Context
- Established Intergraph PP&M Conversion Centers;
  - China & India

Status
- Growing interest & adoption within PDS user community
- Completion of Medium-Size PDS to SmartPlant 3D conversion project (geometry, specs. & reference data)
- Maturing/ Evolving Conversion & Validation Tools combined with updated work processes

Future Expansion Areas
- Continued improvement/ refinement of conversion processes, workflows & validation tools
- Progressive Adoption of Xmplant during 2008/09 to support SmartPlant 3D/SmartMarine 3D & external Plant Design System Interoperability
PDS -> SP3D Translation Process

1. PDS Spec & Catalog Data
2. Spec Translation
3. Translated PDS Spec & Catalog Data
4. Translation Rules
   Model code map etc.
5. SP3D Catalog & Model
6. Validate
Translation Process

Process, Power & Marine

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Multiple 3D Model Data Interoperability

3D Plant Design

SmartPlant 3D

Intelligent Orthographic Drawing Production

SAT 3D Models

Referenced PDS 3D Models

MicroStation 3D DGN Models

Converted PDS 3D Models

PDMS 3D Plant Models

PDMS Model Visualization

Process, Power & Marine
What is Global Workshare

- 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.
- 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.
Underlying functionality provided by Database Vendors. SQL Server provides transactional replication and Oracle provides streams based replication.

SmartPlant 3D interaction with database is based on transactions. This transactional processing of commands makes a natural fit for today’s database replication technologies.

SmartPlant 3D has built in conflict avoidance and handling capabilities such as permission groups and To Do List mechanisms.

SmartPlant 3D also has change propagation mechanism through relationship engine.

Worksharing by nature require these mechanisms. This is how users at each location do not step on each other’s work and also respond to changes done by other teams.

SmartPlant 3D automates the setup through creation of scripts for setting up database replication.
SQL Server

Publisher

Artists

Publication

Distributor

Log Reader Agent

Distribution Agent

Subscriber

Artists

Subscription

Oracle

Source Database

Record Changes

Capture Changes (Local)

Capture Process

Enqueue LCPs

Capture Database

Queue

Destination Database

Queue

Dequeue LCPs

Apply Process

Apply Changes

Database Objects

* Capture database may be source database, destination database, or a third database.
Working in GWC - Infrastructure

- Database Servers
  - GWC Configuration requires Enterprise Editions of SQL Server or Oracle
  - Servers function as both database server for local clients and distribution server to exchange data with other servers in workshare configuration.
  - Servers must be sized not only for concurrent number of local users but also to account for incoming data from other locations.

- Client Workstations
  - No special configuration requirements due to Workshare

- Network
  - Typical WAN configurations involving one or more T1 or T3 lines seems to meet the requirements for large number of concurrent users.
  - Database Replication is designed to be auto-regulated, in other words bandwidth usage is kept well below the bandwidth provided by the network. Result is no disruption or impact to existing applications/traffic over the network due to addition of workshare configuration.
  - Latency and Bandwidth may increase time it takes to transfer changes. However typical timings are in seconds, so even with delays it would be better than legacy systems.
Working in GWC - Modeling

- Most modeling tasks do not have any impacts while using workshare. Some of the special functional points are discussed below.

- **Piping**
  - Double Handshake Mechanism for creating branch connections.
  - To Do List entries created for creation of implied items such as welds, branch components.

- **Systems & Specifications**
  - Special handling of systems to be able to create objects within systems that belong to another site.

- **Structure**
  - Ability to place assembly connections (cutbacks etc) on the structure placed at another site.

- **Clash Approval**
  - Currently only at host location however V2008 provides ability to approve clashes at any location.
- Access Control managed at host only. Permission Groups created and maintained at host.
- Catalog managed at Host.
- Initial Setup starts at Host and replicated to satellite locations.
- Host controls who the addition/deletion of locations (site) participating in the workshare.
Working in GWC – Catalog

- Catalog can be edited at host only
- Since Catalog is shared between all disciplines and also for other project data such as reports, labels, iso options etc, changes need to be managed.
- If catalog expertise is spread across locations then custom solution can be implemented.
Integrating the Engineering Enterprise…
SmartPlant 3D 2008
Migration and Interoperability
Richard Smykay

21-22 August 2008
Hilton Opera Hotel
Hanoi, Vietnam