



# Best Practices for Using and Deploying the Asset Framework

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OSIsoft.

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# What does Asset Framework do for me?



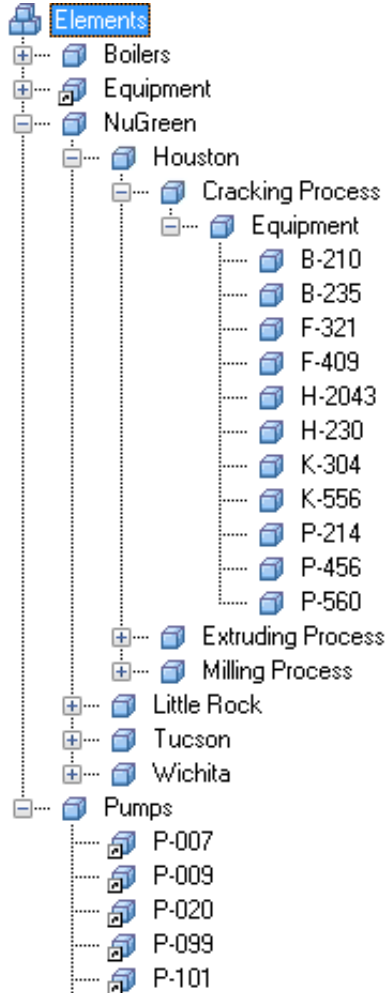
- “Data Dictionary”
  - Aggregate your data
  - Let’s you find the relevant information
- Unify disparate source systems – single version of truth
- Basis for comparison and collaboration
- Embed domain expertise
- Context for searching, analyzing and viewing data



# The Value of AF: Structure



- The PI Data Archive is extremely good at:
  - Storing data vast amounts of data collected by interfaces
  - Easily retrieving this time-series data for playback
  - Scalable, Maintainable and Highly Available
- The PI Data Archive is focused on a points database
- Asset Framework (AF) is a Meta-data structure for the data
  - PI Data Archive supplies “data”
  - AF supplies structure and access across the “data”



# Asset Framework

## Analyses

- Efficiency analysis
- Key Performance Indicators (KPI)

## Time-series

- In-Flow
- Pressure
- Vibration data

## Events

- Downtime
- Startup
- Failure

## Asset details

- Name
- Model
- Manufacturer

## Notifications

- High speed
- Rotor failure
- Low pressure

## External data

- Performance curves
- Last maintenance date
- Design documents
- Best operating procedures

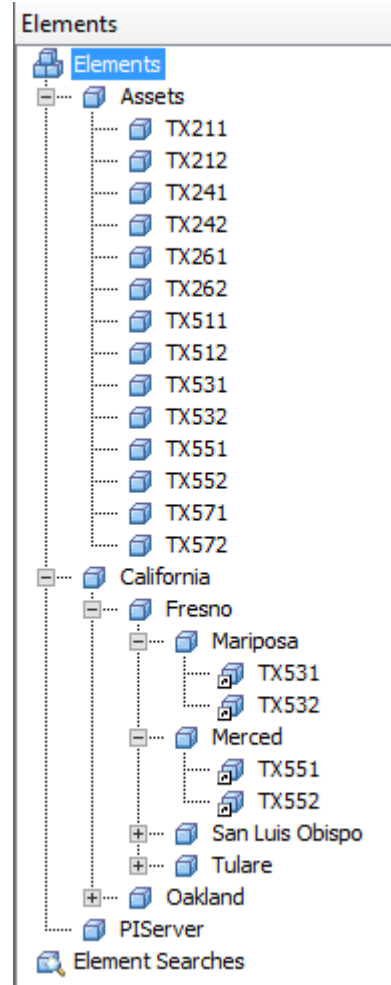


# Misconceptions

- There is a “Right Way” in building out the asset structure
- I have to build out everything at once
- Resources
  - Asset template examples on PI Square
  - Customer examples -  
<http://www.osisoft.com/templates/presentation-list.aspx?id=1818>

# Designing the hierarchy

- Group by geography or business units
- Group by asset types
- Group by problems you need to solve
- Use references for different “views”



# Elements and Attributes

- Elements
  - Physical object or logical entity
- Attributes
  - Properties of an element
- Use templates for standardization and scalability

Well1

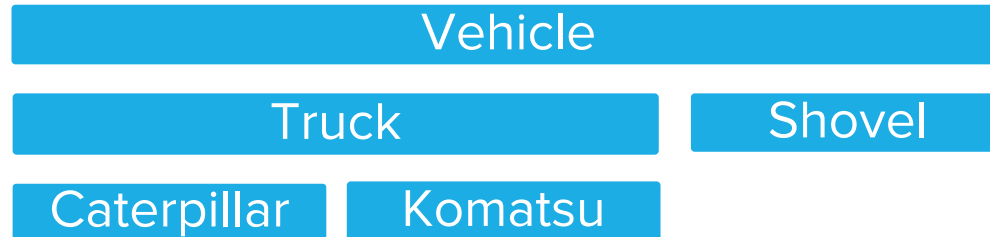
General Child Elements Attributes Ports Analyses Version

Filter

	Name	Value
Category: Location		
	Latitude	31.8633 °
	Longitude	102.3656 °
Category: Power Consumption		
	Power Consumption	56.0296424692635 kW
Category: Pressure		
	Bottom hole pressure	8566.92281345228 psia
	Casing pressure	1674.35956852248 psia
	Line Pressure	1293.01026221039 psia
	Tubing pressure	1205.05609722112 psia
Category: Production		
	30 Day Production Total forecast	261371.060310946 Mscf
	IP	830 mscfd
	P30	21073.7592401507 Mscf
	P60	42037.2686356412 Mscf
	P90	62993.2170116624 Mscf
	P180	125900.79756186 Mscf
	Production Rate	652.232350852449 mscfd

# Templates

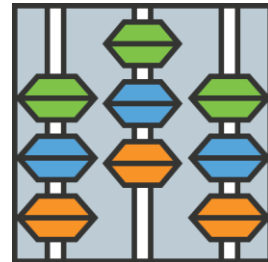
- How we define a particular class of objects
- These definitions are used throughout the PI System
- Auto-create PI Points to ensure consistency
- Use template inheritance to define attributes





# Analyses

- 150+ built in functions
- Use variables in expressions for readability
- Scheduled analyses should write outputs to PI Points
- Ensure PI Analysis Service has proper security
- Use analysis templates for standardization and scalability



# Event Frames (EF)



- Use EF to define important events for assets
  - Batch processes
  - Start-ups and shutdowns
  - Shifts & crew shift reports
  - Tests on operating equipment (e.g. well tests)
  - Downtime, curtailment, production loss tracking
- Use templates for standardization and scalability

# More Tools

- Use AF Tables to bring in external relational data
- Use categories as another way to index your information
- Take advantage of UOM Classes and conversions
- XML import/export can be used to build and move assets
- Reference types – defines relationships
- PI Builder is another tool for mass editing
  - Avoid single instances – use templates

# Deployment

- Factors affecting performance
  - Network latency between client and server
  - SQL Server
    - More RAM
    - Fast disks (IOPS)
- Data access
  - AF Server never talks to PI Data Archive
  - Optimize client to server connection

# Deployment

- Segregate PI Data Archive, AF Server, SQL Server and PI Analysis Service base on performance and IT requirements
- Be aware of SQL Server Express limitations
  - Single threaded
  - DB size (10GB)
  - RAM (1GB)
  - No AF audit tables
- Several AF High Availability options – consult OSIsoft tech support KB article



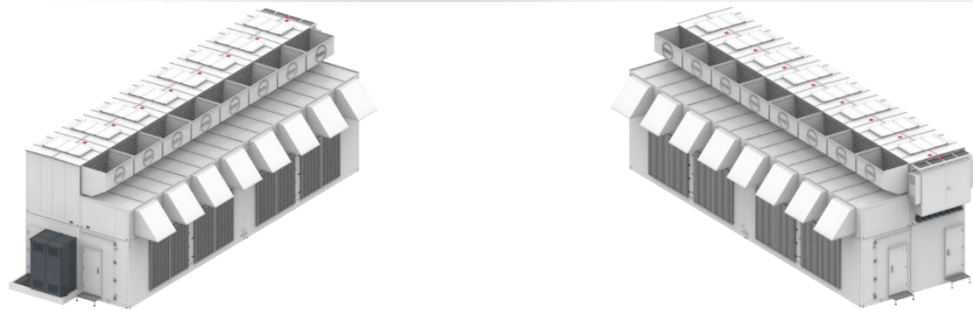


# Dell Experience

# Agenda

- What's a Modular Data Center (MDC)
- AF Capabilities Used
- Standardize, Simplify and Shorten MDC Deployments
- Process
  - Create points from table
  - Collect Commissioning data
  - PltoPI Commissioning data
  - Collect Production data

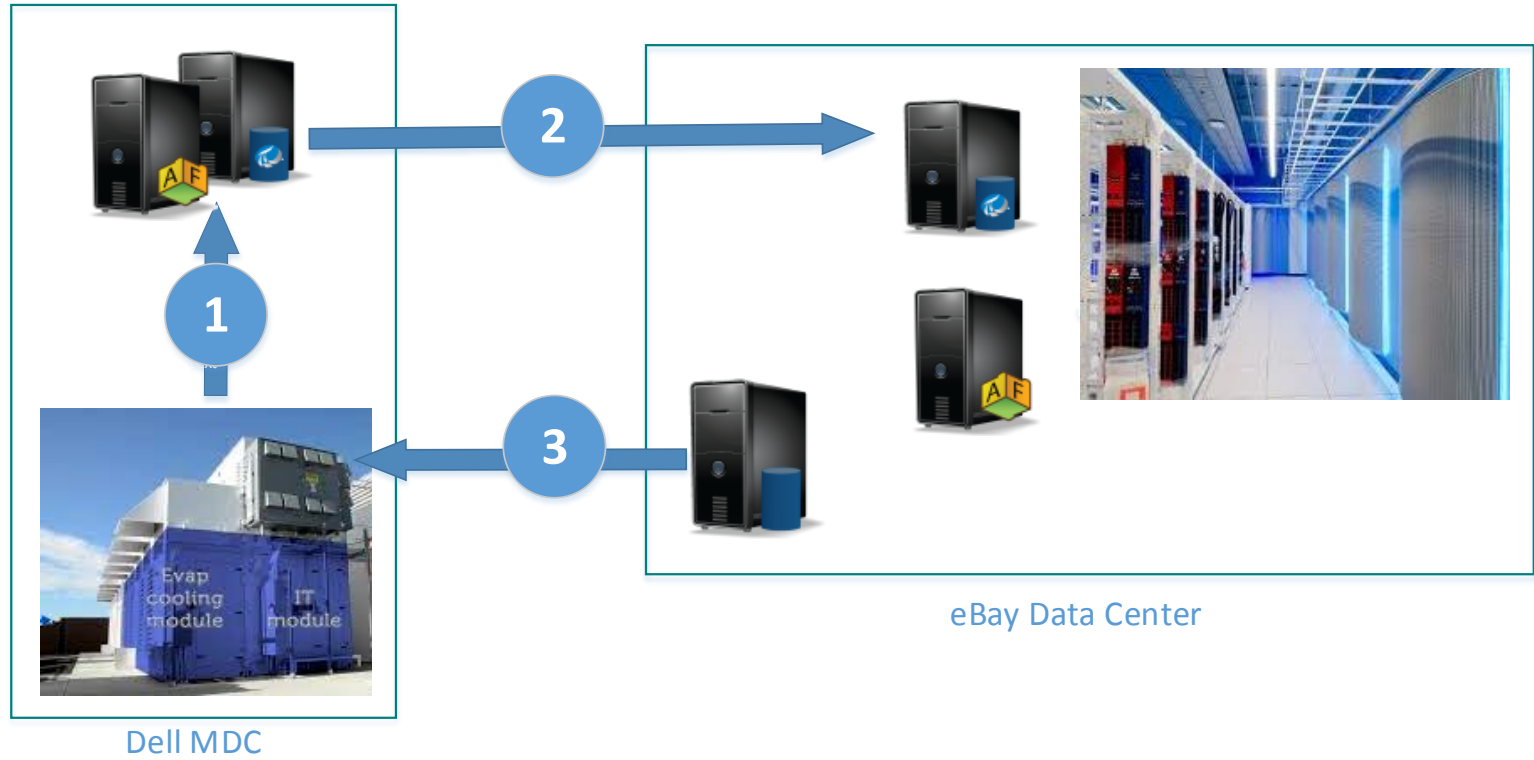
# What's an MDC?



- 100% free-air w/ evaporative cooling
  - Integrated switchboard
- N+1, concurrently serviceable and maintainable
  - 24-rack MDC
  - 50kW/rack
  - Redundant power to rack
- “Hot” removable racks for easy IT refreshes



# Process

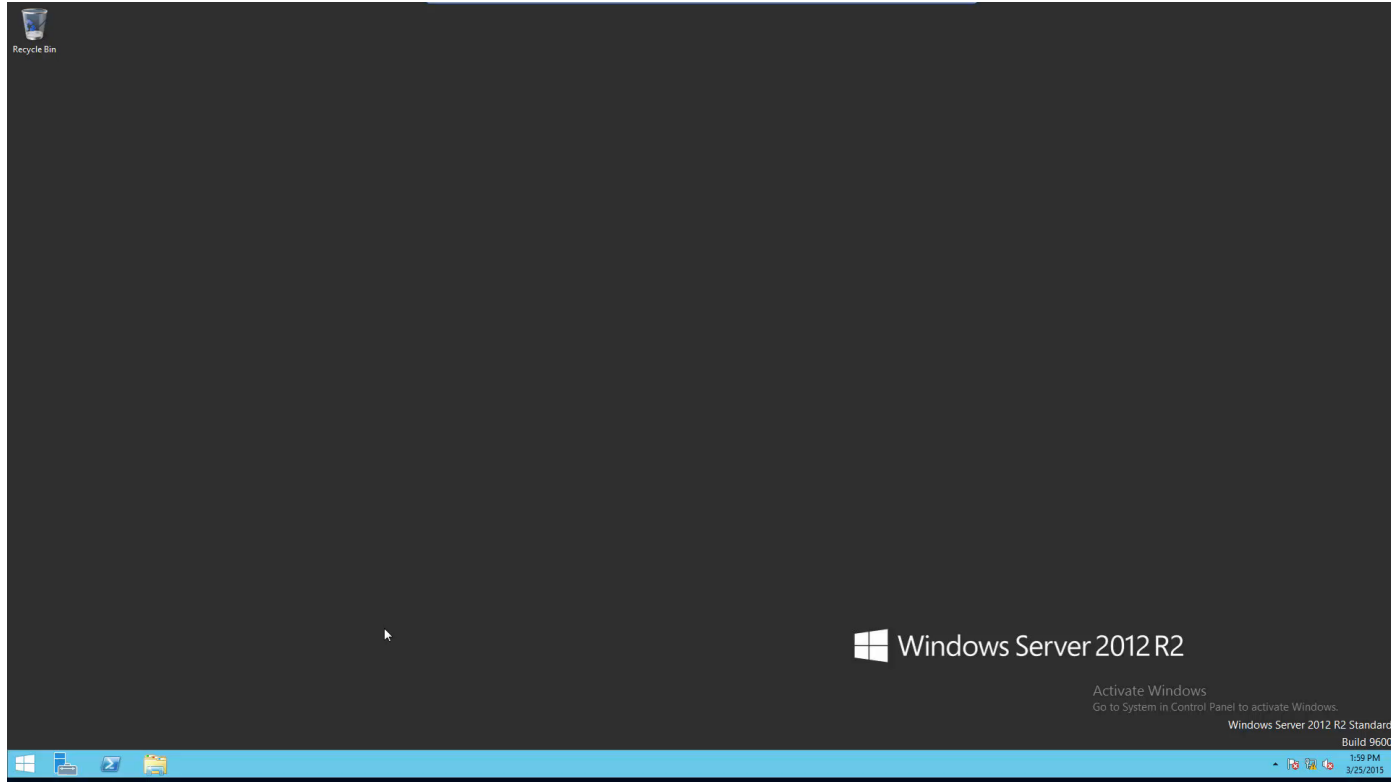


# Standardize, Simplify, Shorten

- Standardize
  - Single common XML file used for MDC Commissioning Data and Production Data
  - Reviewed and Approved by customer
  - Supports existing Tag naming conventions
  - Can be applied to existing installations
- Simplify
  - NO manual configuration of PI Tags
  - Best practices for tag tuning part of XML file
  - Modbus query optimization part of table definition
  - Easy transition of deployment tasks
  - Commissioning data now available as part of production data
- Shorten
  - MDC Production deployment shortened from weeks to hours.
  - Minimal validation since same XML source is used
  - Total duration and man-hours reduced



# AF Capabilities Used - Demonstration



# AF Capabilities Used - Demonstration

The screenshot displays the OSIsoft Epic8 PI System Explorer interface. The main window is titled "Airflow" and shows a hierarchical tree of data elements on the left. The tree is organized into folders: "SLC02", "Modular Data Centers", "MDC-189", "Electrical", "Automatic Transfer Switch", "ATS-1", "Low Voltage", "MDC-SWBC", "Air Handling Unit", "PowerMeter", "ATS-BYP-A", "ATS-BYP-B", "ATS-INPUT-A", "ATS-INPUT-B", "ATS-OUTPUT", "Main-A", "PowerMeter", "Surge Protection", "Main-B", "PowerMeter", "Surge Protection", "Server Outlet", "Life Safety", "Mechanical", "Air Side", "Chiller", "Fans", "Control Panel", "Commission", "IT Supply Air", "Outside Air", "Return Air", "Pumping", and "Water Side".

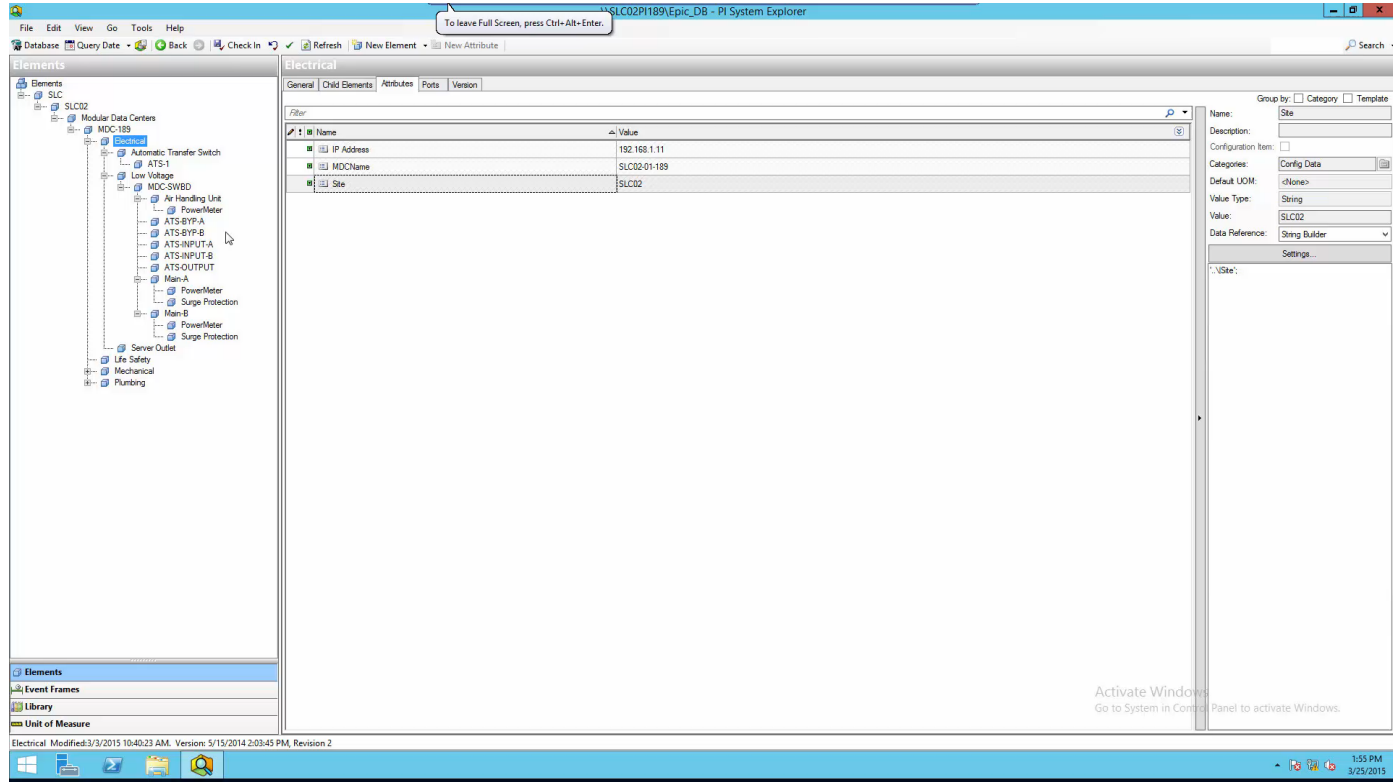
The "Airflow" table lists various data points with their names and values. The table has two columns: "Name" and "Value". The values are either "No Alarm", "0", "0.1%", "192.168.1.11", or "-0.5".

On the right side of the interface, there is a "Settings" panel for the selected element, "MDCName". The settings include:

- Name: MDCName
- Description:
- Configuration Item: ☐
- Categories: Config Data
- Default UOM: (None)
- Value Type: String
- Value: SLC02-01-189
- Data Reference: String Builder

The bottom status bar shows the file path "Airflow Modified: 1/13/2015 1:44:02 PM. Version: 1/1/1970 12:00:00 AM, Revision 5".

# AF Capabilities Used - Demonstration



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# Questions

Please wait for the **microphone**  
before asking your questions

State your  
**name & company**





THANK  
YOU

