Process, Power and Marine Division

SmartPlant 3D Global Workshare: Overview

Allis Jordan
June, 2009



INTERGRAPH

Getting to know your instructor.

INTERGRAPH

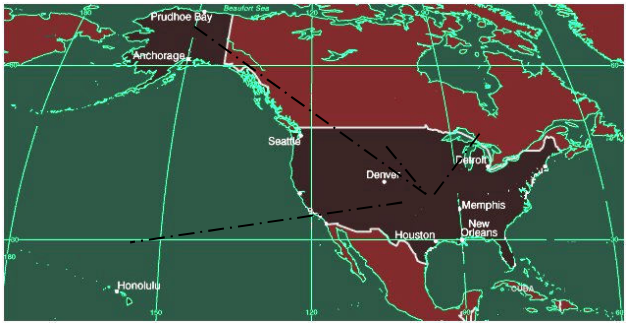
Allis Jordan

- Intergraph PPM SP3D V6, V6.1, V7, V9 Support
- Additional work and skills:
  - Master's Degree in Computer Engineering Specializing in Electronics from the University of Alabama in Huntsville.
  - Embedded Systems Programming, RADAR System Software Development, Application Development

What is Global Workshare Configuration (GWC)?

Workshare allows a single company to run projects from multiple geographical locations or for multiple companies in different locations to work on the same project.

In the SmartPlant 3D Global Workshare, data sharing between different locations will be achieved through model database replication of the entire plant to all satellite locations.



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What does GWC enable you to do?

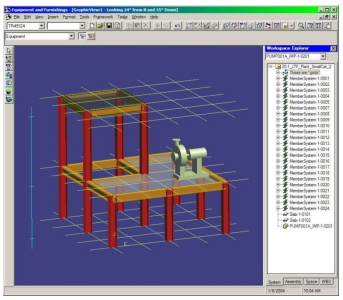
The intent of the GWC in SmartPlant 3D is to make the complexities of model sharing among remote locations transparent to the end user.

A live network connection between the satellites and the host is required for data replication, but work at the satellite and host locations can continue even when the network is unavailable.

Office A: Structure and Grids Placed.

Office B: Equipment placed on the Slab from Office A.

Office A & B see combined work.



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What will be covered in this training?

INTERGRAPH

Overview:

- Planning for GWC
- Creating the SP3D GWC
- Administrating the SP3D GWC
- Permission Group Transfer
- Consolidating the GWC
- Discuss Backup and Restore Workflows for the SP3D GWC
- Changes and Future Considerations

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SmartPlant 3D Global Workshare: Planning

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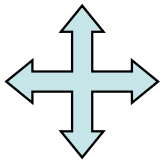
June 2009



INTERGRAPH

Common Terminology Items



Geographic Location
SmartPlant 3D Location
Location Object

Participating Computers:

- Host Server
- Satellite Servers
- Workstations

2

Location. Location. Location.

Geographic Location **– the physical office, or approx. location such as Houston, Oslo, or Timbuktu**

SmartPlant 3D Location **– Referred to as the Host Location, the Satellite Location, or Host Server, Satellite Server, or directly by the Name value given to the Location object handling the Host or Satellite Server.**

Location object **– An object that is comprised of the a Name, Name Rule ID, and Server Name. The Location object is created by the user an provides a way to identify the Server and provide a Unique component to the name rule for objects created at that SmartPlant 3D Location.**

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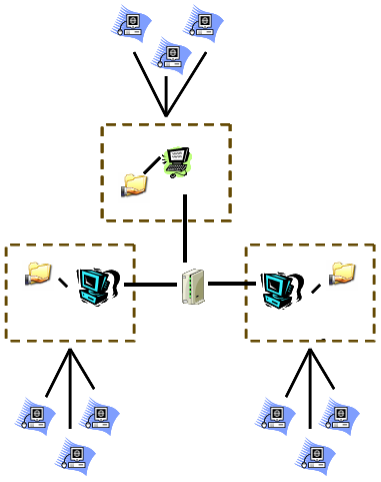
Participating Computers



- Host Server
- Workstations and Administrators
- Satellite Server
- Symbol Shares per Office
- LAN/WAN connection

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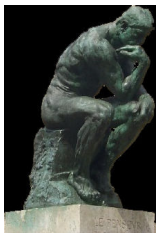
Planning for GWC



Identify all participating geographic locations.

Identify work divisions per locations:

- Administration and Reference Data @ Location 1
- Piping @ Location 4
- Structure and Equipment @ Location 1 and 2
- Output @ Location 3, etc…

Procure SP3D Server machines at each geographic location

Ask and answer the right questions (next slide)

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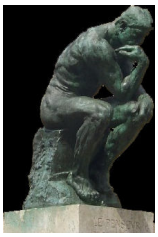
Planning for GWC (cont'd)



Where is the Host Server going to be located?

How many Satellite Servers will there be and where will they be located?

Can all Servers resolve the short or long name of all the other Servers?

Is there a firewall/security infrastructure in place that "helps" instead of "hinders" the SP3D GWC?

Is another experienced GWC person going to be available at the Satellite offices to perform Satellite specific tasks, or has remote machine access been established?

What Bandwidth, Latency, and Quality of Service exists between the Host and Satellites? – looking for red flags

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SmartPlant 3D Global Workshare: Administration, Modeling, and Generating Output in the GWC

Allis Jordan
June 2009



INTERGRAPH

Topics

INTERGRAPH

- Administration
- Catalog Changes
- Modeling
- Generating Output

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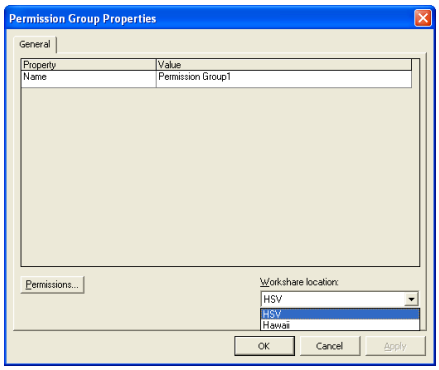
SmartPlant3D Global Workshare: Administration

INTERGRAPH

Administration – Permission Group Management

INTERGRAPH

- **Permission Group creation must take place while working against the Host.**
- **Permission Groups are defined as location specific during the creation.**



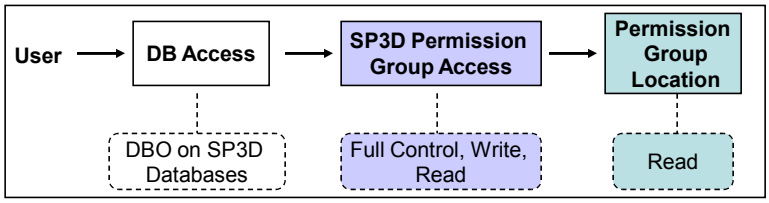
Location list is populated by the location objects used during the creation of GWC.

Administration – Effective Permissions

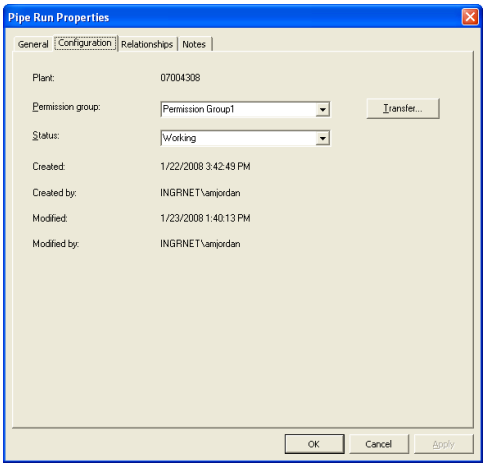
- Users not working at the location that the permission group is defined at will only have read access to the permission group. The following table holds:

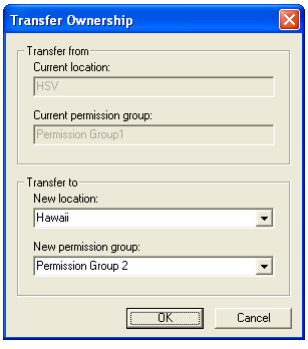
	Defined Permission	@ Location A	@ Different Location
Permission Group @ Location A	**Full Control**	**Full Control**	**Read**
	Write	**Write**	**Read**
	Read	**Read**	**Read**

Updated User Permission Check:



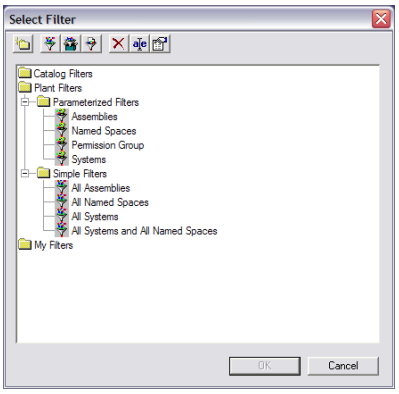
Administration – Object Transfer Between Locations





Administration – Filter Creation and Utilization

- •Filters and Filter Folders are objects associated to permission groups (just like an equipment item or a pipe part).
- • All Filter and Filter Folder creation, modification, and deletion generally takes place working against the Host.
- • You may transfer Plant Filter Folders to the Satellite Locations, then users at
- • Then Satellite may create Plant Filters.

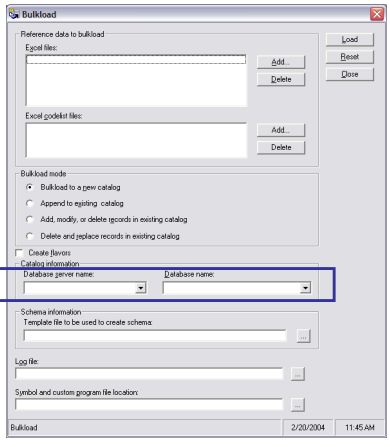


Administration – Reference Data

All Reference Data modification must be performed while working against the Host Catalog and Catalog_Schema.

Utilize the Bulkload Utility to perform such changes.

Remember, if changes are made that require the regeneration of the Report Database (such as the creation of a new part class, addition of a property or interface, etc) then the Report Database at all Locations will need to be Regenerated: not just the Host.



Host Server and Catalog Database

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Catalog Changes

INTERGRAPH

Catalog Changes - Overview

INTERGRAPH

The majority of catalog changes will be propagated in the GWC

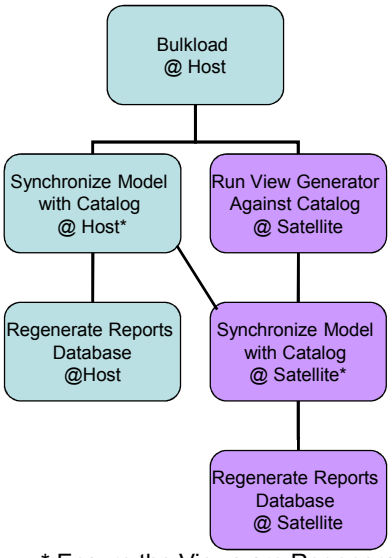
The workflow on the right must be conducted on the Host and **all** Satellite Servers when bulkloading in a GWC

- This workflow will regenerate what is not propagated to the Satellite

Once this workflow is completed, the workshare will again be in a synchronized state

Intergraph does not recommend overwriting the Satellite catalog with a copy from the Host and linking it to the Model

- There is nothing gained from doing this.
- The chances of breaking the workshare are increased

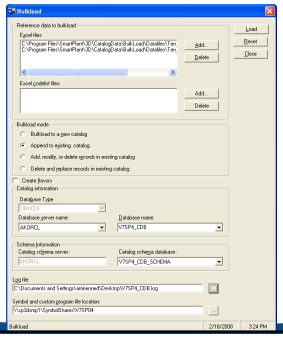


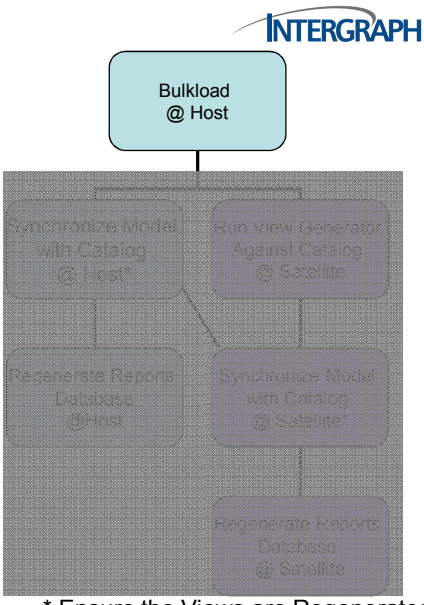
* Ensure the Views are Regenerated

Catalog Changes

Bulkload @ Host

- Updates
  - Catalog Tables
  - Catalog Views
  - Catalog Stored Procedures
- Database views do not participate in a SP3D GWC



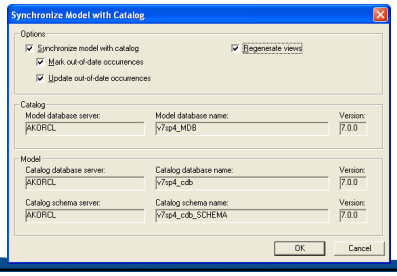


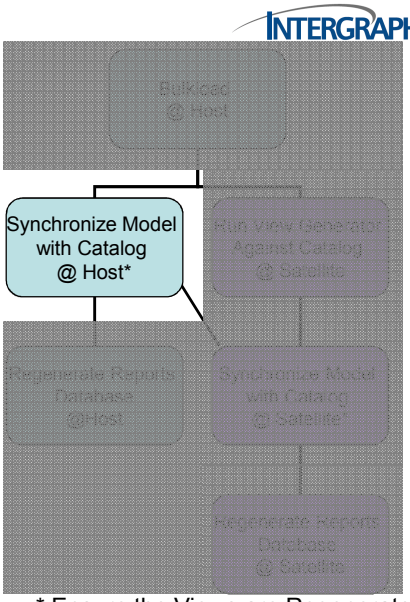
* Ensure the Views are Regenerated

Catalog Changes

Synchronize Model with Catalog @ Host

- *Ensure that the views are Regenerated*
- Updates the table content and the views on the Model
- If object is owned by Host
  - Object will be updated
- If object is owned by Satellite
  - Object will be flagged for update, and if a TDL record is necessary then one will be created





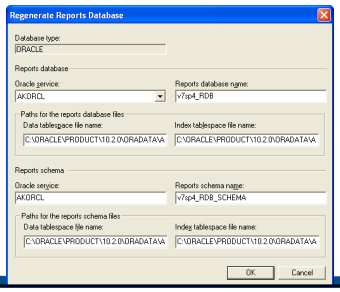
* Ensure the Views are Regenerated

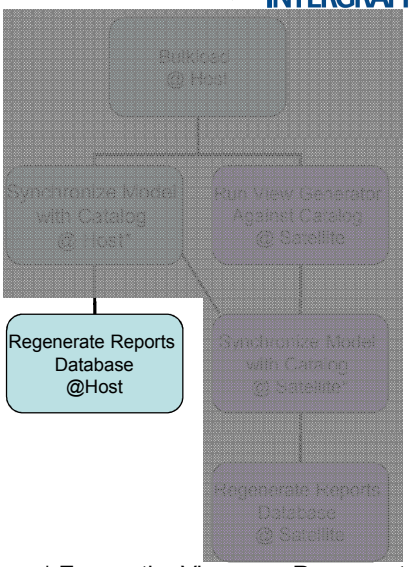
Catalog Changes

Reports Database is a set of views that point to data in other databases, and must be kept up-to-date

Regenerate the Reports Database @ Host

- Updates the views at Host only
- Keep in mind that the Reports Database does not participate in workshare



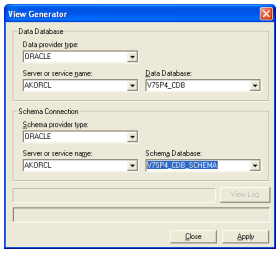


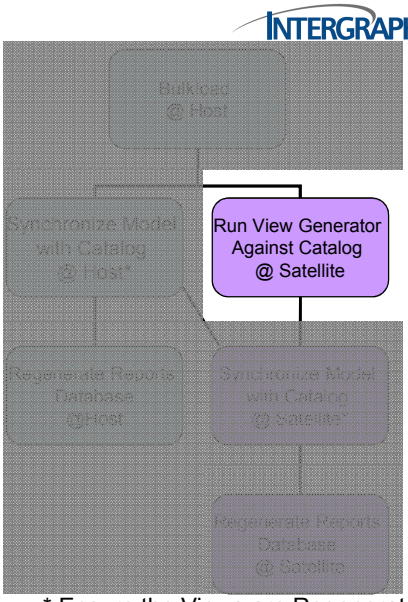
* Ensure the Views are Regenerated

Catalog Changes

Run View Generator Against Catalog @ Satellite

- This must occur after replication has propagated changes from Host to Satellite
- Catalog Views will be out-of-date
  - Bulkload only updated views at Host



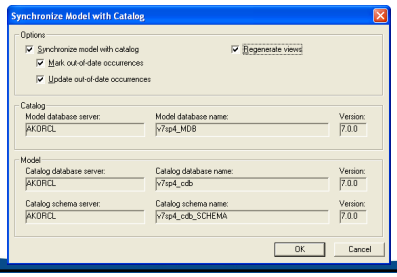


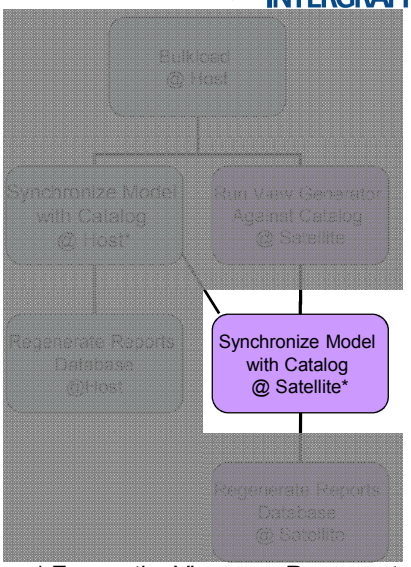
* Ensure the Views are Regenerated

Catalog Changes

Synchronize Model with Catalog @ Satellite

- *Ensure that the views are Regenerated*
- Updates the table content and the views on the Model
- Object is owned by Satellite
  - Object will be flagged for update, and if a TDL record is necessary then one will be created



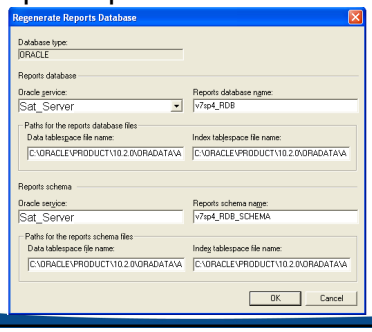


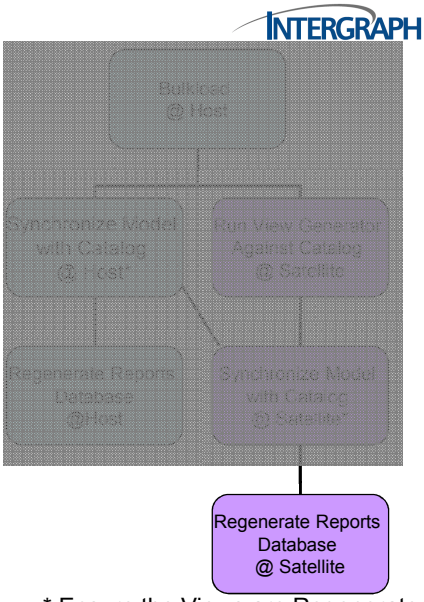
* Ensure the Views are Regenerated

Catalog Changes

Regenerate the Reports Database @ Satellite

- Updates the views at respective Satellite only
- Keep in mind that the Reports Database does not participate in workshare





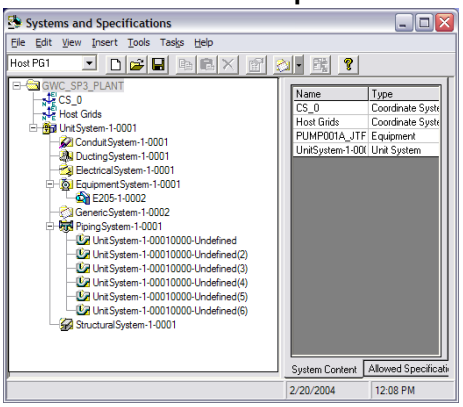
* Ensure the Views are Regenerated

Modeling – Systems and Specifications

Systems can be created at any location. Modifying/Deleting a system can only be done if the system was created at the same location you are working at and you have write or Full Control to the permission group that the System belongs.

Some special features exist for systems:

Child Systems can be created under systems that were created at a different location. This act of making a child relation (for the purposes of systems) is not restricted in the GWC the way other modifying actions are typically restricted.



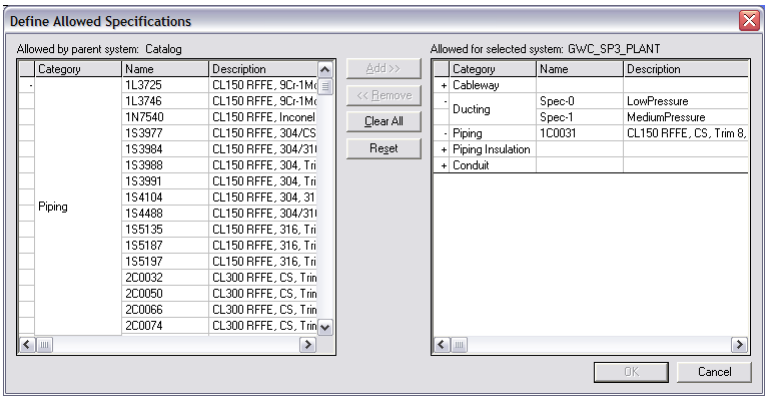
Modeling – Systems and Specifications

Implied Permissions

- A concept introduced with Global Workshare.
- If a user attempts to modify an object from a location, other than the location where that object resides, that user will be granted access **if and only if** that user has write permissions to the permission group in which the object resides (at the remote location).
- Example:
  - Consider a Workshare with two locations: Houston & London
  - You create a system called “Pipe Rack 100” in a Permission Group located in Houston
  - John, who works in London, has write access to the Houston Permission Group in which the system “Pipe Rack 100” is located
  - John can add columns, beams, and braces, etc because he has write access to the Permission Group located in Houston (this is using implied permissions)
  - However, John cannot delete or change any of the properties of the system “Pipe Rack 100” because it is owned by Houston, and he is working from London
  - If John traveled to Houston, and logged on there, he could delete or change any of the properties of the system “Pipe Rack 100” because Houston owns this system.

Modeling – Systems and Specifications

Specifications must be added to the Plant from the Host Location, after the specifications have been added to the Plant (and subsequently propagated down to all children systems) the child systems can have specs removed or re-added by the appropriate user at the corresponding locations.



Modeling – Systems and Specifications

Available Specs must be added at the Host location

- At the Host, in the Systems and Specifications Task, Set the focust to the root.
- Then click “Define Allowed Specifications”
- Select the desired specifications for the system you have selected

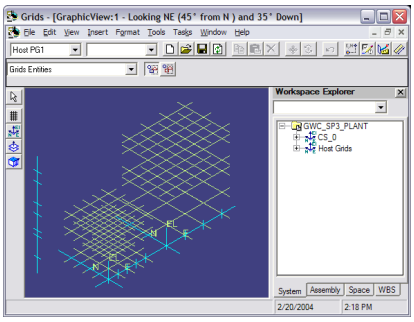
Parent system must have specification allowed before a child system can use it.

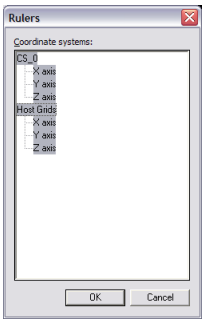
When you add or remove a child, you are modifying the parent. Thus you must have write access to the parent.

For example, to create a pipe run, you need write access to the parent pipeline. However, you do not need access to the system to which the pipeline belongs.

Modeling – Grids

The Grid Wizard and associated Grid environment commands function as normal. Grids can be placed at the Host and Satellite as normal. Rulers can be used in the workspaces of any workstation regardless of whether those rulers were created at the same location or at a different location. Also, relationship (such as the mate relationship when placing an equipment) can be established between the plane and the equipment even though the equipment item and the plane may have been placed on different GWC Servers.

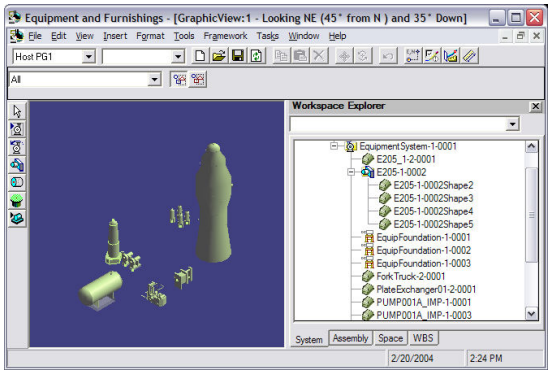




Modeling – Equipment

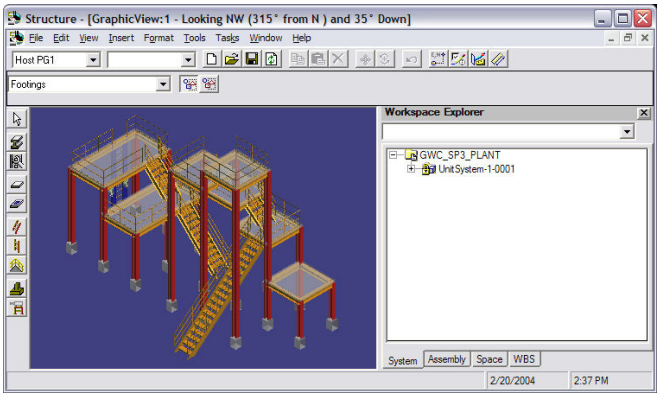
Equipment commands function as normal. Equipments can be placed under any system that the user would normally be able to place them under.

The only additional GWC consideration is: a designed equipment item and its children (ports, shapes and any standard equipment that is a child of the parent designed equipment) must be placed at the same GWC Server.



Modeling – Structure

Structure functionality is the same at the Host and the Satellite. However, there are some things that can be done that may not be obvious, such as creating the members at one location and adding the assembly connections at another.



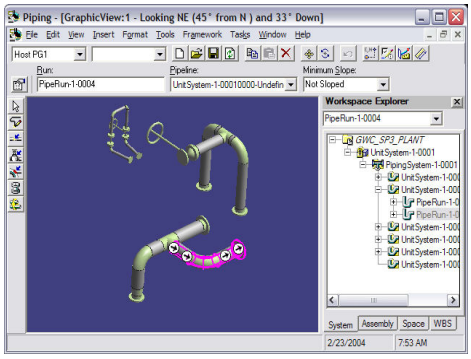
Modeling – Piping

The PipeLine System serves as a parent to Pipe Runs.

A New Pipe Run can be created under a Pipeline System independent of location.

But in order to model in a Pipe Run, it had to have been created at the same location.

- The impact of this is that the only way two locations can work off the same pipe component is if the port being connected is a "free port" that is, the port does not already have a feature defined that belongs to a pipe run. An example of such a port is the third port of a Tee. The third port can be routed off of since this action creates a new pipe run at the user's location.



Modeling – Piping

Modeling across SP3D GWC Locations, without Implied Permissions

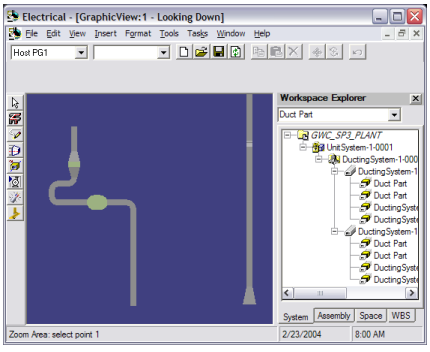
The Double-Hand Shake Method will allow a user without write permissions to the Permission Group at a remote location to create a relationship to objects in the model belonging to that remote location.

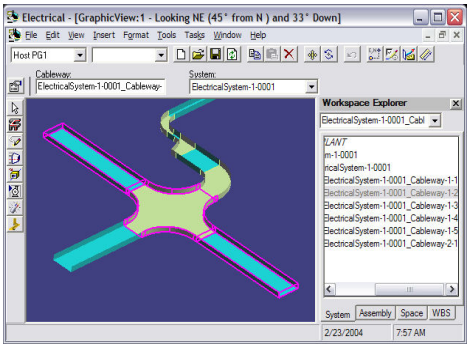
Double-Hand Shake Method Example

- UserA places a pipeline at LocationA
- UserB routes a pipe into the LocationA pipeline at 90 degrees from LocationB
- SP3D attempts to place a Tee, but cannot because User2 does not have write permissions to the pipeline at LocationA
- SP3D places a ToDoList entry at LocationA for the Tee to be accepted
- UserA accepts the Tee, but now a cut-back must be performed on the header pipe.
- SP3D places another ToDoList entry at LocationB for the cut-back to be performed
- UserB accepts the cut-back.
- Tee is completed placed

Modeling – Other Route Environments

Other route environments Electrical and HVAC apply the same guidelines as Piping. If the port is truly “free” and not belonging to a run at a different location, then you can route off of it.

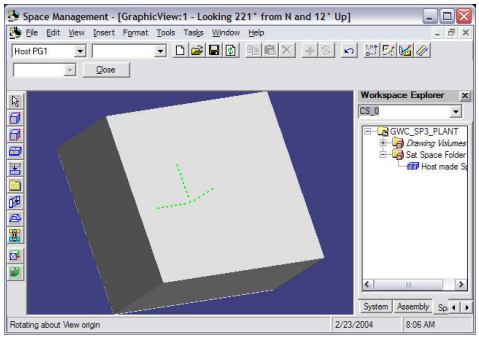




Modeling – Space Management

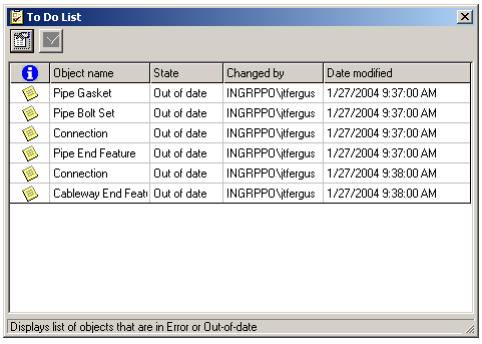
Interaction with spaces created at other locations is through the standard read-only privilege set common in GWC.

Spaces can be placed under space folders created at other locations.



To Do Lists

When interacting with Objects placed at other locations, dependencies or relations will be created. When modification of a related object occurs at one location, then objects at other locations that share in that relation cannot be updated at that time. A To Do List entry will be created, and can be updated at the Location that has write access to the object.

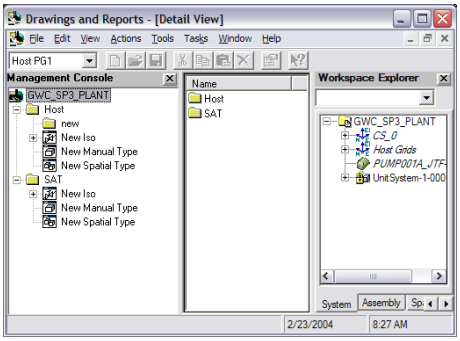


Output – Drawings Hierarchy

The Drawings and Reports Task Hierarchy has some special GWC considerations.

- Any location can create a folder immediately below the Root Node of the tree.
- This is the start for a location specific branch that can contain all of the various types supported by the Drawing and Reports Hierarchy.

The content of drawings and reports is based on the query set for the drawing and report. It is not restricted based on location (unless the user so defines the query).

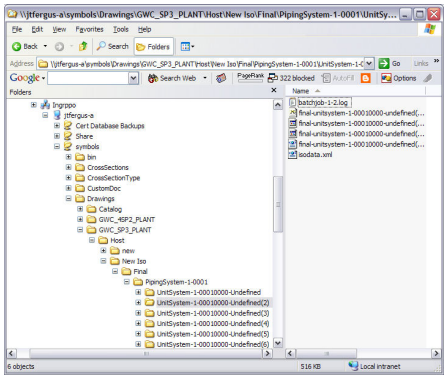


Output – Symbol Share

The symbol share's Drawing folder contains the file based content that corresponds to the Drawings hierarchy.

As with a non-GWC setup, if the symbol share access is not write, then the user is restricted from performing work on the Drawings and Report hierarchy.

If users need to read/view the files created at other locations, then the entire set of symbols shares will need to be synchronized.



Host/Satellite Project Management Functionality

Project Management Action	Host	Satellite
Run Duplicate Plant for Workshare Command or the Consolidate Command	Yes	No
Create Permission Group	Yes	No
Create Permission Group Folder	Yes	No
Add Users or Groups to Permission Group	Yes	No
Modify User or Group in Permission Group	Yes	No
Change Symbol Share for Catalog	Yes	Yes
Regenerate Report Database	Yes (for Host)	Yes (for Satellite)
Add new properties to the object types	Yes	No
Create Location Object	Yes	No
Run Sync Model with Catalog	Yes (for Host)	Yes (for Satellite)
Database Detect IFC	Yes	No
Bulkload to Catalog DB	Yes	No

Host/Satellite – General Functionality

General Action	Host	Satellite
View Catalog Data in Catalog Task	Yes	Yes
Use any of the Commands in the Equipment, Electrical, Common, Drawings and Reports, Grids, Hangers and Supports, HVAC, Piping, Piping Manufacturing, Space Management, Structure, Systems and Specs environments.	Yes	Yes – with a few exceptions that we have covered, like adding specs to the plant node.
Create/Modify/Delete Objects under any system created in Systems and Specs provided they have effective write access to the object being modified.	Yes	Yes
Create/Modify/Delete new branch in the Drawings and Reports task hierarchy.	Yes – provided they have write access to the symbols share	
Create/Modify/Delete object under the location specific drawings branch.	Yes – provided they have write access to the symbols share	
Create/Modify/Delete Filters/Filter-Folders	Yes	Depends on prep.
Create View Styles	Yes	Yes

Process, Power and Marine Division

Questions and Answers



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