



Best Practices for Using and Deploying the Asset Framework

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What does Asset Framework do for me?

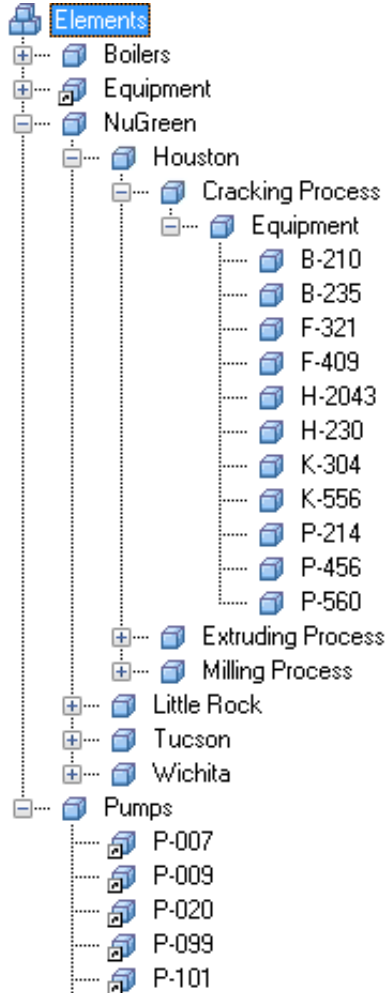


- “Data Dictionary”
 - Aggregate your data
 - Let’s you find the relevant information
- Unify disparate source systems – single version of truth
- Basis for comparison and collaboration
- Embed domain expertise
- Context for searching, analyzing and viewing data

The Value of AF: Structure



- The PI Data Archive is extremely good at:
 - Storing 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>



Before you start to “cook” – prepare “recipe”

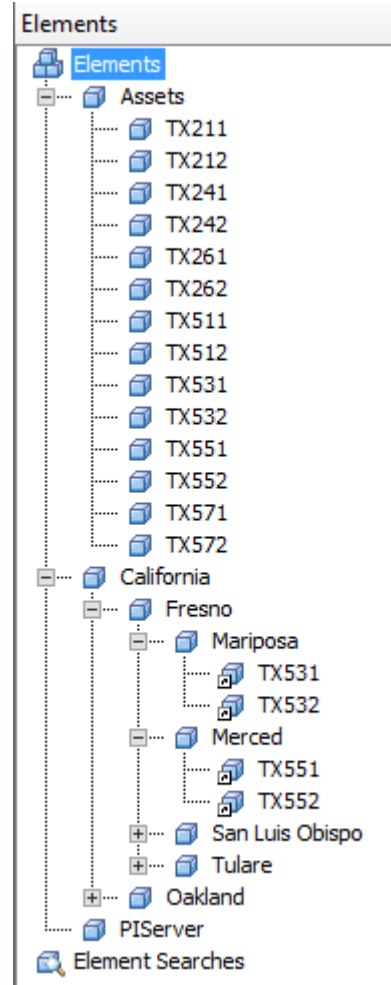
Look for one or two business cases to define:

- Critical assets
- Data sources of
 - Time series
 - Meta data
 - Structure
- Responsibilities for maintenance
- Workflow for changes



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

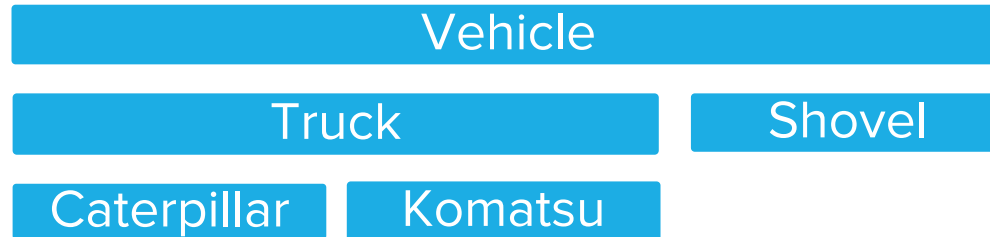
General Child Elements Attributes Ports Analyses Version

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

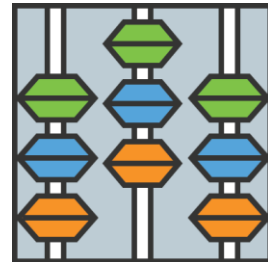
Templates

- 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

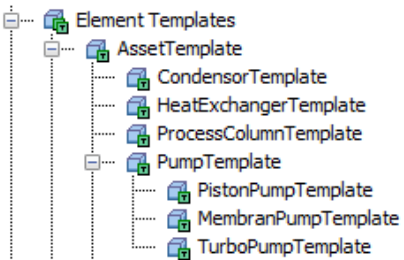
14 AF Commandments – Tablet ONE



1. All elements at the same level refer to the same type
 - hierarchy built should follow a standard approach, for example in S95
 - Enterprise at the first level, Site the second level, Area the third, etc.
 - Easier use of relative references from child-elements
 - Easier setup and maintenance, for queries for reporting and BI analysis.
2. All elements to be based on a template
 - even if the template has no attributes in the beginning
 - easier maintenance
 - additional dimensions for BI analysis
3. Categories for elements attributes and analyses
 - probably the fastest way to search for elements and attributes.
 - organizing large numbers of attributes/elements
 - When using event frames, you may have multiple referenced elements for the event frame, you can use categories to refer to a specific element for the attribute aggregation.
 - additional dimensions for BI analysis

14 AF Commandments – Tablet Two



4. Units of measure for the attributes
 - important for reporting
 - vital for calculations
5. Building views that are specific to users or equipment
 - use references
 - make queries on the views
6. Be careful using the default %Server%
 - when moving from a development server to the production server
 - better use explicit definition i.e. pointing to a configuration attribute
7. Use inherited templates.
8. Use all data references.
 - tables data reference allow you to access data interpolated and aggregated
 - Analytics allows you to use the attributes regardless where data come from.

14 AF Commandments – Tablet Three



9. Use Enumerations

- limit the choices that can be entered in attributes.

10. Try to use distinct element names

- less confusing for the users
- easier in tabular reporting

11. Use hierarchies of attributes.

- group details or aggregations on a different level

12. Keep relation data in relational database

- link AF tables to results and views
- use Cache and parameters

13. Don't use defaults

- write explicitly what you want (UOM, formula, server)

14. Be aware that in real life you cannot follow all commandments

ControllerMode

General

Name: ControllerMode

Description:

☐ Hexadecimal [Security](#)

Value	Name	Description
0	Manual	Manual Mode
1	Auto	Automatic Mode
2	Cascade	Cascade Mode
3	Program	Program Mode
4	Prog-Auto	Automatic Program Mode

Temperature	136.520889282227 deg C
1hAVG	134.044416387213 deg C
HighHighLimit	235 deg C
HighLimit	230 deg C
LowLimit	55 deg C
LowLowLimit	50 deg C
MaxStep	5 deg C

More Tools

- XML import/export can be used to build and move assets
- Reference types – defines relationships
- PI Builder is your friend for mass editing
 - Avoid single instances – use templates
- AFUpdatePlugInConfigurations.exe



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



2015 News

What's new in AF 2015 and 2015 R2



- Full support for future data, including analyses
- Excluded and Hidden attributes
- New security model – identities and mappings
- Case sensitive UOM (e.g. mW and MW)
- New functions for asset analytics
- Selectable saving or not saving analyses outputs
- Manual recalculation for event frames generation analyses
- Override output timestamps
- Improved event frames auto-backfill

Invitation

Feel Free to visit our POD

For discussion and Handson



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Questions

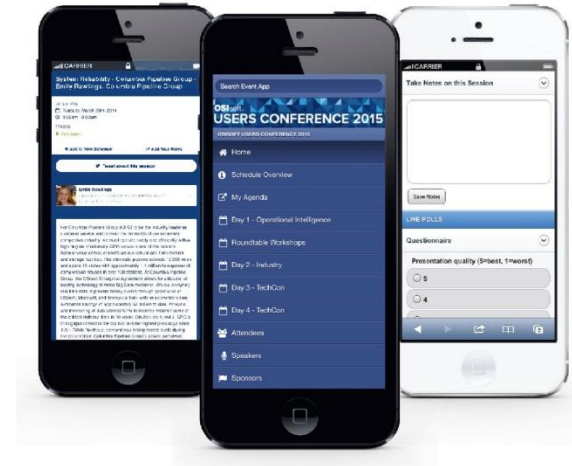
Please wait for the **microphone** before asking your questions



State your
name & company

Please don't forget to...

Complete the Online Survey
for this session



<http://eventmobi.com/emeauc15>



감사합니다

谢谢

Danke

Merci

Gracias

Thank You

ありがとう

Спасибо

Obrigado