Distributed Services & Distributed Pro/BATCH

May 2010
Rev I
Distributed Services - Overview

> Modular Set of Applications
  – Client and Server Components
    • Example: Distributed Pro/BATCH

> Distributed Computing Environment
  – Computing resources connected via a network
  – Centrally managed and administered

> Communication Protocols
  – Open, web standards based
    • XML/SOAP (Simple Object Access Protocol)
    • HTTP
Distributed Services - Benefits

> Increase personal productivity
  – Increasing access to networked computing resources

> Increase enterprise productivity
  – Providing more products in the same time

> Improve product quality
  – Support a more iterative product development process

> Reduce time to market
  – Enabling simultaneous development on multiple machines

> Increased Return On Investment (ROI)
  – Leveraging and optimizing IT investment
    • Hardware
    • Software
> Key Capabilities
   - Extensive set of data interfaces supported
     - 2D and 3D (Export and Import)
     - Image formats (JPEG, TIFF, BMP …)
   - Batch execution of ModelCHECK
   - Plotting and Printing

> Dual Operational Modes
   - Standalone (free with any Wildfire series release)
     - Local session of Pro/ENGINEER Wildfire
   - Distributed (via Distributed Services Manager)
     - Multiple remote sessions of Pro/ENGINEER Wildfire to process jobs

> Benefits
   - Optimize usage of network computing resources
   - Broaden organization’s access to Pro/ENGINEER
   - Improve user productivity by offloading tasks to remote resources
Distributed Pro/BATCH – Client Features

> Stand-alone application
  - Independent of Pro/ENGINEER
  - Creates and submits batch jobs
  - Retrieves results
  - Interactive and command line interface

> Multiple platforms supported
  - Win32, Win64, UNIX64

> Intuitive graphical user interface
  - Drag and drop capability (Windows)
  - Color coded job status

> Multiple operational mode support
  - Standalone, Distributed

> Schedule batch jobs
  - Useful for standalone mode
> Specify configuration files
  - Pro/ENGINEER config.pro
  - ModelCHECK configuration files
  - Plotter Configuration Files (PCF)

> Batch processing instructions
  - Default XML-based “templates” for batch tasks installed with client
    • Customizable to suit specific task requirements

> Re-use batch tasks in “dbatch” file
  - Settings saved
    • Task objects
    • Configuration files
    • Output directory
    • Distributed (DSM to send tasks to) / Standalone (local)
### Export Formats

<table>
<thead>
<tr>
<th>Format</th>
<th>Type</th>
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<tbody>
<tr>
<td>CGM</td>
<td>Medusa</td>
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<tr>
<td>DWG</td>
<td>JPEG</td>
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<tr>
<td>DXF</td>
<td>PDF</td>
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<td>IGES</td>
<td>STEP</td>
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### Import Formats

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</tbody>
</table>
3D Interfaces

Import Formats

> Export Formats
- ACIS
- CADD5
- CATIA Facets
- CATIA V4 & V5
- IGES
- JPEG
- JT*
- Neutral
- VRML

> Import Formats
- ACIS
- CADDS5
- CATIA Facets
- CATIA V4
- CATIA V4 Session
- CATIA V5
- DXF/DWG
- I-DEAS*
- IGES
- INVENTOR
- JT*
- Neutral
- Parasolid
- ProductVew
- STEP
- STL
- NX (UG)
- VDA
- VRML

* Available in WF4

Items in RED above are ATB compliant
Distributed Pro/BATCH Effectivity

Effect of Resource Availability on Processing Time

**Batch Task:**
Import CADAM (.bin) files into Pro/DETAIL (.drw)

**Resource Host Configurations:**
(3) SUN Ultra 60 running on Solaris 2.6
Dual Processor with 512 MB RAM

(1) Dell Precision 620 running on Windows 2000
Dual Processor with 512 MB RAM

**Network Factors:**
Normal LAN traffic (between 10 a.m. and 6 p.m.)

**Graph:**
- Processing Time (minutes)
- Number of Resource Hosts (Number of Processors)

- 200 Files (~ 8.1 MB)
- 100 Files (~ 2.5 MB)
- 50 Files (~ 0.9 MB)
> Key Features

- Resource Management
  - User-specifiable resources
  - Schedule resources
  - Enable/Disable resources
  - Heterogeneous set of resources

- Task Management
  - Job Queuing
  - Aborting jobs (if required)
  - Results caching

- Service Management
  - Assign client task to appropriate services
  - Start or shutdown services as required

- Single-Point Administration
  - User friendly GUI
  - Web based monitoring
  - Job accounting statistics

- Platform Independence
  - Windows & UNIX
**Key Benefits**

- **Leverage hardware resources**
  - Independent of hardware type
  - Desktop, Workstation, etc.
  - Independent of OS
  - Windows and UNIX

- **Optimize use of software licenses**
  - Schedule batch tasks when licenses are not being used

- **Manage number of jobs**
  - Requests from many clients
  - Queue requests as needed

- **Scalable Architecture**
  - Ability to grow the “server” farm

- **Centralized Administration**
  - Web access to all users for task monitoring
> Features

- Client-side API (C/C++ or JAVA) to develop custom distributed clients
  - Query Services and Service Managers
  - Perform Tasks and Get Results
- Server-side API (C/C++) to develop custom distributed services
  - Initialize Services
  - Query Task Status & Provide/Receive Task Info
  - Prepare Results
- Create services with Pro/E (via Pro/Toolkit) or with any user-defined executable code

> Benefits

- Leverage the DSM and your network resources in performing custom, business specific tasks
Distributed Pro/BATCH (aka dBATCH)

> Batch Operations in the context of Windchill*
   - Navigate to and authenticate with Windchill repositories
   - Create and submit batch jobs using data retrieved from multiple WC repositories
     • Workspaces and Commonspaces
   - Returns results back to Workspace for later Checkin to Commonspace

> Session Recovery for Distributed Services Manager*
   - Journals tasks and task status for rapid recovery of DSM sessions in the event of hardware failure

* New in WF3
Distributed Pro/BATCH (aka dBATCH)

> Wildfire 4.0 Enhancements
  - dBATCH - generic task via Pro/Toolkit
    - The ability for a Pro/Toolkit programmer to create custom Pro/E tasks to meet any enterprise business requirement without needing PTC to create the Task Type Definition
  - New Task Type Definition
    - Interface for JT
    - Interface for PDF (3D)
  - Improved Error Handling (M040 or later)

> Old Pro/BATCH will retire after Wildfire 4.0
  - No longer supported in Wildfire 5.0
Examples Use Cases

> European Auto Manufacturer
  – Batch Translation of Design Models between CATIA and Pro/E (~1500-2000 / night, OOTB dBATCH)

> Heavy Equipment Manufacturer
  – Proposed translation of Pro/E data to enterprise visualization and document formats (~200 Pro/E users per site, 16 sites worldwide, OOTB dBATCH)

> Asian Auto Manufacturer
  – Batch testing of legacy Pro/E drawings for User Modeling Errors (~60,000 drawings, Custom TTD)

> Medical Product Manufacturer
  – Batch adding and/or stripping of Parameter data from Pro/E models (Custom TTD)

> US Truck Manufacturer
  – Batch upgrade of Pro/E library parts from old version to new version (~120,000 models, Custom TTD)

> Office Equipment Manufacturer
  – Conversion of Product Models to Web-friendly format for customer-access catalog (DS APIs)
  – Throughput increased by 300% while saving $0.5M per year

> PTC Precision LMS Grading Engine
  – Batch Grading of Pro/E Customer Models to ensure training standards (DS APIs)
PTC’s Precision LMS Grading Engine leverages Distributed Services

Distribution of grading tasks makes possible 100’s OD simultaneous student assessments
> Exciting set of capabilities in Distributed Pro/BATCH
  - Extensive set of file formats for IMPORT and EXPORT
  - ModelCHECK execution in batch mode
  - Plotting and Printing

> Leverage network resources for distributed task processing
  - Resource management using Distributed Services Manager
    • Scheduling
      – Batch jobs on Distributed Pro/BATCH Client
      – Resources on Distributed Services Manager
    • Job Queuing
    • Web-based task monitoring

> Built on open web standards
  - HTTP
  - SOAP
  - XML
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