

Smart Instrumentation V2018 Upgrade

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Purpose

- About Mangan Inc
- Upgrades to SI V2018
 - ✓ Object Registry Table, EDE Module, UDF's & UDT's
 - ✓ Pre-upgrade tasks
 - ✓ Post-upgrade tasks
 - ✓ Proposed Environment
 - ✓ Upgrade Process
- Changes
- Mangan Services with Upgrades

About Mangan Inc

- A Control Systems and Automation Specialty Engineering Company
- An Employee Owned Company (ESOP) with +350 employees and 8 – 10 offices nationwide
- As of 2018, safe working man hours is 3MM man hours
- Have been using SmartPlant Instrumentation “SPI/INtools ” for projects “Engineering and Design” since 2007
- SmartPlant Instrumentation services group officially founded in 2012
- Currently, the pure Mangan SmartPlant Instrumentation team consists of 25 team members:
 - ✓ 4 to 5 SPI SME’s
 - ✓ 2 to 3 SPI Technical Consultants
 - ✓ 3 to 5 SPI Super Users
 - ✓ 5 to 8 SPI Users
 - ✓ 3 to 4 SPI Entry Level

Object Registry, EDE, and UDF's & UDT's

- Object Registry Table:
 - ✓ Used now to register most of the SPI items for Claim & Merge, and Hexagon Smart Application Integration
 - ✓ As-Built and Project items are registered
 - ✓ Item ID's, Item Names, parent ID's, and Wiring item sequences are registered. These items are registered to determine how items to be merged into As-Built "Overwrite, duplicate, correlate, revision management, etc"

- EDE Module:
 - ✓ Used to allow for a better visibility of Data, Data Validation, and enhanced functionalities "Most are similar to Excel with Filters, Sort, Copy & Paste, etc"
 - ✓ Used to replace most previous browser module views such as instrument index, criticality & Category, wiring, etc
 - ✓ Some older browser views still exists especially Specification Form Browser Views

- UDF and UDT:
 - ✓ Use to be at Plant level but **NOW** at the Domain level
 - ✓ Need to be synchronized

Pre-Upgrade Tasks

- Source SPI version is V2013 and lower
- Defined by Hexagon (documented on the Hexagon knowledge base):
 - ✓ Wiring Item Sequences:
 - Need to analyze/evaluate to ensure wiring items sequences are unique “Panel_strip, Panel_strip_term, apparatus, channel, cabinet_rack, rack_position, cable_set, and wire”
 - Update as needed to ensure uniqueness
 - ✓ ID Values:
 - Need to analyze/evaluate to ensure uniqueness of SPI items ID values “loops, tags, lines, wiring items, etc”
 - Update as needed to ensure uniqueness
 - ✓ Hexagon Checkdb:
 - Analyze results and resolve issues
 - ✓ Identification of Project Deleted Sub-Items
 - Upgrade cannot handle and will bring them back “Ex: Wires and Terminals”
 - ✓ Other
 - Integration To Do List

Pre-Upgrade Tasks

- Defined by Mangan:
 - ✓ Duplicate P&ID's and Project P&ID's
 - ✓ Wiring items Null Category
 - ✓ Wiring items Zero and Null Sequences
 - ✓ Merge – Release Flag
 - ✓ Fluke UDF fields
 - ✓ Identification of deleted As-Built claimed items
 - ✓ Claimed Engineering Data for Tags that already have As-Built wiring
 - ✓ Claimed Tags that already have Engineering data in both “As-Built and Projects” and not Claimed
 - ✓ Usage of Criticality and Category
 - ✓ Claimed incomplete cross Wires
 - ✓ Claimed incomplete jumpers
 - ✓ Claimed incomplete general signal relation with tags
 - ✓ Other ID values cleanup

Pre-Upgrade Tasks

- P&ID's
 - ✓ P&ID's now uses eng_proj_id and eng_ref_id = 10 in the drawing table
- Fluke UDF fields
 - ✓ Calibration UDF C16 to C20 are reserved for Fluke Interface
- Identification of deleted As-Built claimed items
 - ✓ Upgrade will define these items as Semi-Active in the project
- Claimed Engineering Data for Tags that already have As-Built wiring
 - ✓ Causes deletion of tag signal after merge
- Claimed Tags that already have Engineering data in both "As-Built and Projects" and not Claimed
 - ✓ Cases data not to be overwritten
- Criticality and Category
 - ✓ Criticality requires power supply and Category association is not part of Criticality function
- Cross Wiring
 - ✓ Claimed incomplete cross wires causes deletion of Cross Wiring after merge
 - ✓ The uniqueness of the wire Set_level field is equal to the wire_id

Pre-Upgrade Tasks

- Claimed incomplete jumpers
 - ✓ Claimed incomplete jumpers causes deletion of jumpers after merge
 - ✓ The uniqueness of the wire Set_level field is equal to the wire_id
- Claimed incomplete general signal relation with tags
 - ✓ Causes deletion of general signal and relation with tags after merge
- Other non-primary ID values cleanup
 - ✓ Duplicate dwg_id in the process data tables and spec_sheet_data table “excluding multi-item data sheets in the spec_sheet_data table”
 - ✓ Duplicate pd_gen_id in the process data and specification tables
 - ✓ Case_id = 0 when the cases is Enabled for a SPI item
 - ✓ These problematic records will not register in the object_registry table

Post-Upgrade Tasks

- Defined by Hexagon
 - ✓ Checkdb “No longer exists in SI V2018”
 - ✓ Regeneration of specification pages and possibly SpecDD
 - ✓ Admin maintenance utilities
 - ✓ Lutchk Utility
 - Identifies DDDW and DDL values that the EDE module cannot handle
- Defined by Mangan
 - ✓ Revisions
 - ✓ Custom Reports
 - ✓ Engineering and Design Data comparison “Strongly Recommended”
 - ✓ All necessary items are registered in the object registry table
 - ✓ Lutchk Results

Post-Upgrade Tasks

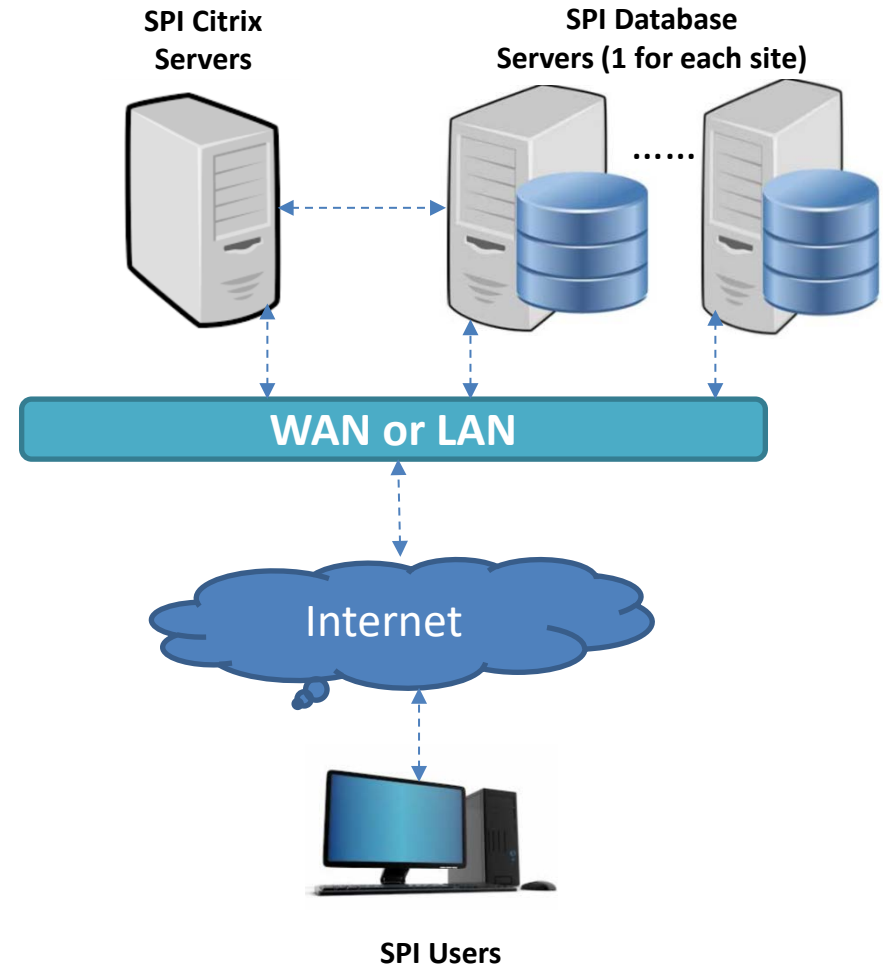
- Revisions
 - ✓ Revisions “Rev_id” in SPI V2016 and higher are unique
 - ✓ The upgrade does not make them unique
 - ✓ Need to analyze/evaluate claimed revisions and make necessary changes due to revision merge (by ID or Name) and overwriting or duplicate revisions
- Custom Reports
 - ✓ Custom Browser views and Import PSR reports
 - ✓ Need to be analyzed and tested to ensure they are working as expected
- Engineering and Design Data comparison
 - ✓ Loop Drawings
 - ✓ Strip Reports
 - ✓ Specification Sheets
 - ✓ Process Data Sheets
 - ✓ Archived revision reports
 - ✓ Counts
 - ✓ Etc

Post-Upgrade Tasks

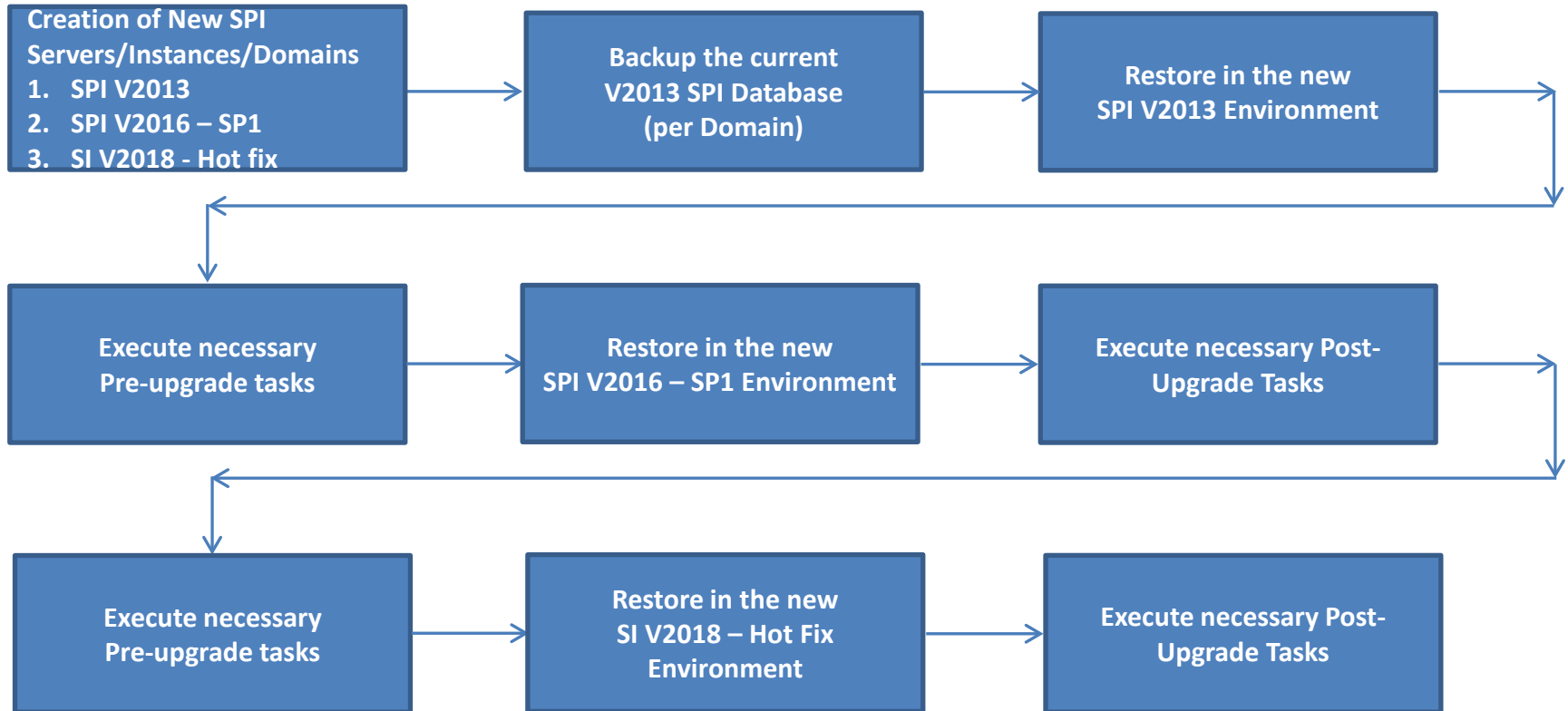
- All necessary items are registered in the object registry table
 - ✓ Never Delete object registry items and re-run register items if deleted claimed items exists in the project
 - ✓ This will cause deleted claimed items to be unrecognized by the project merge
- Lutchk Results
 - ✓ The Lutchk fix is by executing insert statements
 - ✓ Ex: US gal/min “Default SPI value” vs. GPM “Added via Import or custom spec”
 - ✓ Mangan strongly recommend not to run the insert statements
 - ✓ The insert statement will be executed against certain tables such as the unit_of_measures table
 - ✓ Instead, analyze the results and fix problematic SPI data
 - ✓ If added via insert statement, SPI users may select GPM which means incorrect results with calculation especially with Flow. Not to mention, duplicate selections

Recommended Environment

- *Always follow the Hexagon documentation for proper installation and configuration*
- *1 Server – 1 Instance/Database for each SPI Domain OR at least ensure each SPI domain is created in its own instance/database*
- *RAM, recommended minimum of 16GB – 32 GB for SPI domains with heavy activity*



SI Upgrade Process



Notes:

- At least 3 servers will be required for the upgrade process (each SPI version requires a different operating system and Database)
- Pre-upgrade tasks can either be executed on the new SPI V2013 server or directly on the production environment first
- During the upgrade process, the specific SPI V2013 site domain must be in a View Only Mode (No new records or modifications)
- The SI V2018 server can serve as the production environment once upgrade is complete

Some Changes

- SPI Instrument Criticality and Category
 - ✓ SI V2018 requires any Instrument Criticality association to have the Required Power Supply ON “Hexagon change is because Criticality is for Power Supply equipment”
 - ✓ SI V2018 Associate Criticality and Category is no longer within the same window
 - ✓ Therefore, the consideration is:
 - Move Criticality to a User Define Table and Lock it from edits
 - Creation of a EDE view to show Criticality and Category
 - Revising existing procedure

- SPI claim and merge procedures
 - ✓ Engineering and Design Data
 - ✓ Revision Management
 - ✓ Claimed Terminals and Wires and Connection Window
 - ✓ Claimed items and projects
 - ✓ EDE “As-Built vs. Projects”

Mangan SPI Upgrade Services

- SPI domain upgrade per option selection

Item	Option1	Option2	Option3	Option4
Upgrade	✓	✓	✓	✓
Mangan Identification and Fixes	✓	✓	✓	X
Testing	X	✓	✓	X
Comparison	X	✓	✓	X
Owner Operator Activities	X	X	✓	X

- Additional Services:

- ✓ Development of a pilot plan for the upgrade process “Test vs. Production”
- ✓ Implementation and/or Support for SPI Server Installations and SPI software installations
- ✓ Support Citrix installation and configuration
- ✓ Development of Documentation, procedure, and EDE Queries
- ✓ Development of User Training manuals and conducting the training
 - EDE Module “1 Day”
 - Claim and Merge “1 Day”

Questions

