Go From Paper to Automated PDFs and Purpose-built Models

ProjectWise Learn Conference

Hans Koorneef, Technical Director EMEA

Bentley Systems

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Agenda

- ProjectWise InterPlot options for paper, offline raster and PDF creation

- Bentley i-model Composition Service for Automated and On-Demand PDF creation

- Bentley i-model Composition Service for Automated i-model creation, transformation and validation

ProjectWise InterPlot

ProjectWise InterPlot CONNECT Edition

- Provides a single integrated suite of publishing tools for producing accurate and intelligent project deliverables in paper or electronic format.
  - Integrated with MicroStation and AutoCAD, and supports input formats such as raster, DOC, XLS and PDF.
  - Supports popular engineering wide format printers/plotters
  - Client options for PDF and paper output
  - Server options for network printing to paper and raster offline files

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ProjectWise InterPlot CONNECT Edition

- ProjectWise InterPlot Organizer
  - Desktop export to PDF
  - Enabled by a CONNECTIONS Passport
- ProjectWise InterPlot Professional
  - Desktop export to PDF
  - Paper plots to "local" plotter
- Both require ProjectWise InterPlot Server for Client / Server network plotting
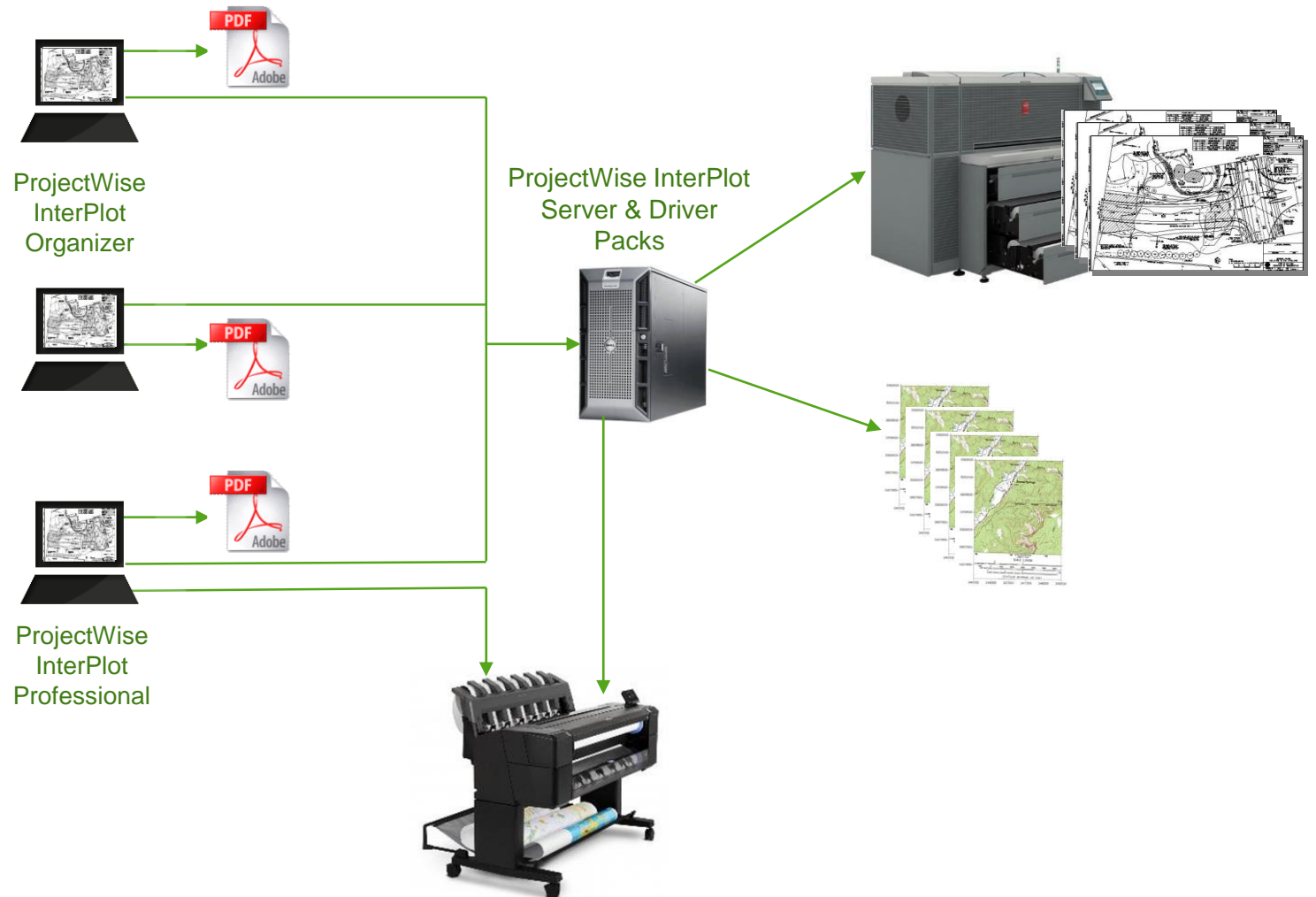
ProjectWise InterPlot Organizer

ProjectWise InterPlot Professional

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ProjectWise InterPlot for Client / Server Network Printing

- Add ProjectWise InterPlot Servers for network printing
  - InterPlot Driver Packs can be utilized on the InterPlot Server

ProjectWise InterPlot Organizer
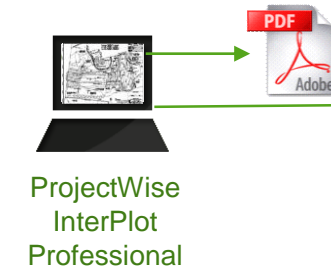
ProjectWise InterPlot Professional

ProjectWise InterPlot Server & Driver Packs

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Driver Options with ProjectWise InterPlot Server

- ProjectWise InterPlot driver packs
  - Collections of Windows printer drivers for driving engineering grade output devices and generating raster offline formats
  - *ProjectWise InterPlot Driver Pack*: Common Hewlett-Packard and Canon (Océ) Color Ink Jet printers
  - *ProjectWise InterPlot Mid-Volume Driver Pack*: Mid-level output devices such as the Canon (Océ) Colorwave 500 and PlotWave 750
  - *ProjectWise InterPlot High Volume Driver Pack*: Large format, multi-rolls & trays, high speed devices from Canon (Océ)
  - *ProjectWise InterPlot Raster Offline Driver Pack*: Raster formats such as TIFF, CALS, JPEG

- Windows Drivers from Plot Vendors like Hewlett-Packard, Canon (Océ)
  - Devices should support industry standard formats such as TIFF, HPRTL, CALS

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Feature Rich PDF Output from ProjectWise InterPlot

- Single and Multi-sheet PDFs
- Searchable Text
- Inter-document links
- Password Protection
- Print and Modification Restrictions
- Bookmarks
- Levels and References
- Link from DGN to areas of interest in PDF and Office content
- 2D PDF properties
- 3D PDF + Optional Properties
- Georeferenced PDF
- Digital Signature Fields
- Imbedded files such as movies, sounds or other project documents in their originating format
- Disproportionate scaled sheet measurements
- PDF/A-1b

Sheet Index

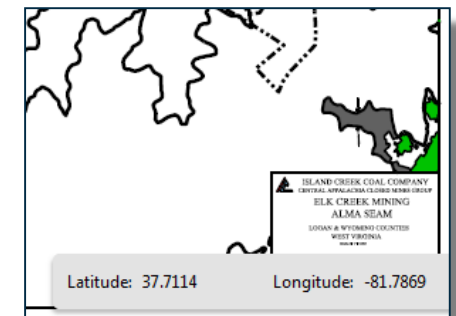| Sheet	Title
BSI400-C01	Cover Sheet
BSI400-P01	Plan Profile I-9 Southbound
BSI400-P02	Plan Profile I-9 Northbound
BSI400-P03	Plan Profile Township Road
BSI400-D01	Typical Section Details
BSI400-D02	Beam Guide Rail Details
BSI400-D03	Catch Basin Details

1-308A   1-20
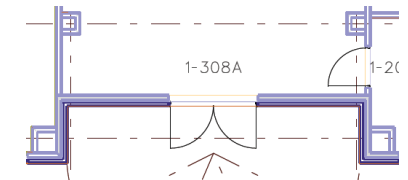
Door Specifications

Steel doors shall be manufactured by Mesker Door Inc., Huntsville, Alabama. Doors to be 14 Gauge or N Series Door series as shown on plans. Core material for doors to be urethane, polystyrene, honeycomb, or fiberboard as shown on plans.

N Series Door -- N Series Doors

Where 1 3/4 N Series Doors are indicated on plans, door construction shall be as follows: Doors shall be flush, constructed of two face sheets of 16, 18 or 20-gauge cold rolled steel, stretcher-leveled quality of flatness. Vertical edges of doors shall have neat hemmed edge seam mechanically interlocked for maximum structural integrity (seamless doors available when required by welding edge seam). All hinge reinforcements shall be 3/16 inch steel projection welded to door edge at three points above and 3 points below the hinge mortise. The top hinge reinforcement shall extend to the top of the door and have three extra projection welds on the extended leg.

ISLAND CREEK COAL COMPANY
CENTRAL APPALACHIA CLOSED MINES GROUP
ELK CREEK MINING
ALMA SEAM
LOGAN & WYOMING COUNTIES
WEST VIRGINIA

Latitude: 37.7114   Longitude: -81.7869

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ProjectWise InterPlot Settings Files

- **Enables reproducible deliverables regardless of the input/output format or product**
  - Store plotting parameters so t... be easily reused
  - Enforce drawing standards
  - Eliminate typographical errors
  - Assist novice users by reduci... navigate through dialogs enti... cases settings files get you cl... button printing"
  - Create in InterPlot Organizer > Edit > Settings File
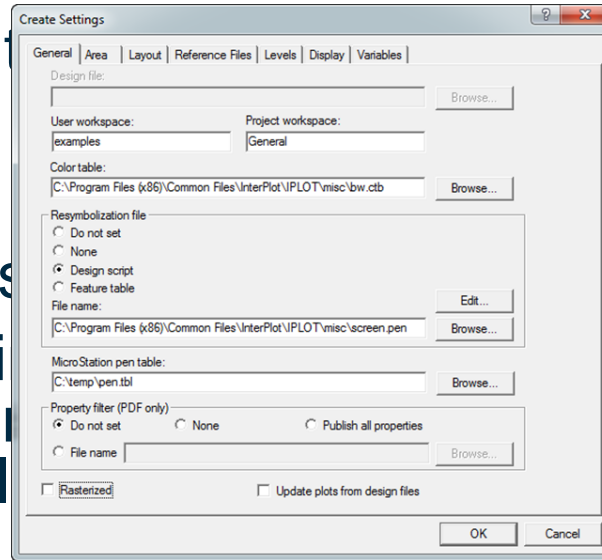
Define plot area

Define display of references and levels/layers

Define line widths, colors, styles, area fills, etc.

Define sheet order, size, orientation, etc.

MicroStation Pen table, Design Script settings

Multi-format settings

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InterPlot Integration with ProjectWise

- ProjectWise provides one place to manage & access InterPlot resources
  - Plot Sets
  - Settings Files
  - MicroStation Pen Tables
  - Design Scripts
  - Color Tables
- Enables consistency of output across the project

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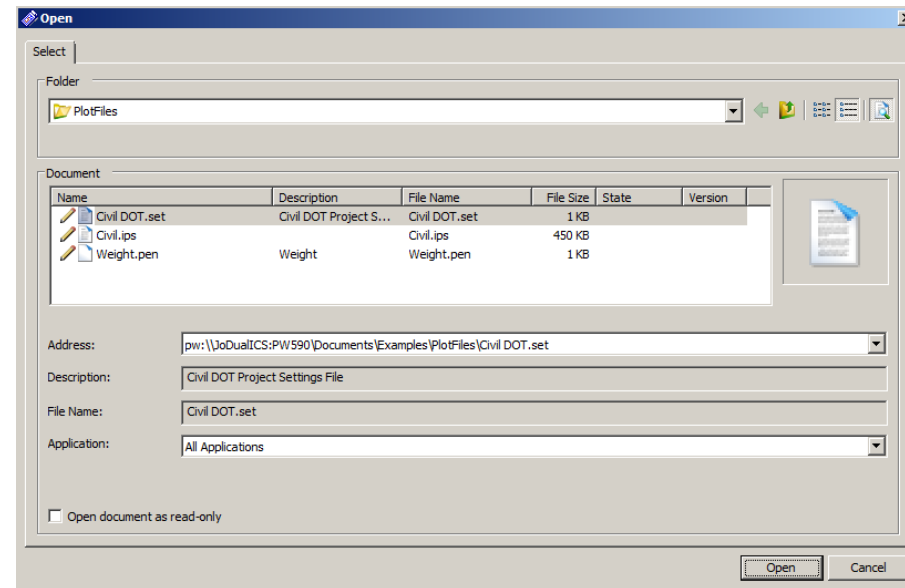
ProjectWise InterPlot
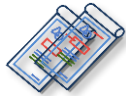
PW InterPlot Organizer, Server, Professional CE

- Windows 8.1, 10 & Server 2012 R2 (64-bit only) support
- MicroStation, PP CE support
- ProjectWise CE support
- AutoCAD 2014 & 15
- Compatible with Office 2010, 2013, 2016 & 365 (32- & 64-bit)
- PDF/A-1b format output – ISO digital archive standard

September / December 2016
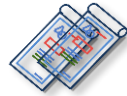
PW InterPlot Drivers CE

- Windows Server 2012 R2 64-bit support
- InterPlot Driver Pack:
  - HP DesignJet T7200, T3500, T2530, T2500, T1530, T1500, T930, T920, T795 & T520
  - Canon PlotWave 340 & 360
- InterPlot Mid-Volume DP:
  - Canon PlotWave 750 & ColorWave 500
  - HP PageWide XL8000, XL5000, XL4500 & XL4000
- InterPlot High Volume DP
  - Canon PlotWave 900

December 2016 / April 2017
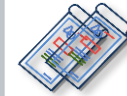
PW InterPlot CE Refresh

- Various fixes
- New feature for "find all shapes" to sort based on the location/placement in the design file. New in iplot.cfg:
  - IPLOT_AUTOAREA_SORT _MODE

June 2017

PW InterPlot

- New HP device support
- …..

TBD

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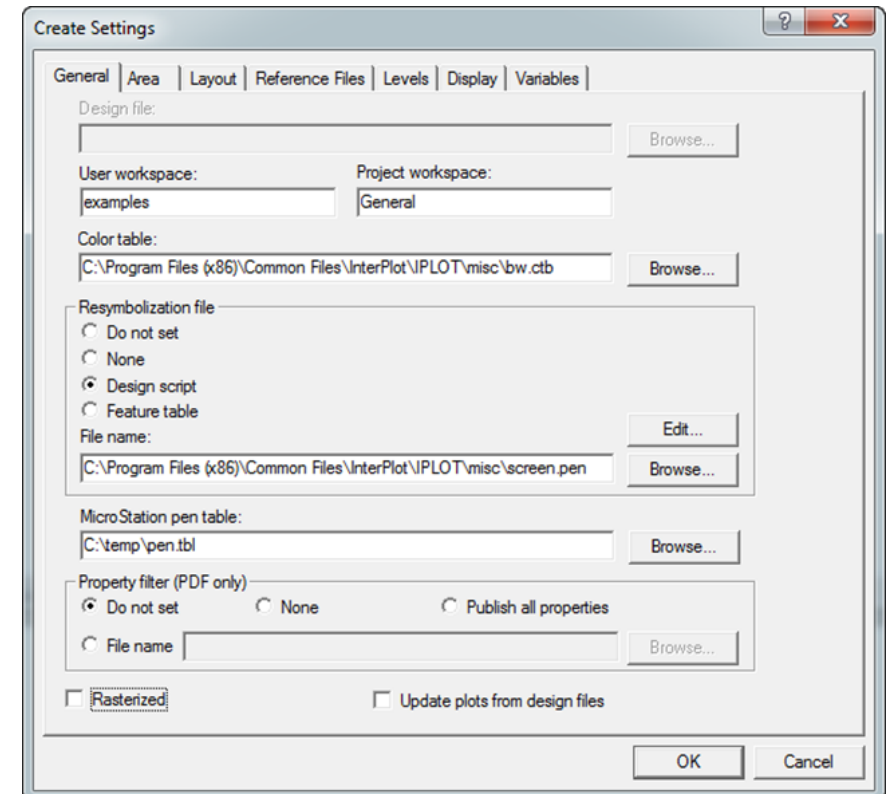# Bentley i-model Composition Server for PDF

Bentley i-model Composition Service for PDF

- Automates the creation of PDF and Raster files from a variety of files stored in ProjectWise
  - Use predefined publishing standards for presentation, format, file naming and destination
  - DGN, DWG, PDF, Raster, IPS (InterPlot Plot Set), Word, Excel input options
  - Single and multi-sheet PDF output
  - Create output interactively from ProjectWise Explorer or automated on a schedule via jobs setup on the server
  - Deploy the solution once. No required desktop installation or configuration.

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Bentley i-model Composition Service for PDF

- ProjectWise InterPlot Organizer is the foundation for iCS for PDF
- Takes advantage of existing InterPlot plot sets (IPS) and resources
- Use Settings Files for best results
  - Area qualifier definition
  - View attribute setting
  - Level and reference display
  - Sheet size
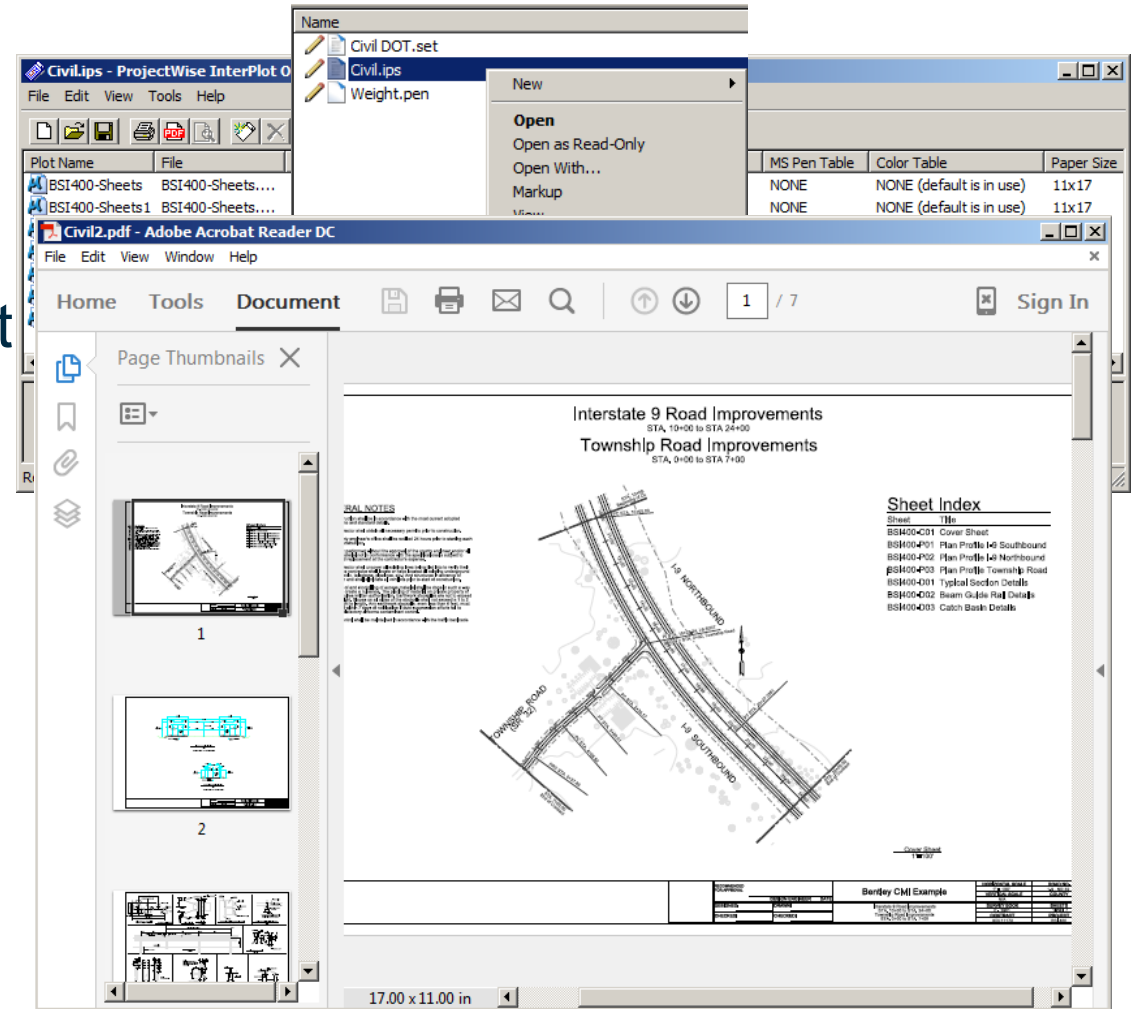 - Scale
  - Design Script
  - MicroStation Pen table

Bentley i-model Composition Service for PDF

- ## Single page PDF output from ProjectWise Explorer rendition jobs
  - Select DGN, DWG, PDF, Raster, Microsoft Word and/or Excel files as input
  - Utilize predefined Rendition Profiles defined by the ProjectWise administrator
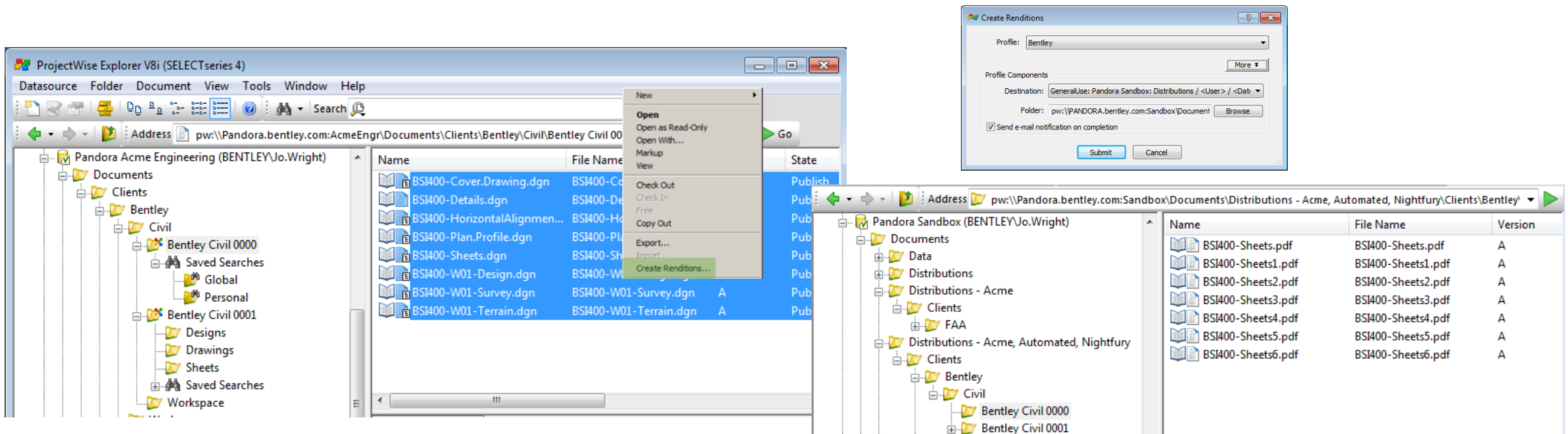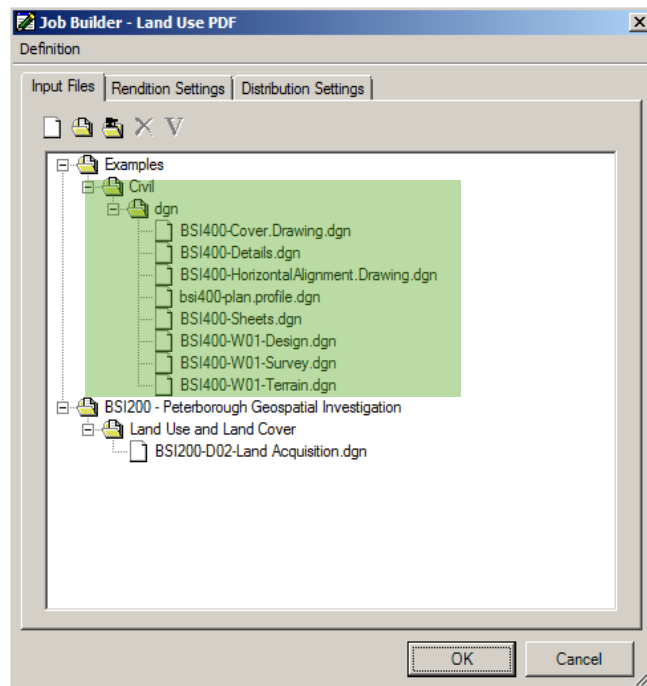
Bentley i-model Composition Server for PDF

- ## Multi-page PDF output from ProjectWise Explorer rendition jobs
  - InterPlot plot set (IPS) files as the input
    - Defines the order of the PDF pages
    - Defines the print settings
  - Set "Create one multi-page PDF document for each IPS file" when creating job

Bentley i-model Composition Service for PDF

- Automated jobs via Orchestration Framework Administrator
  - Single page PDF renditions utilize the same rendition settings defined for rendition profiles that are utilized by ProjectWise Explorer rendition jobs
  - Multi-page PDF output from single IPS files
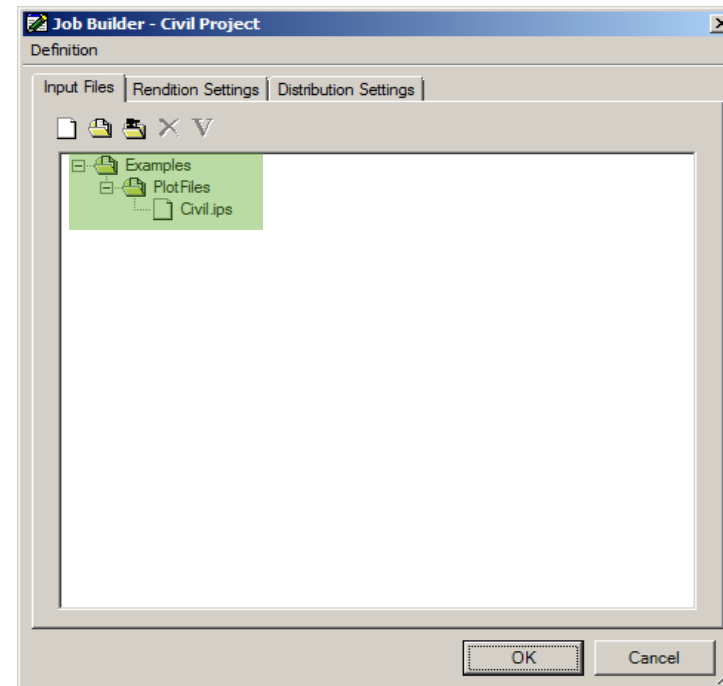
i-model Composition Service

iCS for PDF CE (2015)

- Support MicroStation CE
- Support ProjectWise CE
- Windows Server 2012
- Source Distribution Document and Folder Creation Options
- Additional Pattern Symbols
- Source Distribution Support in ProjectWise Explorer Job Submissions
- Source Distribution Folder Specification
- Source Distribution File Name Specification
- Source Distribution without References
- Copy Version Name
- Copy Workflow State
- Rendition Profile Component Deletion Improvements
- Begin Processor and Extraction Dispatcher
- PDF/A-1b ISO format added as PDF option

iCS for PDF CE

- Support MicroStation CE Update 5
- Support ProjectWise CE Update 2.2
- Full ProjectWise Managed Workspace support
- Process management improvements
- Improved Job Monitor status info
- Better Error Logging Tool

June 2017

iCS

- Support new MicroStation CE Updates
- Remote Administration for hosted iCS servers
- SQL 2016
- …..

TBD

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i-model Composition Server for PDF – TIPS!

- Setup the iCS for PDF server just like you would a ProjectWise InterPlot print client machine
  - Install and configure all vertical applications that need to be used as a plot processing engine. This ensures PDF fidelity.
- Anytime you have issues with PDF fidelity, test the output from the iCS for PDF server, not your local desktop.
  - Open ProjectWise InterPlot Organizer
  - Log-in to ProjectWise using the iCS user account
  - Utilize the same settings/resources as the iCS for PDF job
  - Export to PDF
  - This helps to pinpoint if the issue is with iCS or InterPlot. You must test on the server as iCS does not run on the client!

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Bentley i-model Composition Service for PDF - TIPS

- Do not mix IPS plot set files and design or other files in one rendition job.
  - Select an IPS file for a job to generate PDFs.
  - Select all other format files in another job.
  - If you create jobs based on the contents of a folder, be sure not to mix IPS files in the same folder with your design files.
- Always troubleshoot issues on the iCS server, not another desktop machine as they may not be setup the same!
  - Is data missing in your output? Check if it displays correctly in MicroStation.
  - Was the file created in a product such as ABD? Load it on the server so the data can be rendered correctly.
  - Is it a DWG file? Is the correct version of RealDWG installed? Are the correct object enablers loaded on the server?

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Bentley i-model Composition Service for i-models

- Automates the creation of i-models (i.dgn & .imodel) from a variety of files stored in ProjectWise
  - Uses predefined settings for format, file naming and destination, as well as operational rules for i-model transformation and validation
  - ProjectWise managed DGN, i-model, DWG, Civil 3D and IFC input file options
  - i-model creation, transformation and validation is automated on a schedule via jobs setup on the server utilizing designated files, folder contents or saved searches
  - Deploy the solution once. No required desktop installation or configuration.

Bentley i-model Composition Server for i-models

i-model Creation, Transformation & Validation Workflow
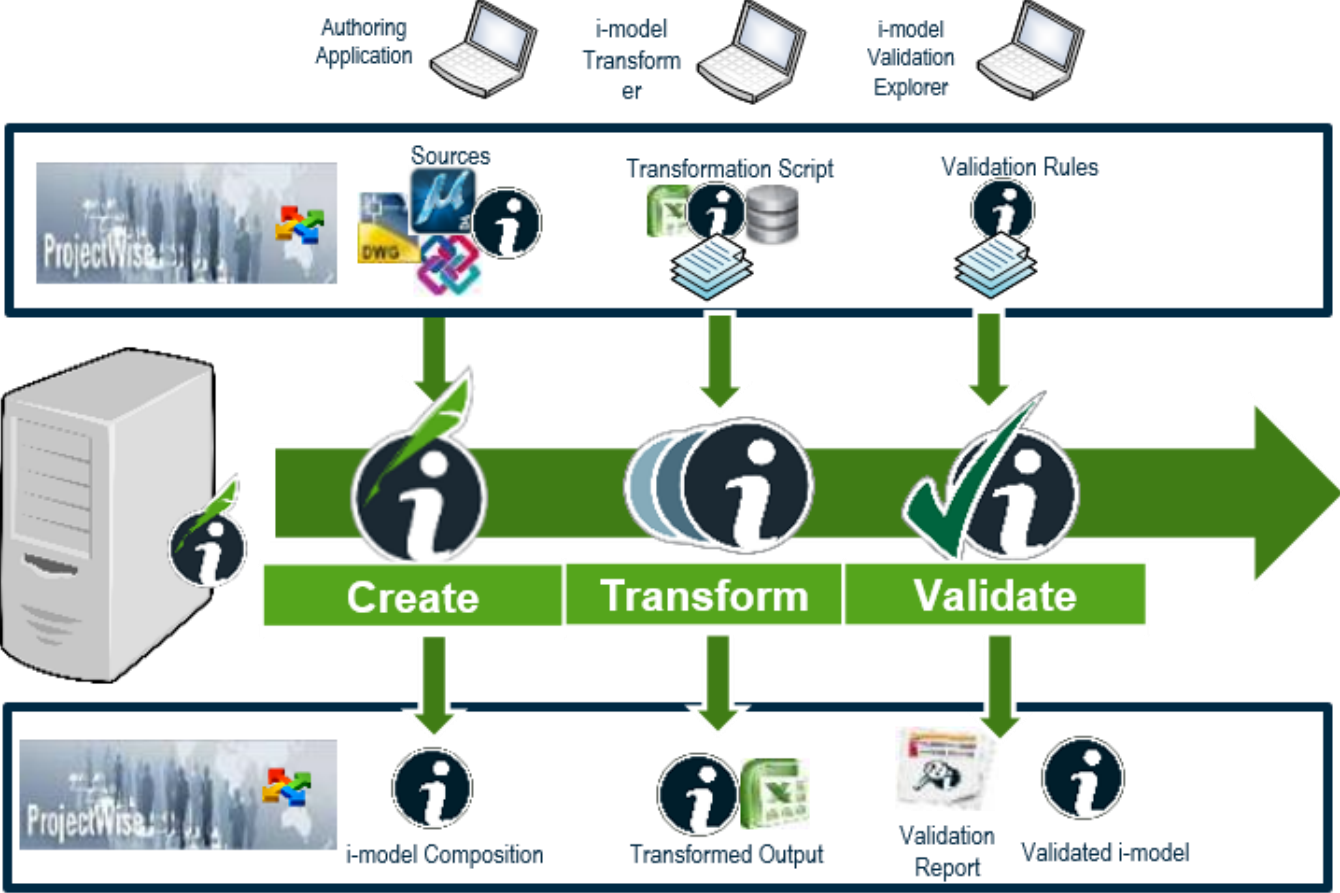
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Bentley i-model Composition Server for i-models

- **Produces intelligent deliverables**
  - V8i Published, Packaged and mobile i-models
- **From multiple information sources**
  - DGN, i-models, DWG, and IFC files managed in ProjectWise
- **Based on predefined settings and operational rules**
  - Format, Filename, Destination
  - Transform and Validate
- **Processed on schedule**
  - Files or Folder Contents or Saved Searches
  - Full or incremental jobs
- **Through a server-side solution**
  - Deploy once with no required desktop installation or configuration

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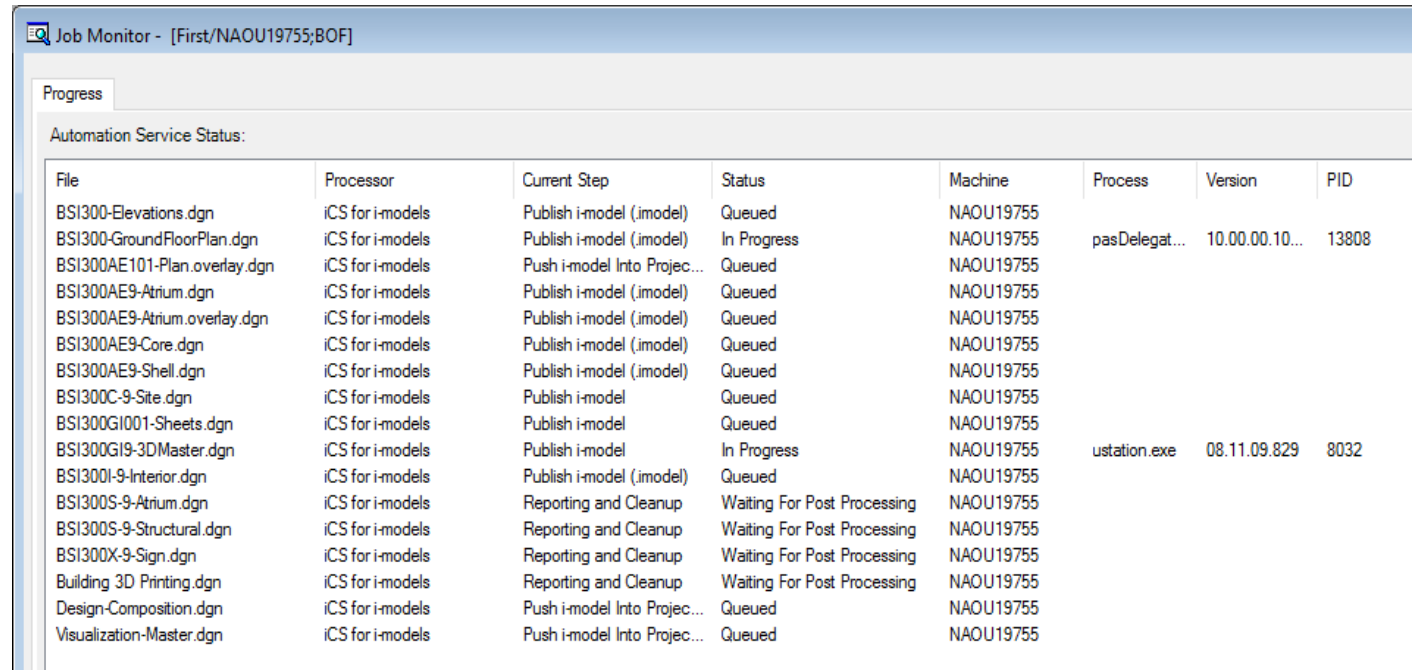
Types of i-models Created by i-model Composition Service

- *Intermediate*: An i.dgn is created for each master and reference.They are written to the originating file's folder or subfolder. Choose to retain i.dgn files so subsequent jobs will run faster. Only changed design files will create new i.dgn files.

- *Packaged*: The intermediate i.dgn files packaged into a single file.

- *i-models*: . *imodel* files include the master and references and are for mobile workflows. iCS for i-models CE creates the new format DgnDb 0601 i-models.

- All i-model types support the same publish settings that available from the desktop.

Publish Settings

☑ Cache Visible Edges for 3D Attachments

☐ Retain Cached Visible Edges Even if Out Of Date

☑ Filter Design History

☐ Publish Linked Design Files

☐ Publish Displayed Attachments Only

OK   Cancel

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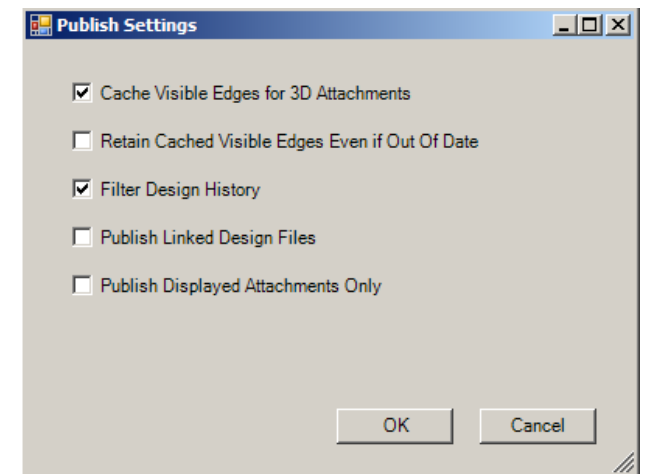
i-model Composition Service CE: Better Progress Monitoring

- Distinguishes between queued and in progress jobs
- Shows more detail, including:
  - Machine
  - Process
 - Process version
  - Process ID

Bentley i-model Composition Server – i-models

- **Improved ProjectWise Application Integration**
  - Managed Workspaces are supported by default
  - Support for ProjectWise Defined Program Associat
- **Improved Remote Job Administration**
  - Manage scheduled jobs via a predefined user defin by the host administrator
  - Facilitates MANAGEservices usage
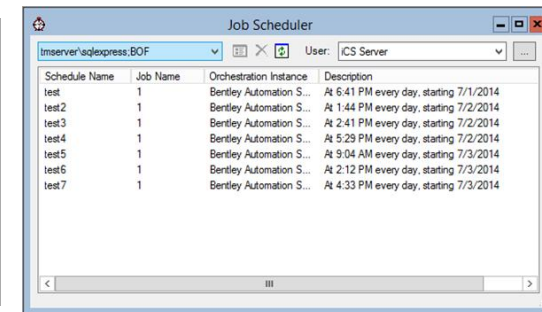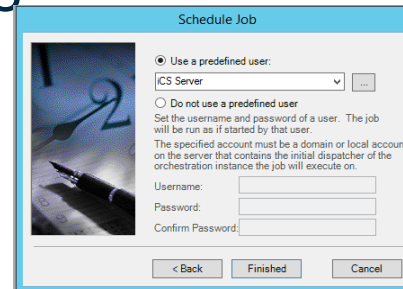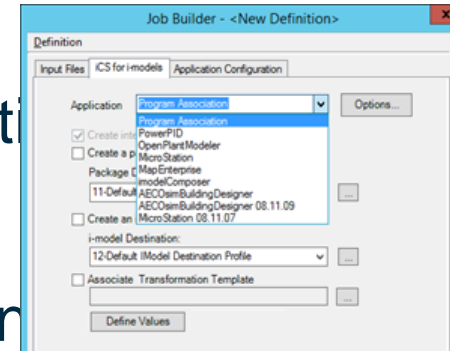
i-model Composition Service CE: Better Process Management

- Maximum Memory Usage (while processing message) and Maximum Single Message Idle Time.
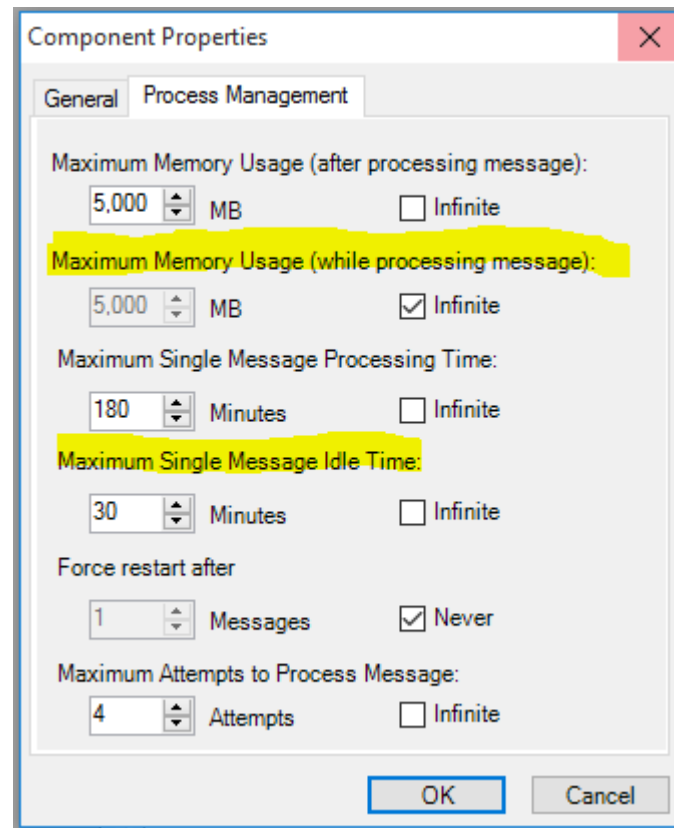
i-model Composition Service CE: Better Error Logging Tool

- **Log to Excel converts the text log file into an excel spread sheet.**
  - Color coding for better visualization and filtering for finding and analyzing issues

	Date/Time	Severity	Namespace	Thread	Log Message	Machine	Process	PID	Provenance
921	4/4/2016 9:50.22.789	DEBUG	AutoServ.API		27 Status-[IDgnToIDgnDb.exe(pid=9144)]Visualization-Master.dgn: <If name="A-G321-G3-Windw" file="BSI300AE9-Atrium"><Then merge="false"/></If> (processing time: 00:01:02.5469961)	NAOU19755	pasDelegateProcessor.exe	7400	C:\ProgramData\Bentley\Logs\LoggingService.log
	4/4/2016 9:50.22.928	TRACE	OrchFwrk.MessageMonitor	MonitorMessage Thread	process pasDelegateProcessor(pid=7400) Current Memory and CPU Usage %DeltaValueCounter ---- -0.01%33619968.00Private Memory Size	NAOU19755	pasDelegateProcessor.exe	7400	C:\ProgramData\Bentley\Logs\LoggingService.log

 - Additional logging for machine, process and PID correlates with additional monitoring

Automation Service Status:

File	Processor	Current Step	Status	Machine	Process	Version	PID
E-Floor_1.dgn	iCS for i-models	Reporting an...	Failed -- Mess...	VILTEST2-30	MicroStation.exe	10.01.00.05	59328
E-Floor_2.dgn	iCS for i-models	Reporting an...	Failed -- Mess...	VILTEST2-30	MicroStation.exe	10.01.00.05	37500
F-Floor_1.dgn	iCS for i-models	Reporting an...	Failed -- Mess...	VILTEST2-30	MicroStation.exe	10.01.00.05	25856

Date/Time	Severity	Namespace		Log Message	Machine	Process	PID	Provenance
2/23/2016 15:09.30.227	ERROR	OrchFwrk.PowerPlatform.microstation	1	Keyin: "rd="{1}\file={2-30}\at 10.00.06.17\D\A\PA_{3}E-Floor_1.dgn"" completed with a return code of "-1" and a status message of "Message Center: No actions to UNDO".	VILTEST2-30	MicroStation.exe	59328	C:\ProgramData\Bentley\Logs\LoggingService.log
2/23/2016 15:09.54.056	WARN	AutoServ.AutomationServiceMDLApp	1	Ref Attach - Looking for E-Floor_1.dgn but Automation Service is not aware of its location. Reference file E-Floor_1.dgn is not a PW logical path or a relative path.	VILTEST2-30	MicroStation.exe	25856	C:\ProgramData\Bentley\Logs\LoggingService.log

  - C:\Program Files\Bentley\OrchestrationFramework\Tools\Logging\log4nettoexcel.exe
    - -? will show usage and examples

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Bentley Automation Service CE: Configurable DGN Indexing Engine

- Expanded engine support to include any MicroStation-based application that is installed on the server.
  - Engine Options:
    - Use the Currently Running Application (last used)
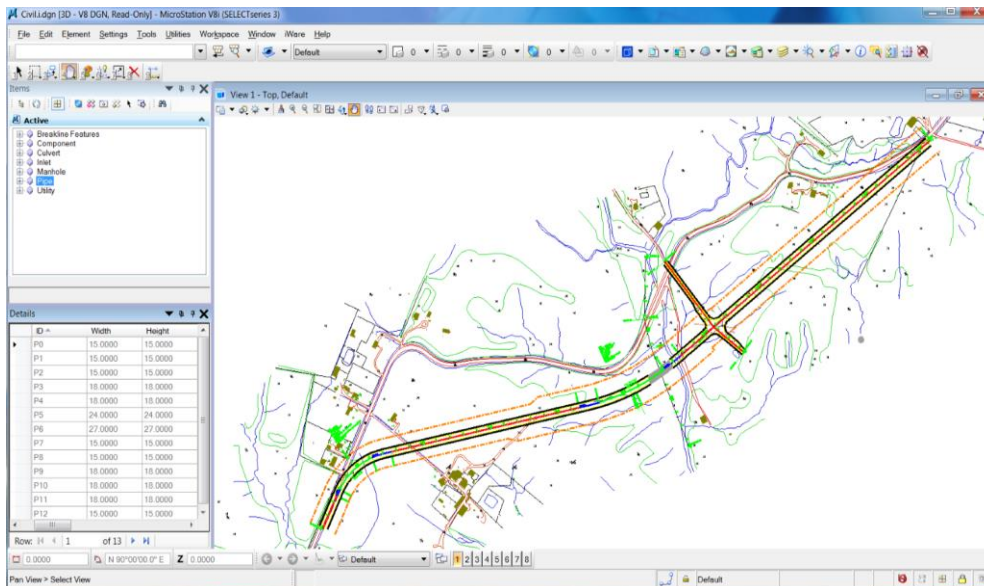   - Select a MicroStation-based application to always use

Bentley®
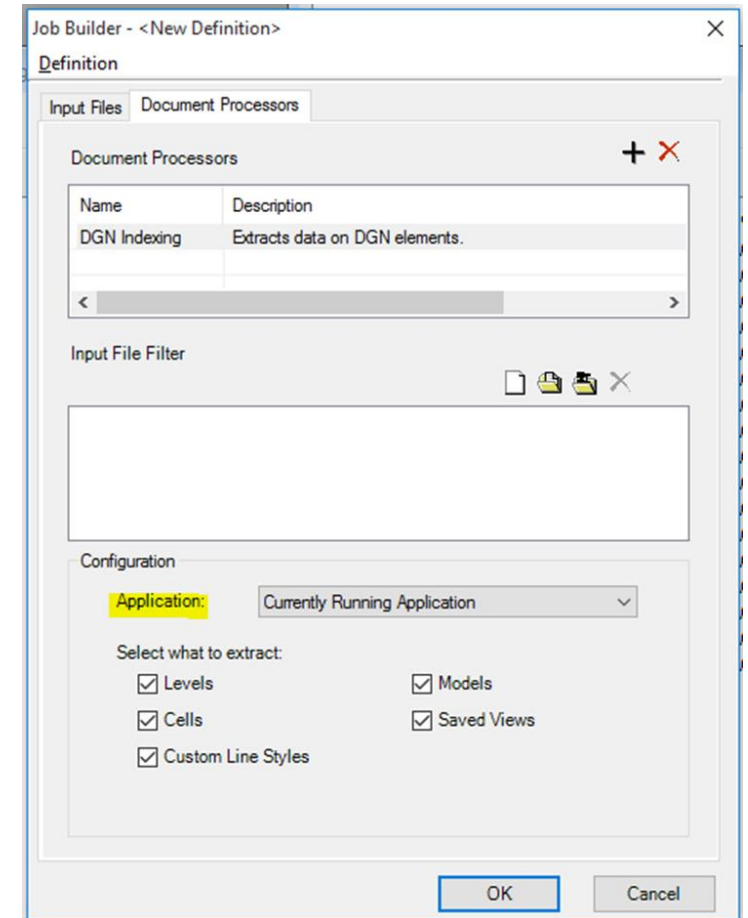
i-model Composition Service for i-models

- ## Integrated with i-model Transformer
  - Automate transformation for purpose built i-models
  - Accommodate unique project information exchange requirements
  - Validate i-model contents prior to sharing to ensure integrity
  - Scripts are written on the desktop and imported into iCS for i-model jobs

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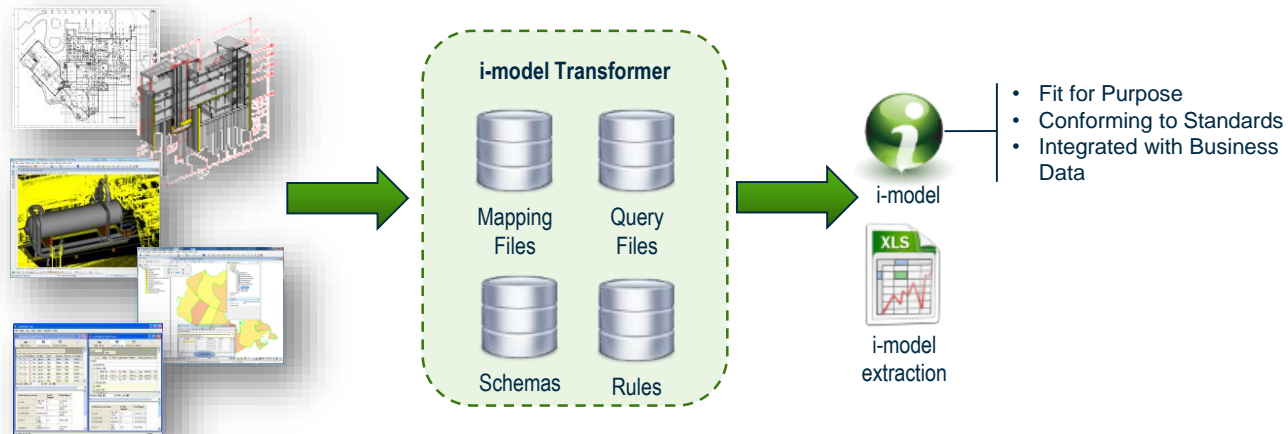
Automated i-model Transformation Example 1

- Inventory information for estimating, purchasing, etc.
  - Count tagged items (assigned business keys)
  - Compute quantities of bulk material (non-tagged items, e.g., piping)
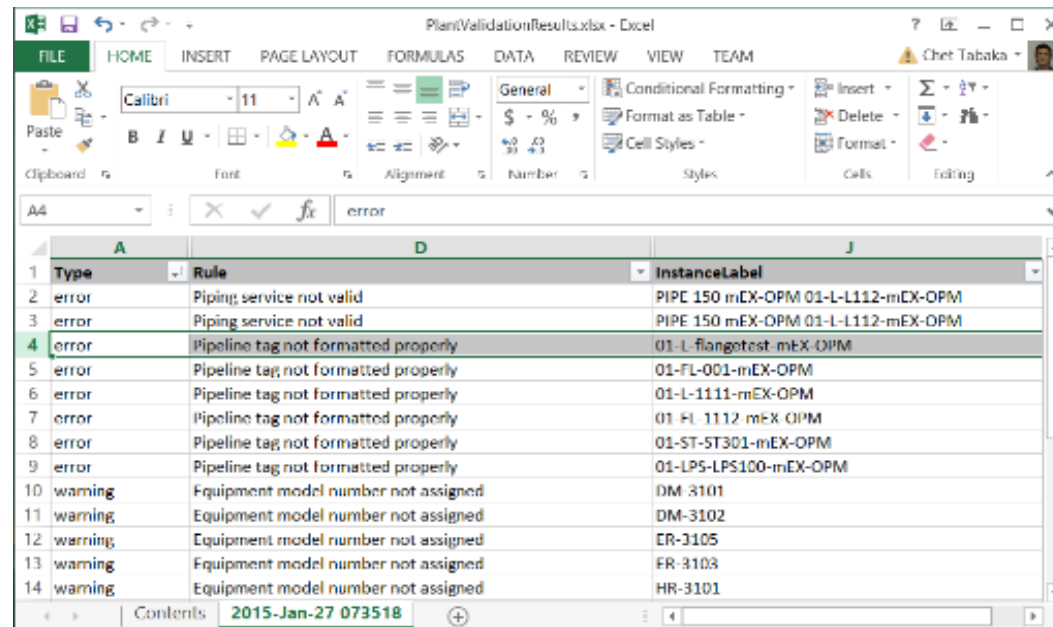 - Use case: Generate material takeoff for draining items in roadway design

Automated i-model Transformation Example 2

- ***Visualize information*** for improved understanding of the data for decision support.
  - Color-code based on item and property criteria
  - Use case: View equipment damage status in an operating processing plant
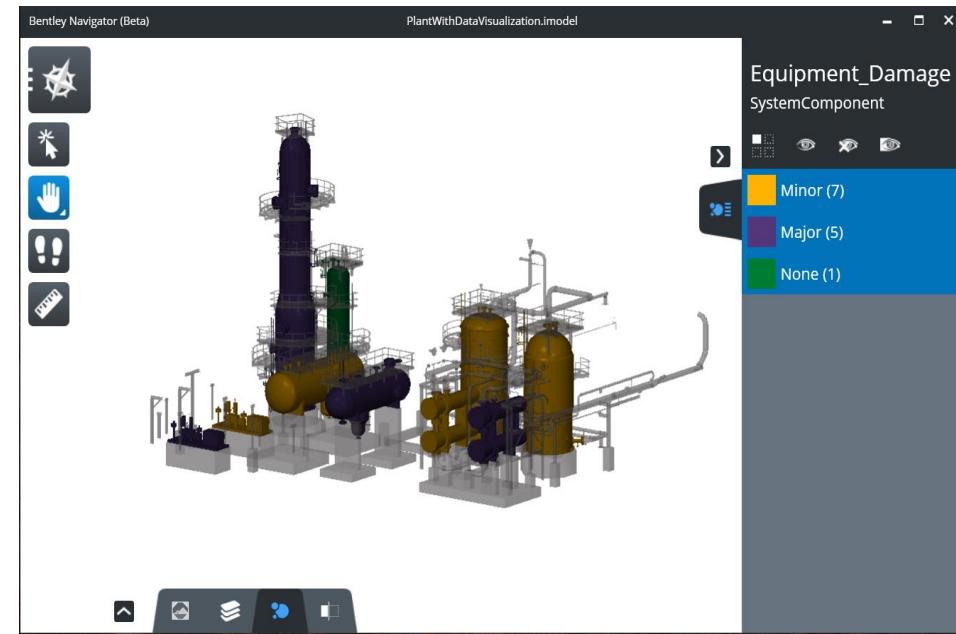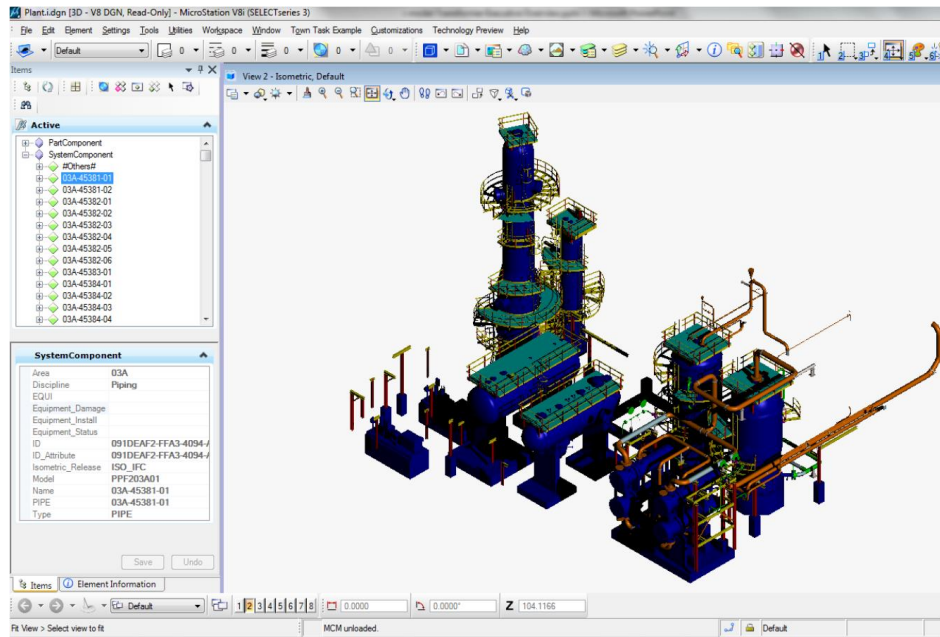
Automated i-model Validation

- ***Validate information*** for incoming and outgoing deliverables to ensure required data is provided and for quality control
  - Check i-model contents to ensure workflow requirements are met
  - Validation results written to an XML or XLS file
  - Use case: Check pipeline, equipment, valve and other tags are assigned and formatted based on project standards

Workflow with i-model Transformer

- On a desktop machine, install i-model Transformer and integrate it with MicroStation or a Power Platform product
- Create transformation scripts and validation rules
- Import these scripts into iCS for i-models when creating a job on the server
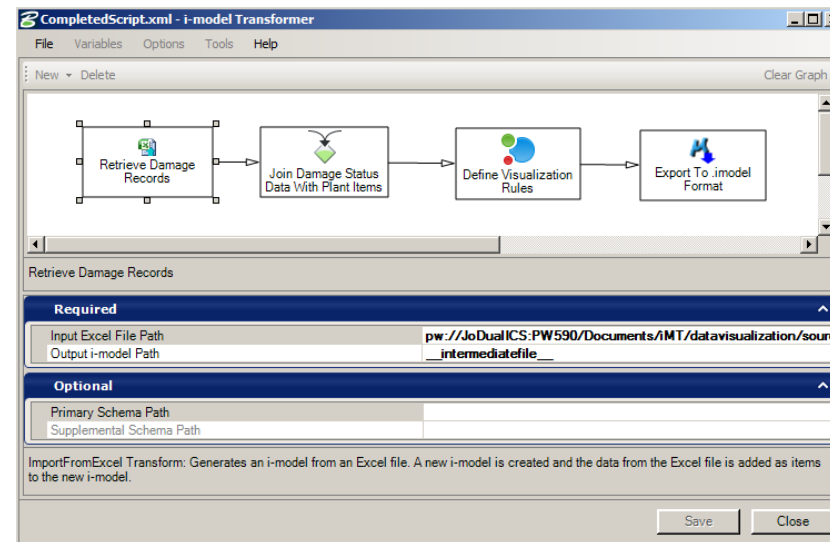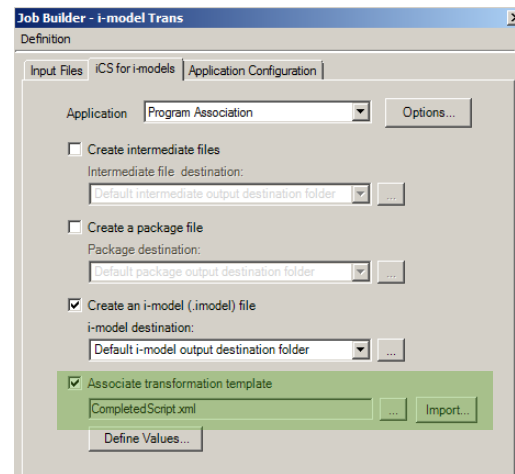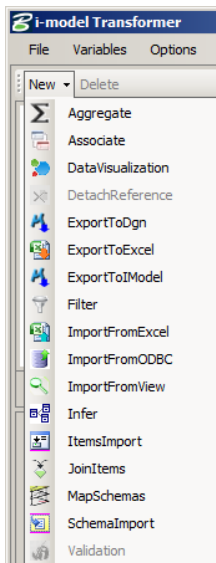
Bentley i-model Composition Service Details

- iCS for PDF (Included in ProjectWise Server Setups)
- iCS for i-models (Delivered by Bentley Automation Service)
  - Includes Orchestration Framework

  - Both can be installed on the same server
  - Load iCS for i-models first along with OF, then load iCS for PDF

Bentley i-model Composition Service

Bentley Automation Service (iCS for i-models)

Bentley i-model Composition Service for PDF

Bentley
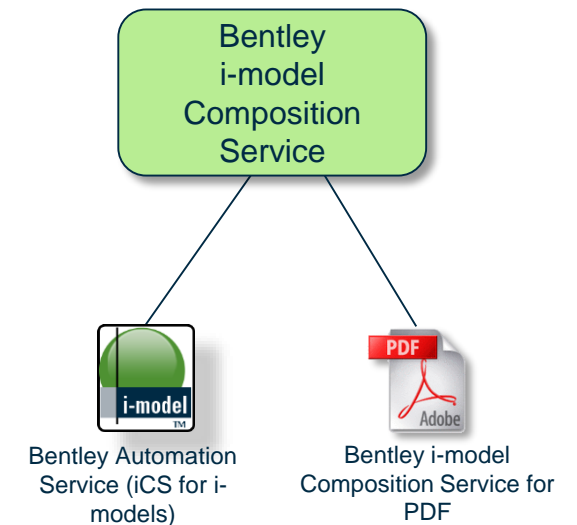
i-model Composition Service

iCS 4 i-models V8i SS6

- Improved file naming and destination folder definitions via profiles
- Added attribute mapping
- Improved application integration
- Improved remote job administration in a hosted environment
- Integration with i-model Transformer (automated i-model transformations and validation)

2015

iCS 4 i-models CE

- Support MicroStation CE Update 4
- Support ProjectWise CE Update 2
- Process management improvements
- Improved Job Monitor status info
- Better Error Logging Tool
- Create i-models from AutoCAD Civil 3D files
- Creates DgnDb 0601 mobile i-models
- Use any MicroStation based app as the DGN Indexing engine

March 2017

iCS 4 i-models CE

- Support MicroStation CE Update 5 (no 4 and below)
- Support ProjectWise CE Update 2.2
- Full Managed Workspace support
- ABD CE support

July 2017

iCS

- Support new MicroStation CE Updates
- Remote Administration for hosted iCS servers
- SQL 2016
- .....

TBD

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Go From Paper to Automated PDFs and Purpose-built Models

ProjectWise Learn Conference

Hans Koorneef, Technical Director EMEA

Bentley Systems

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