and model against it.
  - Control (add) R3D objects, hierarchy, and properties with user-defined schema and mapping files to extend the delivered R3D schema.
  - Inspect the R3D model objects' properties and view their names through ToolTips.
  - Use a powerful Smart 3D filtering mechanism on R3D Objects to filter objects from Reference 3D Models based on their type—regardless of the authoring tool used for creation (SP3D, SM3D PDMS, and so on).
  - Extract simple General Arrangement drawings showing relative positioning of objects from R3D models, with limited annotation.

Reference 3D: Transformation overview

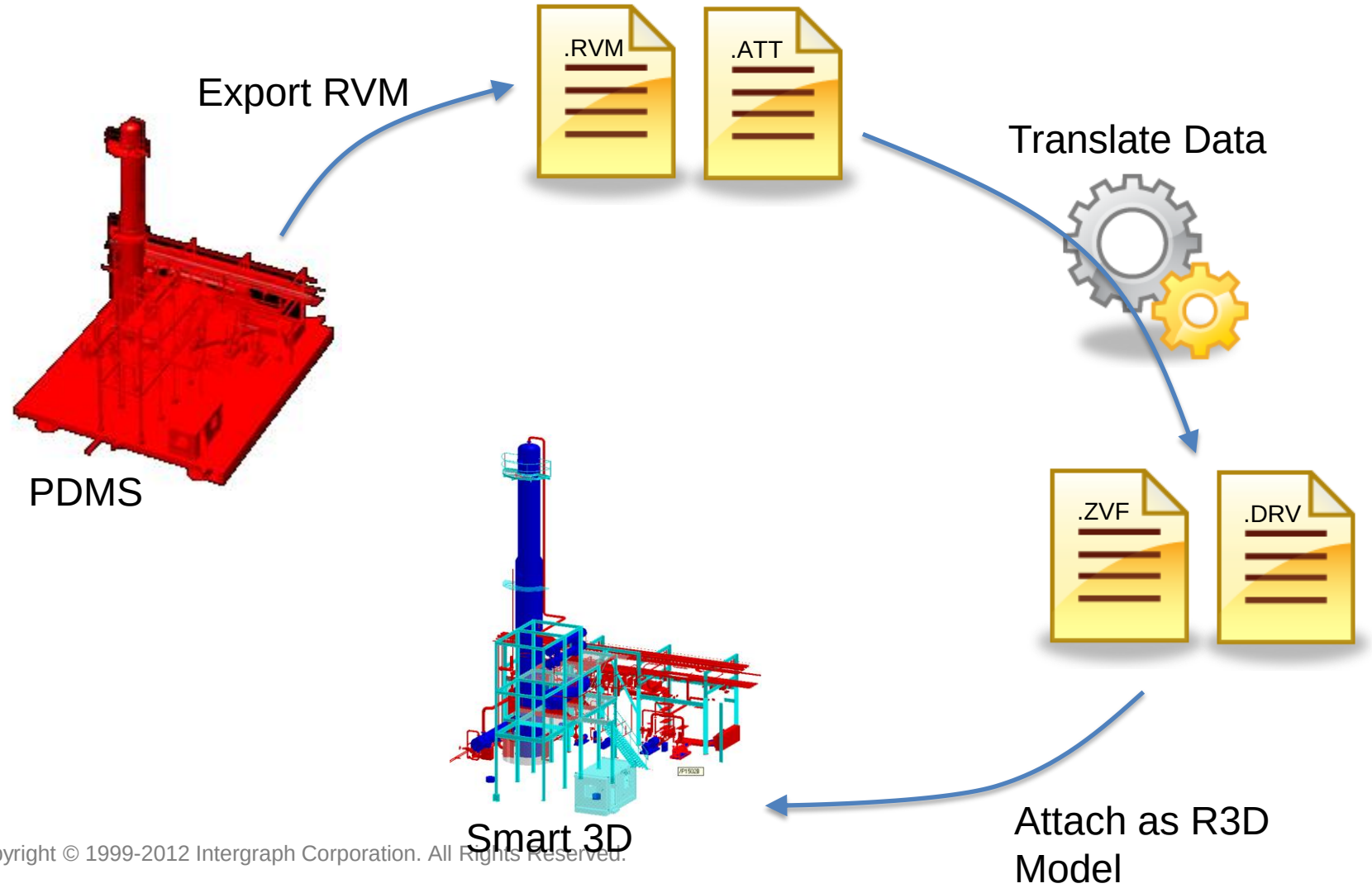




Reference 3D: Attaching Smart3D Models

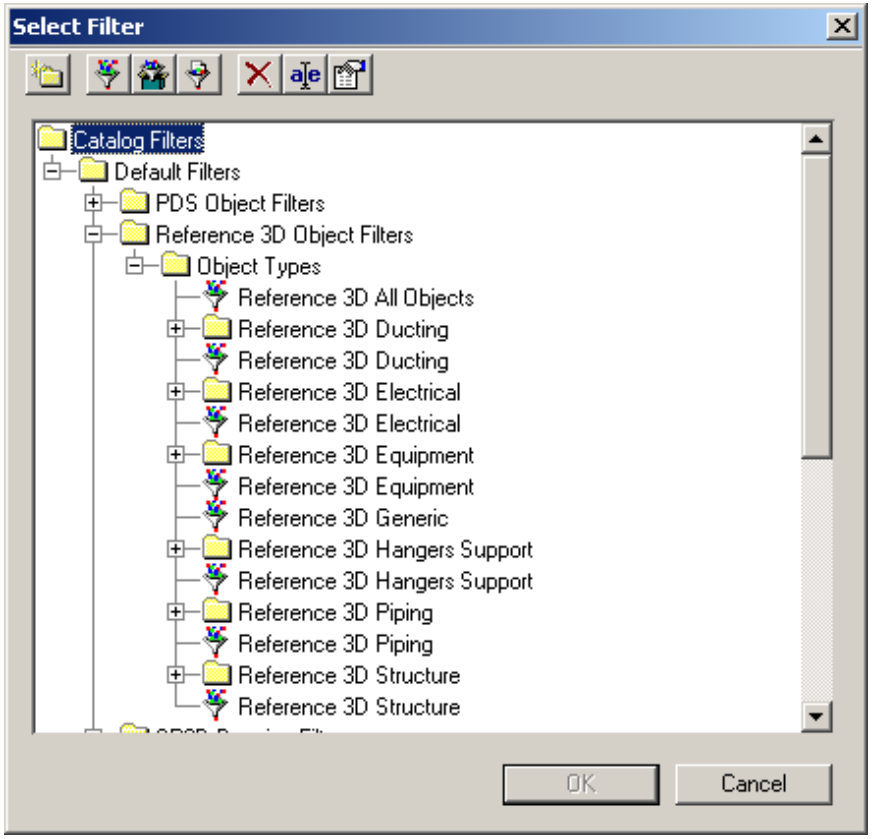


Reference 3D: Attaching PDMS Models



Reference 3D: Filters

- R3D includes a very powerful filtering mechanism that allows you to filter objects from references based on their type, regardless of the authoring tool used for creation (Smart 3D, PDMS, and so on).



Reference 3D: Business cases

- Some of the business cases provided by this functionality include:
  - Supporting disconnected workshare
  - Preserving intellectual property in joint venture projects
  - Allowing for better security in joint venture projects
  - Compatibility between datasets from different S3D versions
  - Bridging differences between S3D datasets on disparate databases (Oracle vs SQL)
  - Ability to work with datasets from external tools such as PDMS, XMpLant
  - Support parallel design for increased productivity

Reference 3D: Business cases

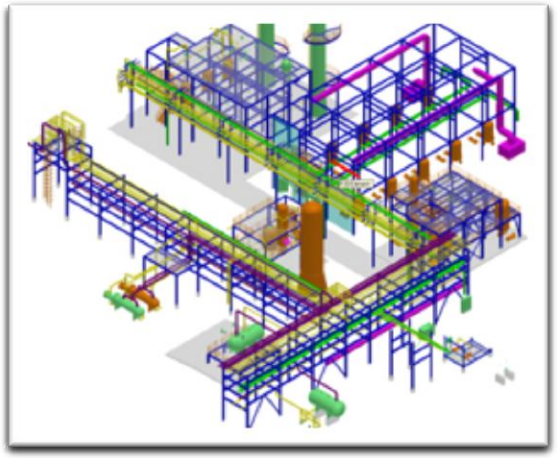
- Some of the business cases provided by this functionality include:

Supporting Disconnected Workshare

Since the data is published to files at the source location(s) and attached as a reference at the target location, live connection between the databases is not required.

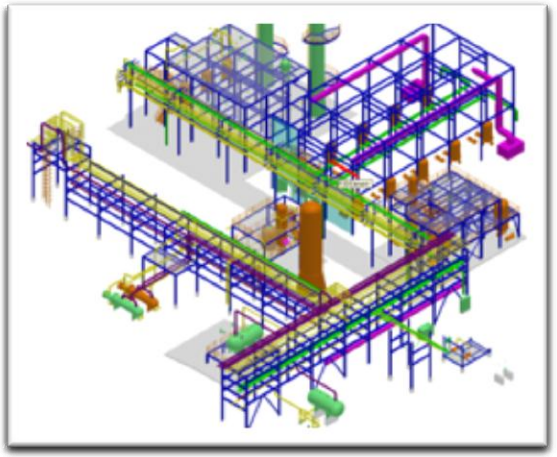
Periodic publish and update of the R3D models would allow multiple partners to work on a joint venture product in a disconnected manner.

Reference 3D: Business cases – disconnected workshare



Publish

Update



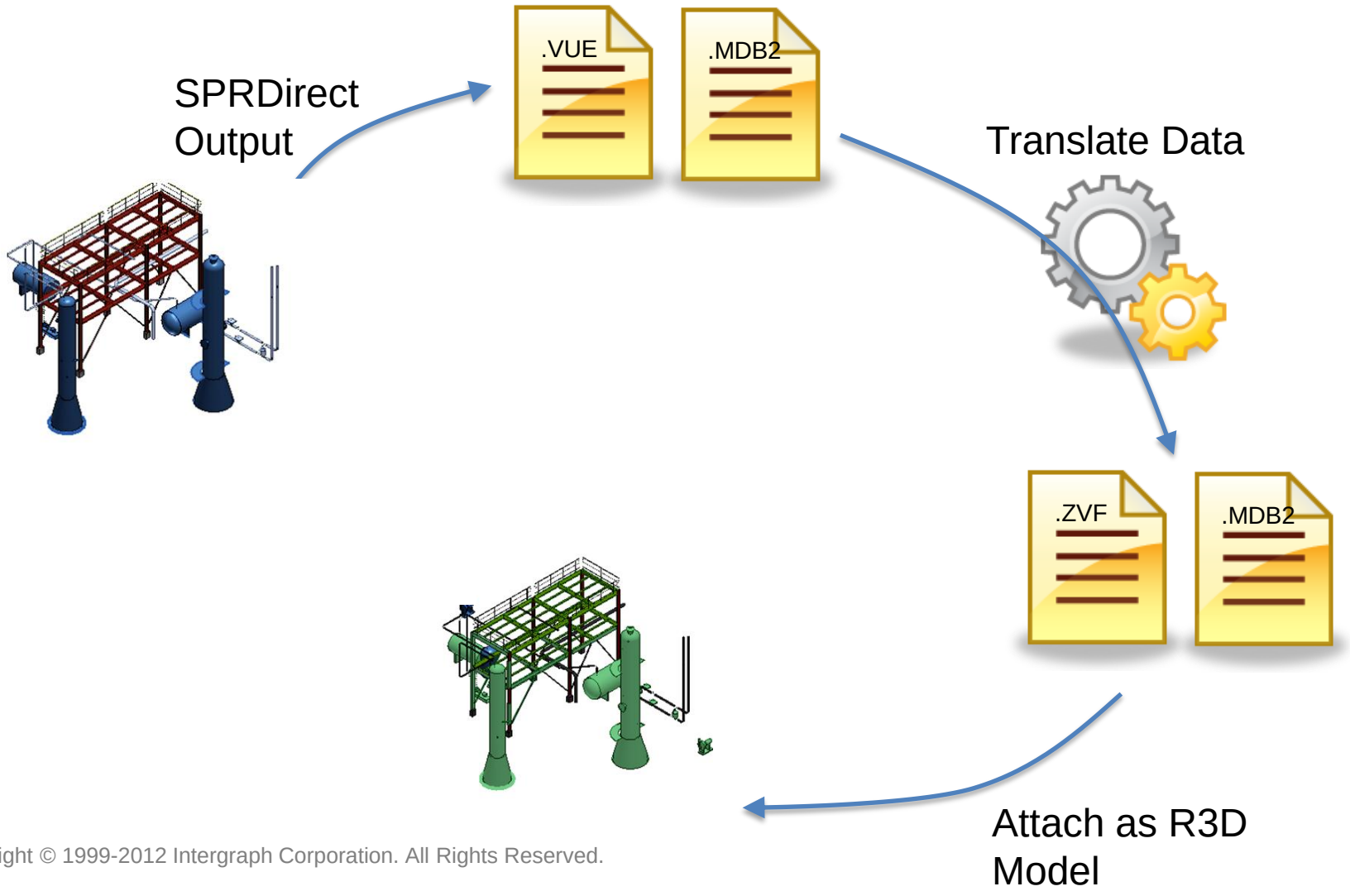
Sub Contractor
(Source Model)

Prime Contractor
(Target Model)

Reference 3D: SPRDirect Output

- Allows to publish Smart 3D reference objects (DGN/DWG, PDS) to Graphic (VUE) and label data (MDB2) files
- Files can be opened in SmartPlant Review or using Reference 3D.
- Easier and Faster way to get Smart 3D project to SPR where you can interactively review and analyze 3D model data.

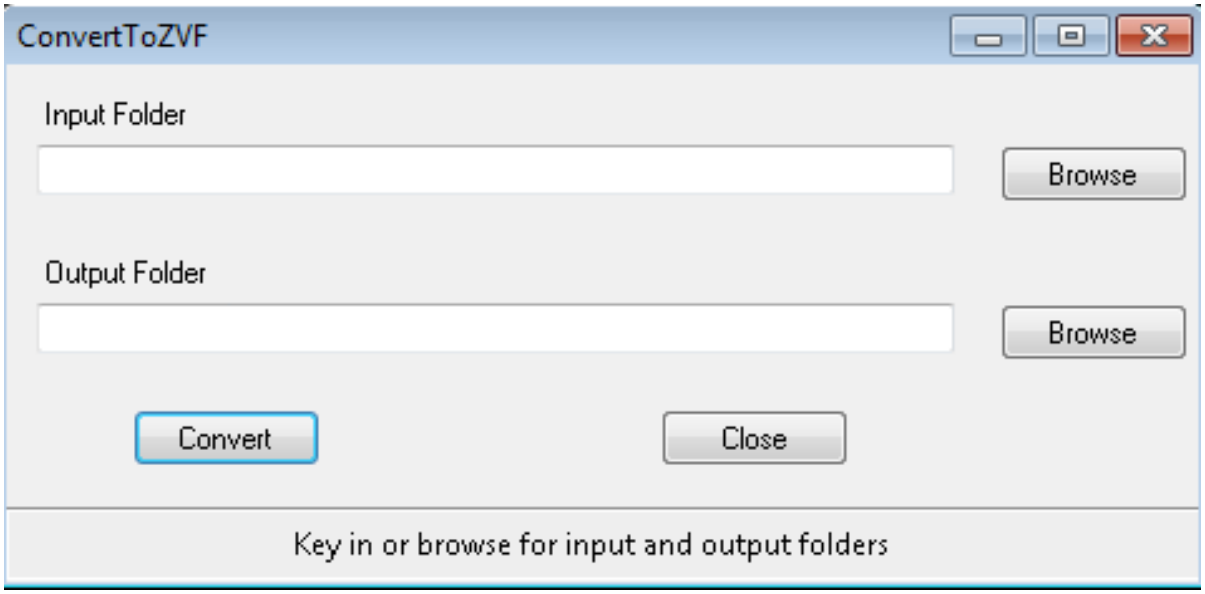
Reference 3D: Attaching SPRDirect Data



Reference 3D: Convert to ZVF

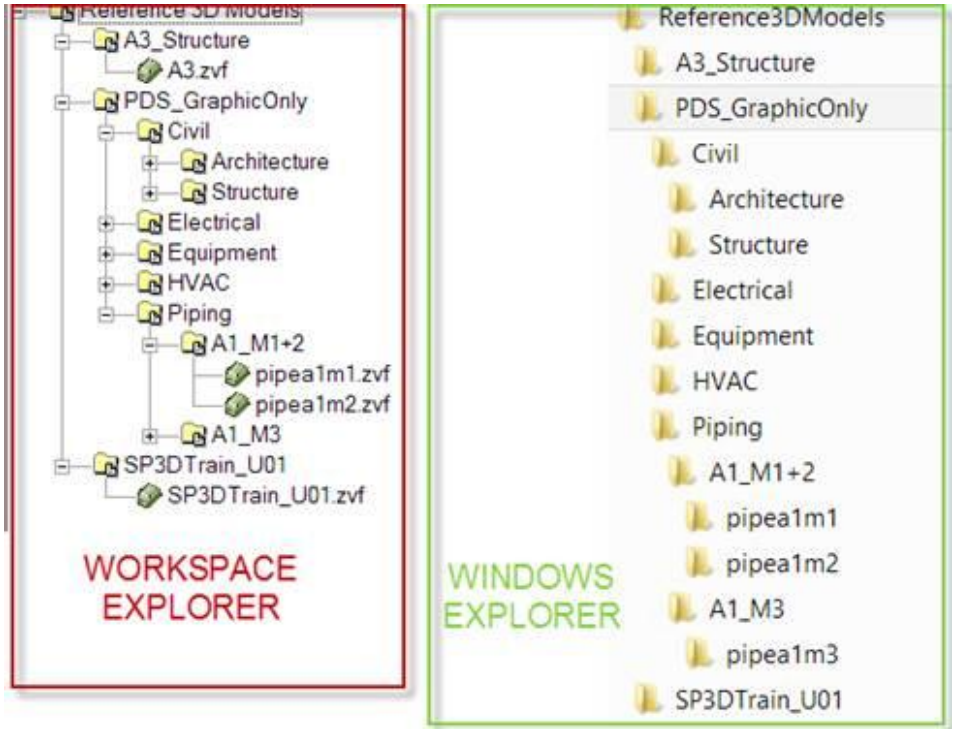
- **ConvertToZVF.exe** utility is delivered out of the box and can be found at the following location;

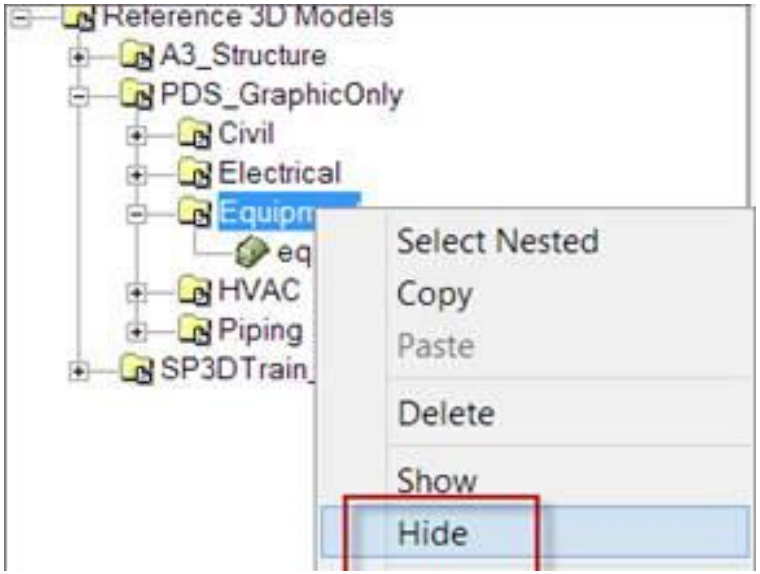
  ..\Core\Tools\Administrator\Bin



Reference 3D: Create Folder Hierarchy

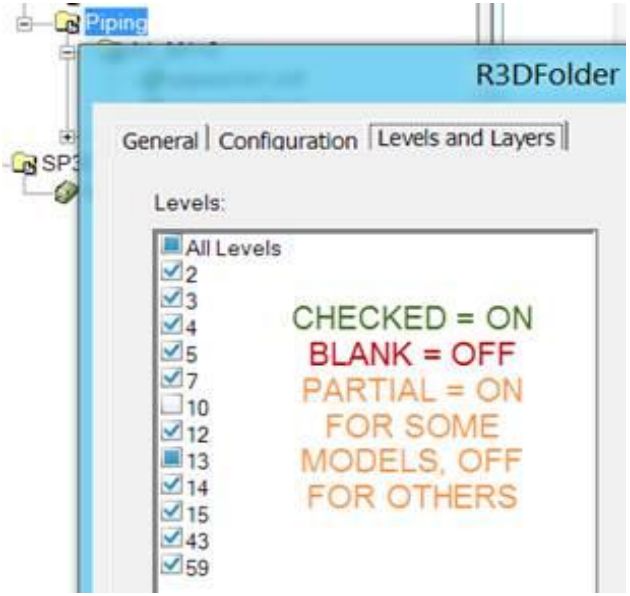
- If there is folder hierarchy on disk below the root folder of the R3D attachment, this folder hierarchy is automatically reflected in the WSE without having to do anything extra in S3D





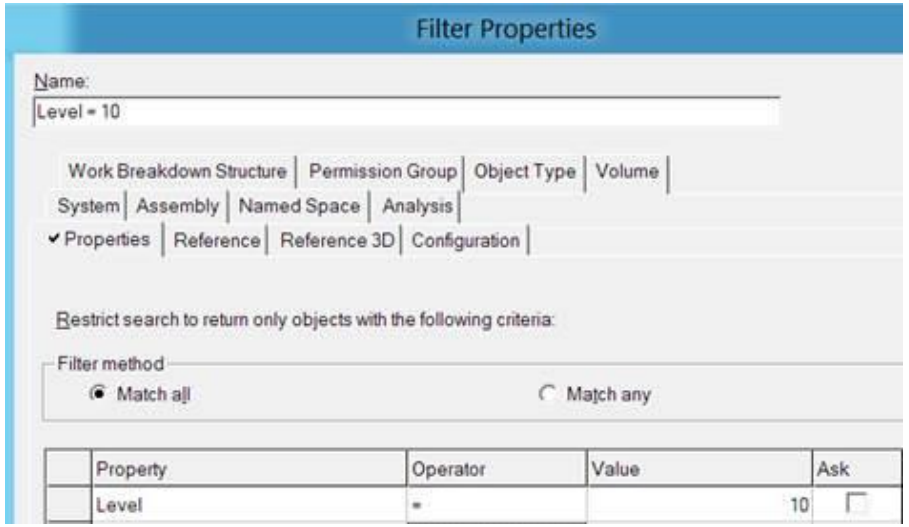
- Hide and show command works at any level in this hierarchy in WSE to quickly hide and show the graphics in that branch

Reference 3D: Levels and Layers



- Filters can be defined based on Levels and Layers.
- Surface style rules can be created based on these filters which can be exported to SP Review.

- The properties page of the R3D model, folder or file shows the levels or layers and display can be turned on or off using check boxes.
- Surface style rules can be created based on Levels and Layers in the R3D model which can be exported to SP Review.



SETUP AND ADMINISTRATION LAB

Lab 27 - 31

Reference 3D: Business cases

- Some of the business cases provided by this functionality include:

Supporting Parallel Design for Increased Productivity

If a project has many similar units, only one unit may be modeled and published. This published unit can then be attached multiple times with the required positioning.

Additional modeling such as civil work can be performed simultaneously

Model Data Reuse functionality can be used to actually replicate unit across to obtain real S3D objects

INTERGRAPH BATCH SERVICES

Batch Services

- This functionality allows scheduling of regular, time consuming tasks through the Intergraph Batch Services application.
  - Database Integrity Command
  - Backup Command
  - Restore Command
  - Structural import
  - Structural export
  - Drawings and Reports update
  - Printing drawings
  - Updating multiple R3D models

SETUP AND ADMINISTRATION LAB

Lab 33 - 36

DATABASE CONVERSION WIZARD (SQL ⟷ ORACLE)

Database Conversion Wizard : Overview

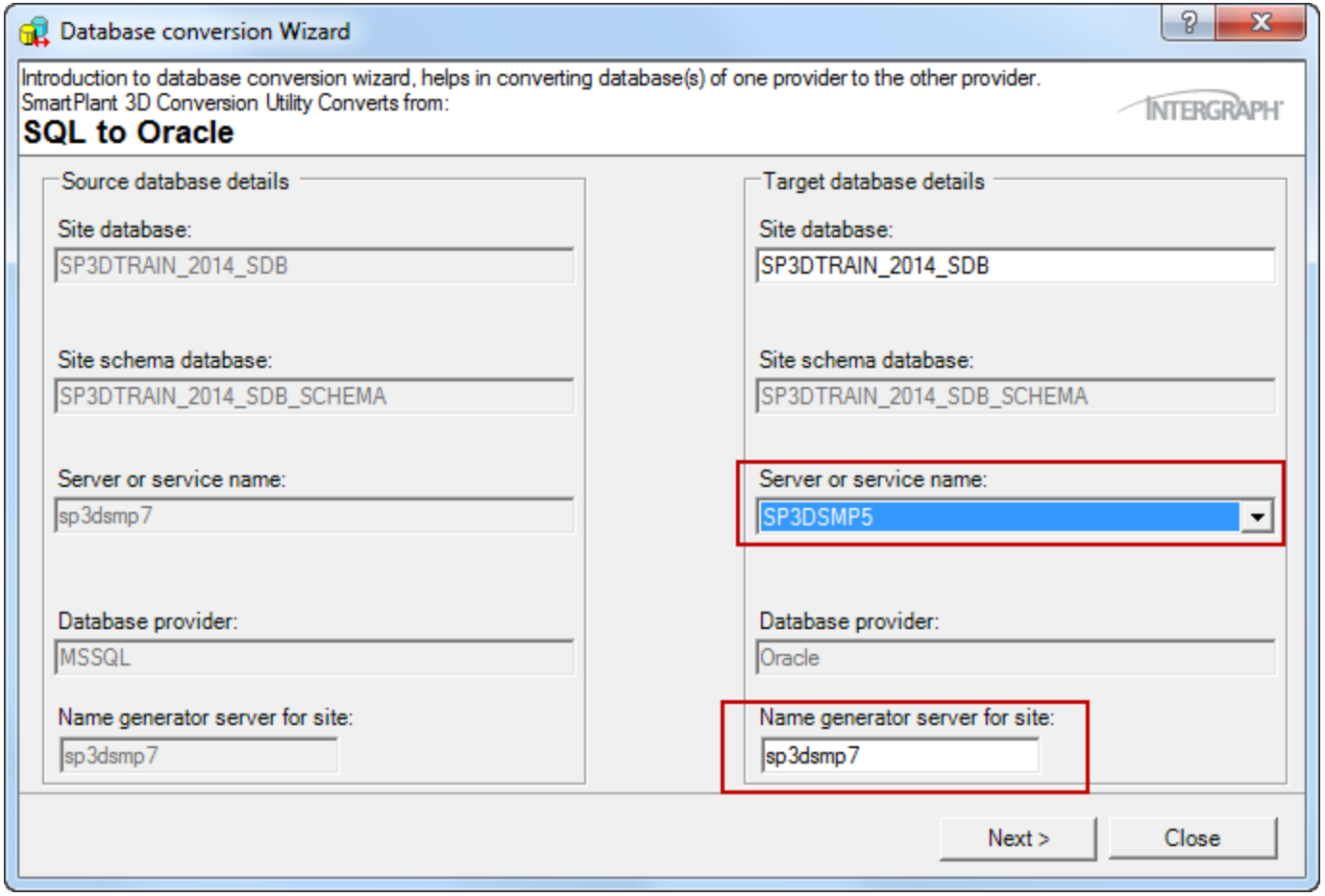
- Used to convert databases from SQL ⟷ Oracle
- Prerequisites:

- SQL and Oracle databases should be running.

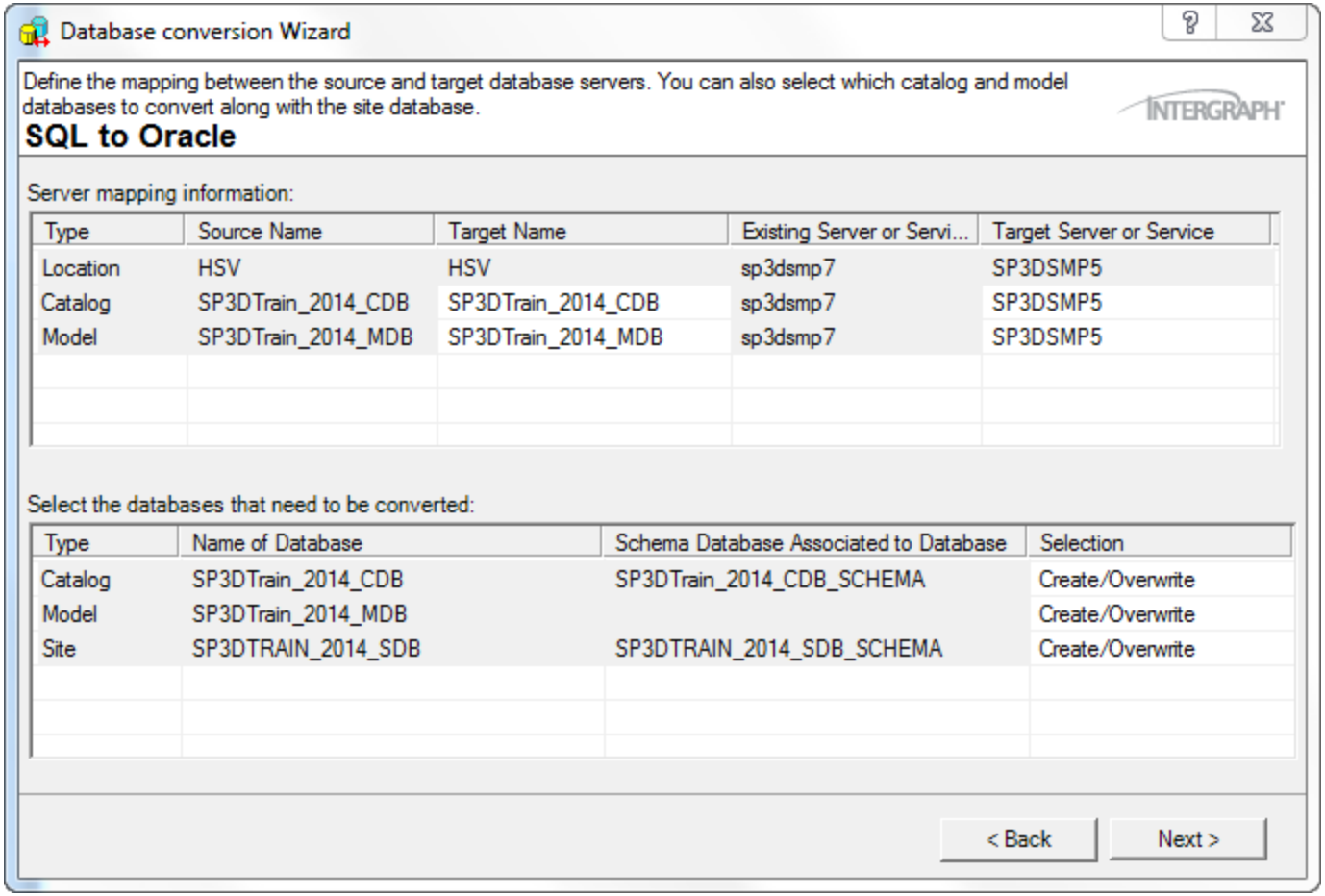
- Client machine needs SQL server registered and TNSNames entry for Oracle instance.

- This tool is only supported for Smart 3D databases (Plant mode).

Database Conversion Wizard



Database Conversion Wizard

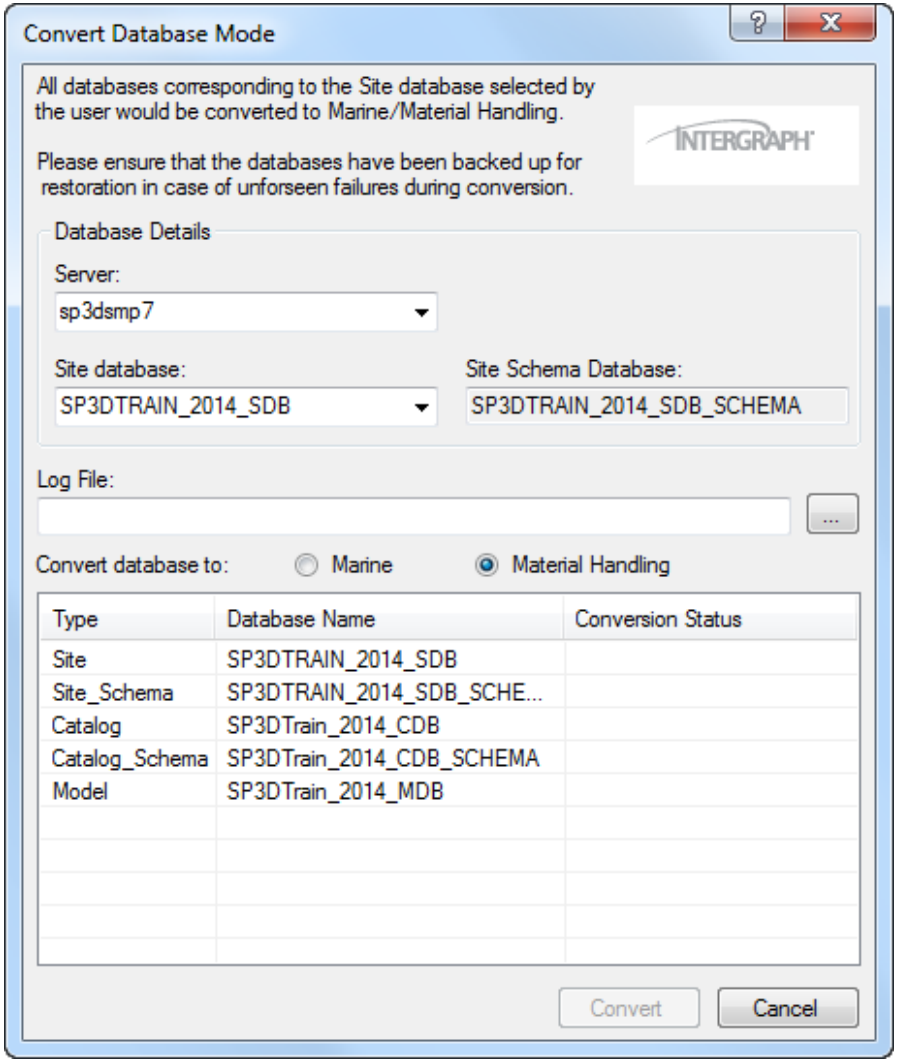


CONVERT DATABASE MODE
(PLANT TO MARINE OR MHE)

Convert Database mode

- Can be used to convert Plant database to Marine or MHE
- Currently only used for MSSQL databases.
- ConvertDatabaseMode.exe
- Location: InstallDir\Smart3D\Core\Container\Bin\Assemblies\Release
- Help guide ‘Smart3D2014R1_Plant_Marine_MHE_Conversion.pdf’

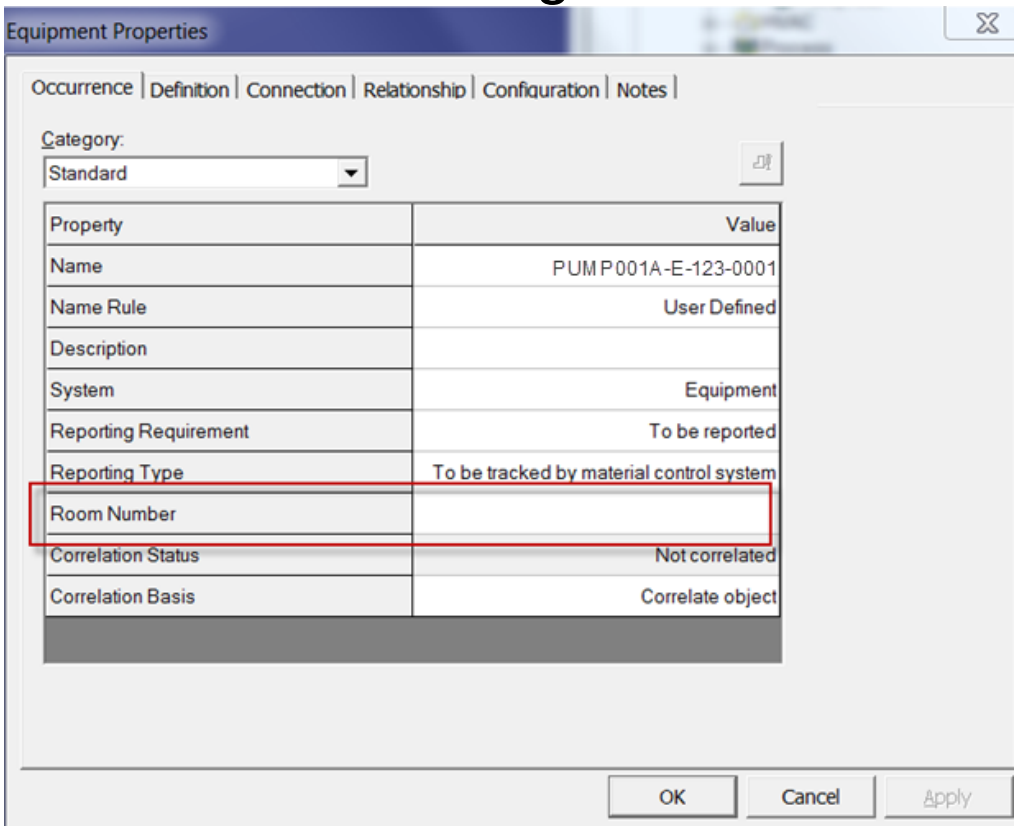
Convert Database mode



ADDING USER DEFINED ATTRIBUTE TO S3D DATABASE

Adding User Defined Attribute to S3D Objects

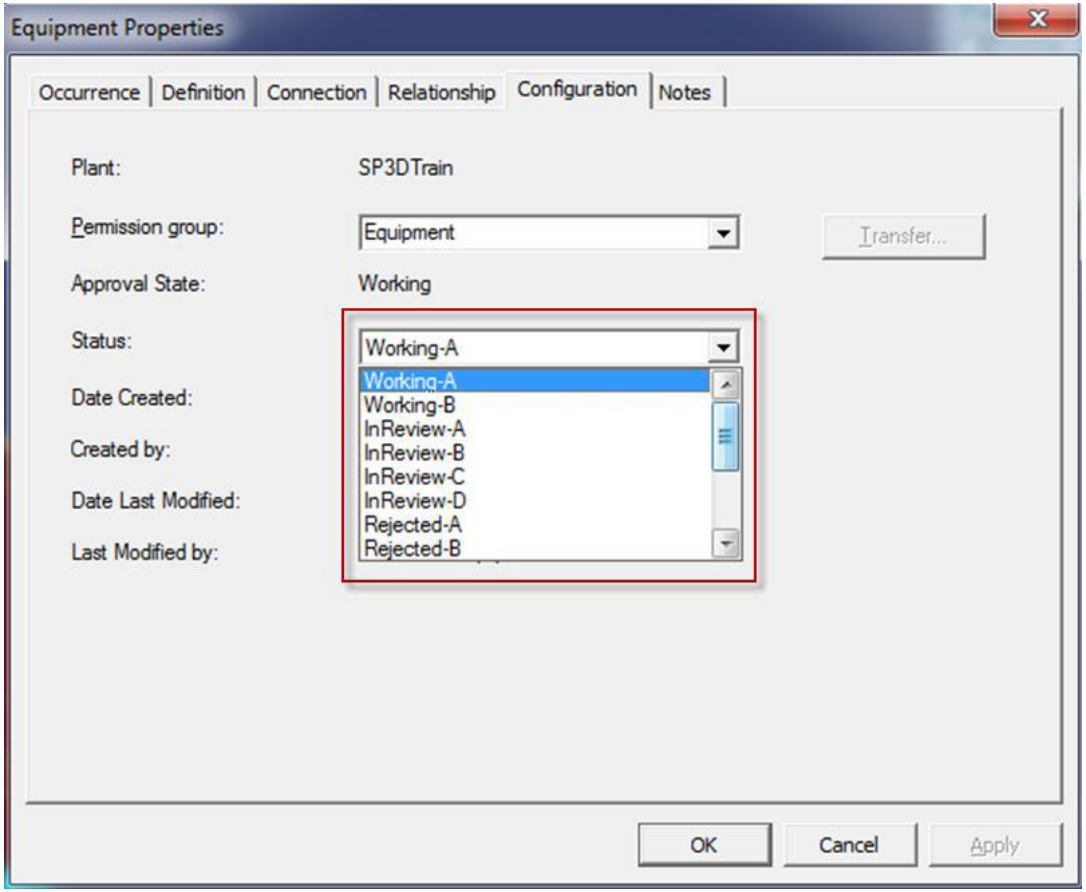
- A typical project requirement can be to have a common user attribute to S3D objects. This attribute needs to be bulkloaded into the S3D catalog.



ADDING APPROVAL STATUS IN S3D

Adding Approval Status in S3D

- Project administrators would like to add new approval reasons for S3D objects. These could be bulkloaded to the catalog using a codelist.



SETUP AND ADMINISTRATION LAB

Lab 35 - 37

PLANT VERSION UPGRADE

Plant version upgrade: Overview

- Database upgrades are required whenever there is a major change of software version (example from V2009.1 to V2011 SP1)
- Smart3D 2014R1 supports upgrade from following versions:

  - 2011SP1

  - 2011R1

- It is only possible to upgrade a plant configuration using the **same** database type (Oracle to Oracle or SQL to SQL).

Plant version upgrade: Workflow

- Backup plant and symbols
- Verify integrity of data
  - Verify/clean specifications
  - Synchronize model with catalog
  - Resolve To-Do list
  - Verify access to reference files
  - Run database integrity and clean corrupted elements
- Final backup with old version
- Install latest software to server and workstation machines

Plant version upgrade: Workflow

- Upgrade Site and Site schema databases using Database Wizard.

- Upgrade Catalog and Catalog schema databases using **Tools > Upgrade Version** command from Project Management.

- Upgrade Model database using **Tools > Upgrade Version** command from Project Management.

Plant version upgrade: Workflow

- Upgrade SharedContent
- Upgrade reference data
  - Customized catalogs
  - Non-Customized catalogs
  - Customized drawings and reports
- Synchronize upgraded model with upgraded catalog and resolve pending To Do list actions.
- Run database integrity and correct possible issues
- Regenerate reports database