Asset Centric PI System

PI Asset Framework
PI Event Frames
PI Notifications

Presented by

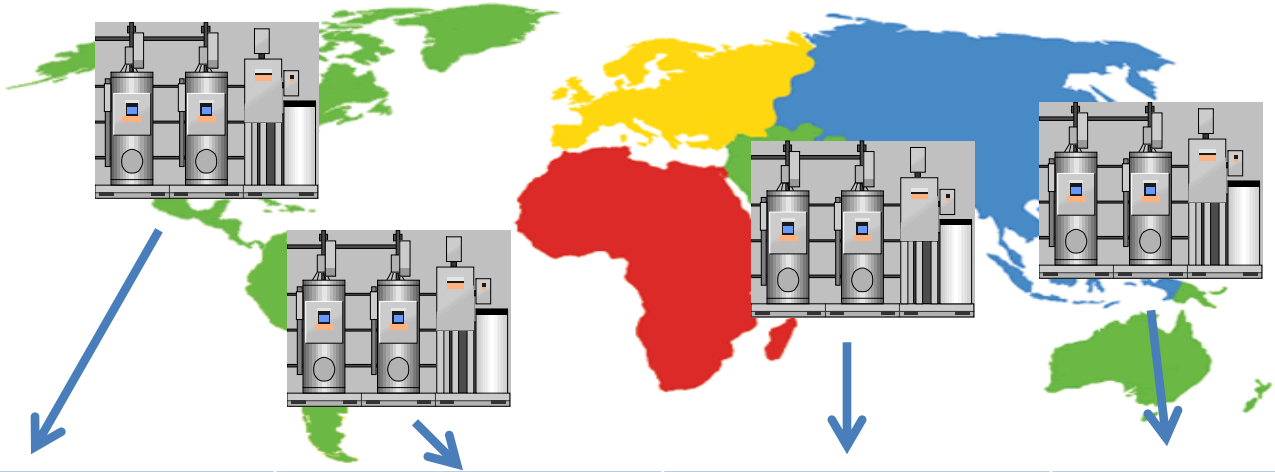
Stephen Kwan, OSIsoft

Business Challenges

- **Overwhelming amount of data from disparate sources**
  - Multiple disparate data systems
  - Diverse data types
  - Complicated, inconsistent naming, definition and structure
- **Make business decisions based on data and events**
  - Difficult to find the exception rather than the norm
- **Applying domain knowledge and expertise consistently**
- **Standardization across businesses**

People Think in Terms of Assets

Enterprise Companies Work Collaboratively



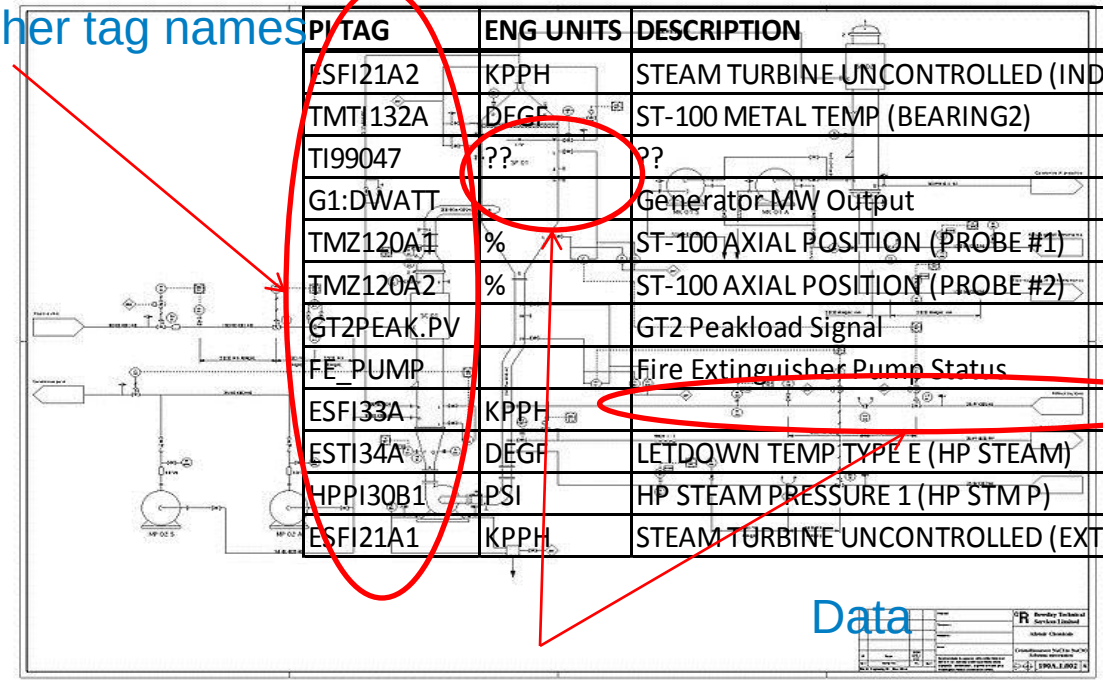
B1:TI333A.pV	\\CalderaA\temp	TE-BLR-996-R	\\BLR_N\MTR47
622 DegF	314 Deg C	611 K	288 Deg C

The process is the same …

The instrumentation is different

Relate Your Assets to Your Data

Difficult to decipher tag names



PI TAG	ENG UNITS	DESCRIPTION	MIN	MAX
ESFI21A2	KPPH	STEAM TURBINE UNCONTROLLED (IND FLOW)	0	100
TMTI132A	DEGF	ST-100 METAL TEMP (BEARING2)	0	400
TI99047	???	??		
G1:DWATT		Generator MW Output		
TMZ120A1	%	ST-100 AXIAL POSITION (PROBE #1)	-100	100
TMZ120A2	%	ST-100 AXIAL POSITION (PROBE #2)	-100	100
GT2PEAK.PV		GT2 Peakload Signal	0	1
FE_PUMP		Fire Extinguisher Pump Status		
ESFI33A	KPPH		0	425
ESTI34A	DEGF	LETDOWN TEMP TYPE E (HP STEAM)	0	1000
HPPI30B1	PSI	HP STEAM PRESSURE 1 (HP STM P)	-1	1550
ESFI21A1	KPPH	STEAM TURBINE UNCONTROLLED (EXTR FLO)	0	210

Data

Missing or incomplete data – difficult to find what you need

P&ID

Meta-data

- **PI Server is extremely good at:**
  - Collecting data from almost anywhere
  - Historization and playback of time-series data
  - Scale to very large size
  - Reliable
- **PI Server is focused on a points database**
- **Meta-data: a *structure* for the data**

Why Add Structure?

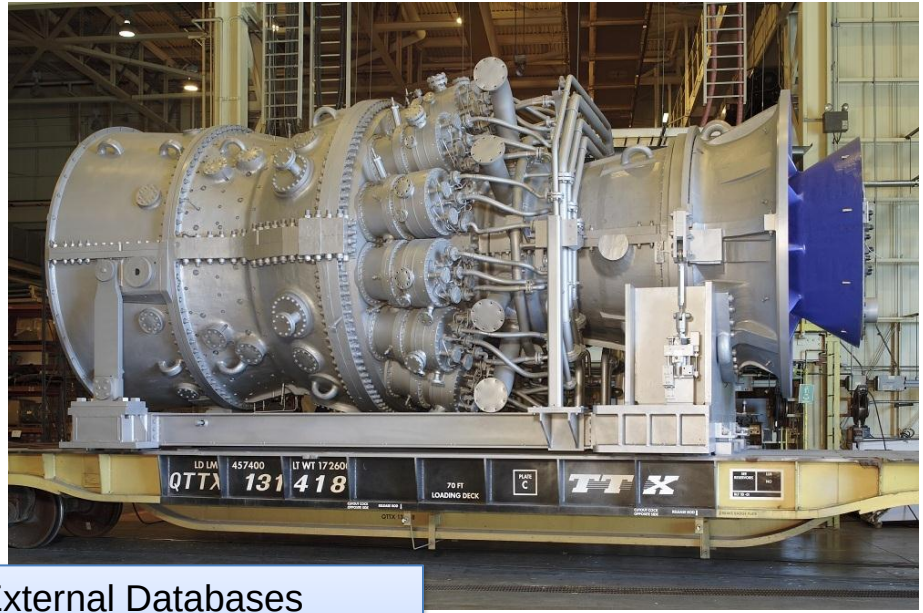
- **Structure is *your* knowledge applied to *your* points**
- **Structure helps you:**
  - Establish relationship between your assets and data
  - Capture domain expertise and share
  - Build applications
  - Answer new questions

PI Asset Framework (PI AF)

- **PI AF is part of the PI Server package**
- **PI AF provides an asset centric view of your plant**
- **Establish relationships**
  - Build hierarchies, categories and connectivity models
  - Relate asset properties to your disparate data
- **Standardize, common view**
  - Templates for similar assets
- **Work with your data by assets and events**
- **Apply domain knowledge via PI Notifications and analyzes**
- **Access your data via PI Data Access products**

Build a Complete Picture of Your Asset

PI Tags
- Inlet pressure
- Inlet flow
- Ambient temperature

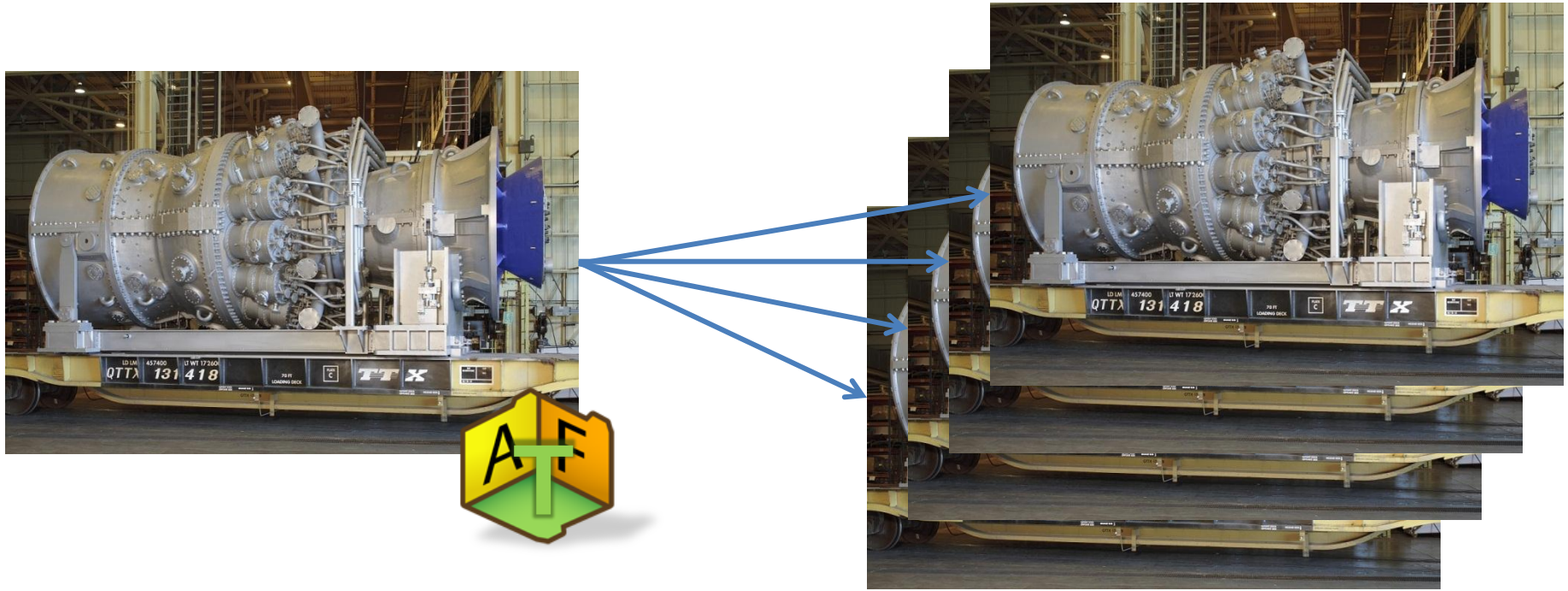


PI Tags
- Exhaust temperature
- Exhaust flow
- Measured MW output

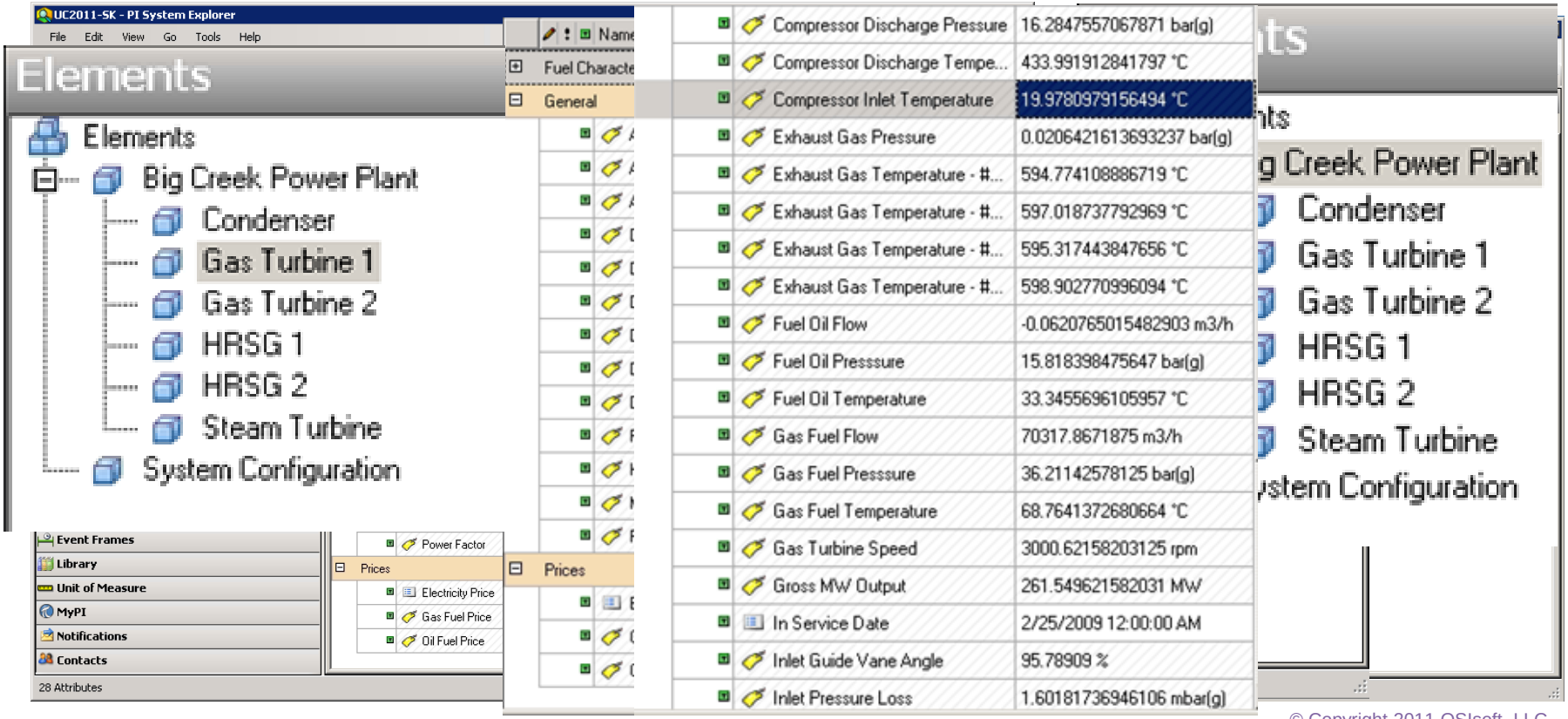
External Databases
- Performance curves
- Last service date
- Design documents
- Inspection best practice

Calculations
- Performance calculations
- KPI's

Common View for Similar Assets

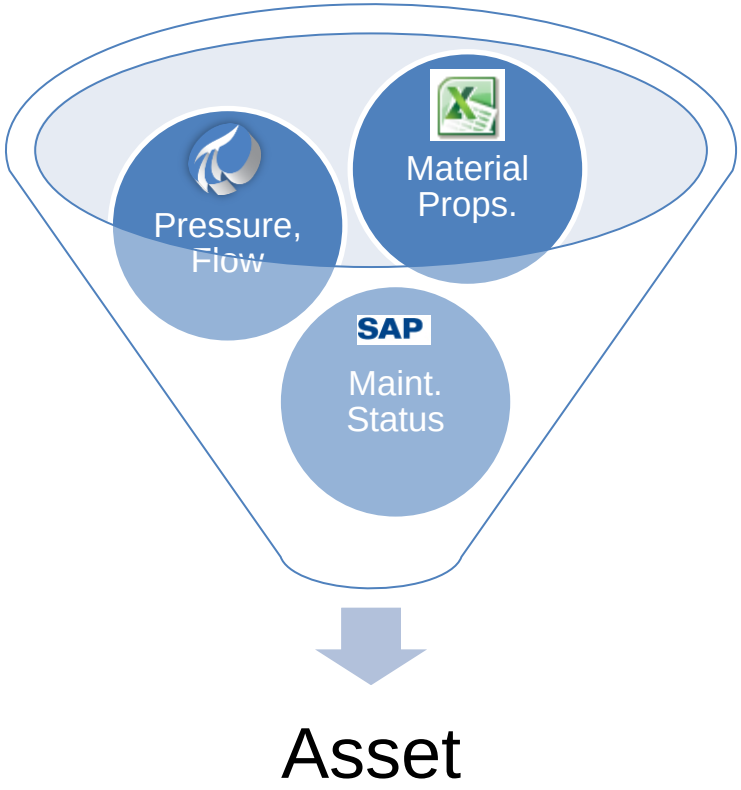


Add Value to your PI System

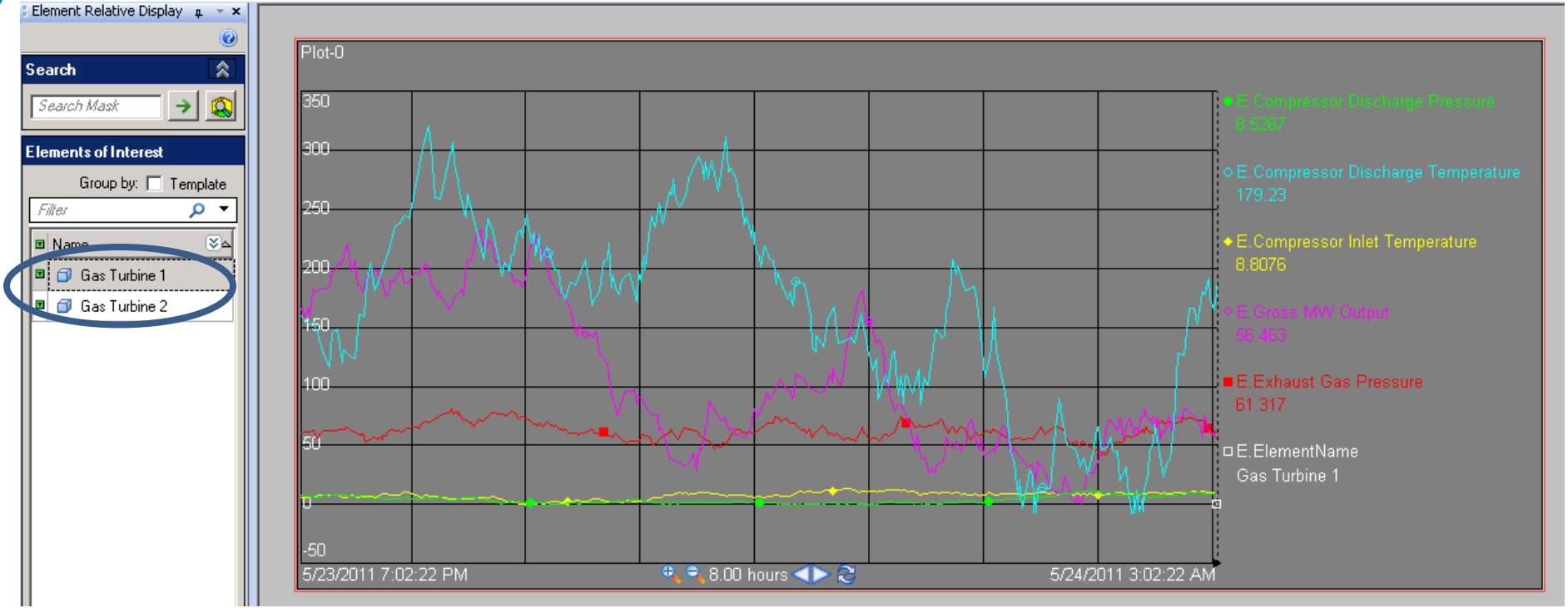


Add Value to your PI System

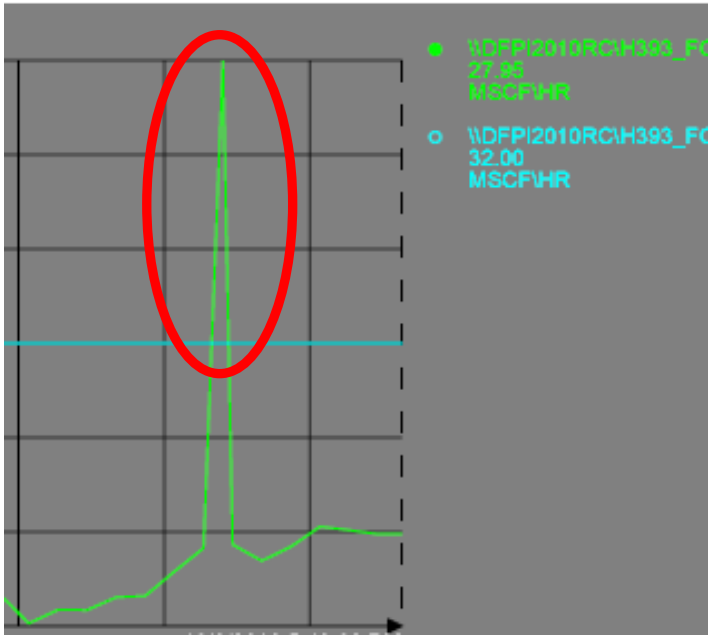
- **Tie asset properties to your data**
  - Static values, PI Tags from multiple PI Servers, static or linked Tables
  - Custom data references to other data sources

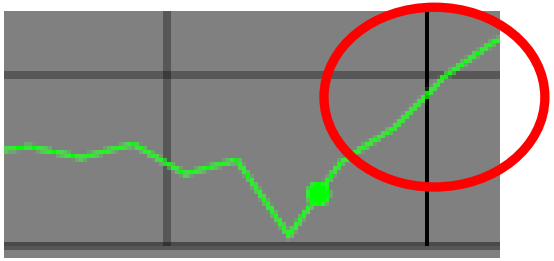


Build Once and Reuse for Similar Asset



Not Always Watching Your Data





Receive Information about Key Events

Microsoft Office Communicator 2007

Web Services

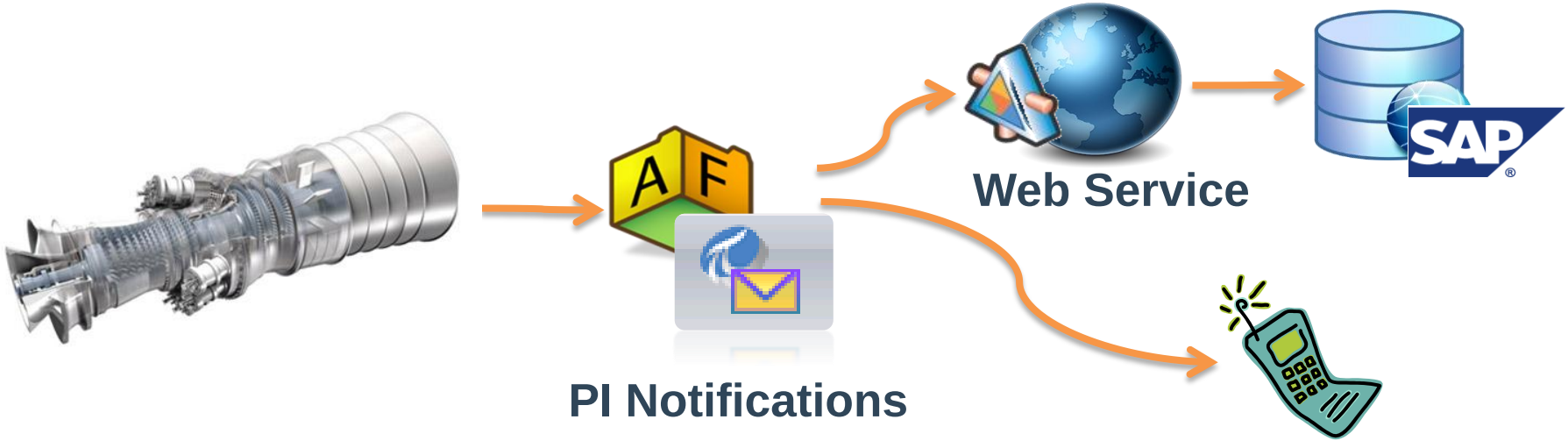
Other Applications

PI Notifications

- Identify insight that requires action
- Create trigger condition(s)
  - Comparisons, Performance Equations, SQC
- Specify information to be delivered
  - Customized for the recipient
  - Links to content
- Deliver to recipients, applications or systems when key events occur
  - Contacts or Windows users – Escalate if necessary
  - Email, web service, Office Communicator
  - Custom delivery channel

Add Value to your PI System

“One of GT exhaust thermocouples has been acting up… Let’s keep an eye on it and create a work order for maintenance if it fluctuates more than 5% in 5 seconds. Make sure Bob is notified of this also.”



Work with your Data by Events

Name = DT23032011-2

Start time = 23-Mar-2011 09:32

End time = 23-Mar-2011 09:50

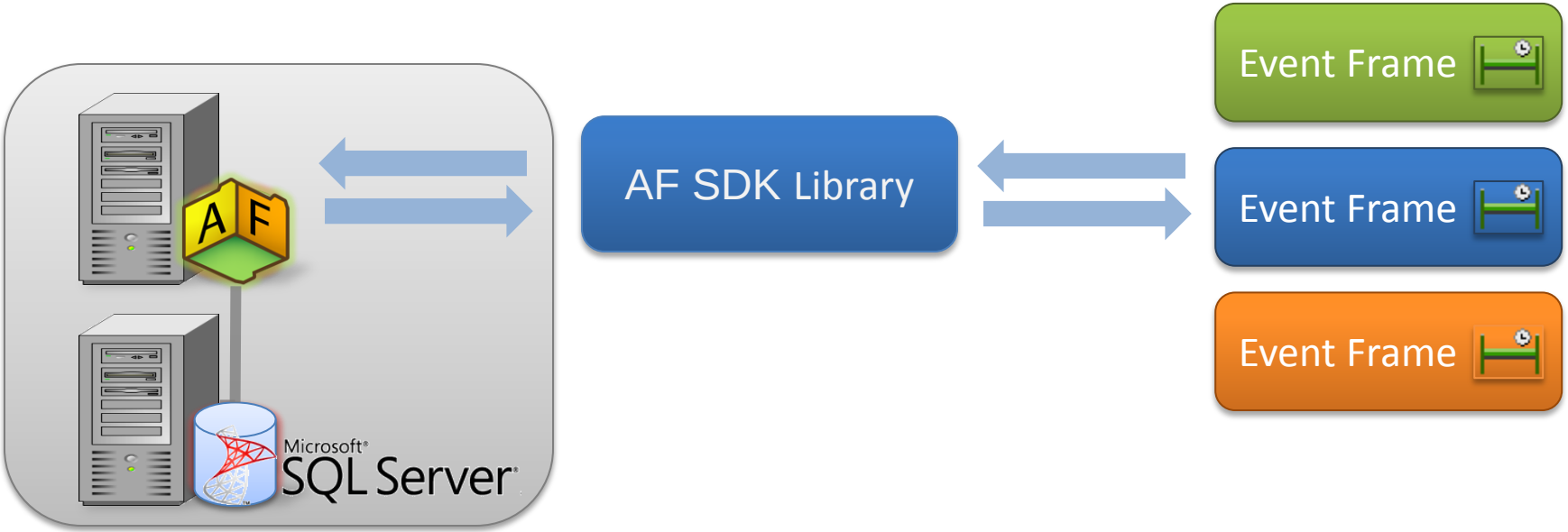
Asset = Boiler 3

Attribute = Mechanical

Attribute = Fuel line clogged

An Event Frame records important process or business events and helps you find the related real-time data.

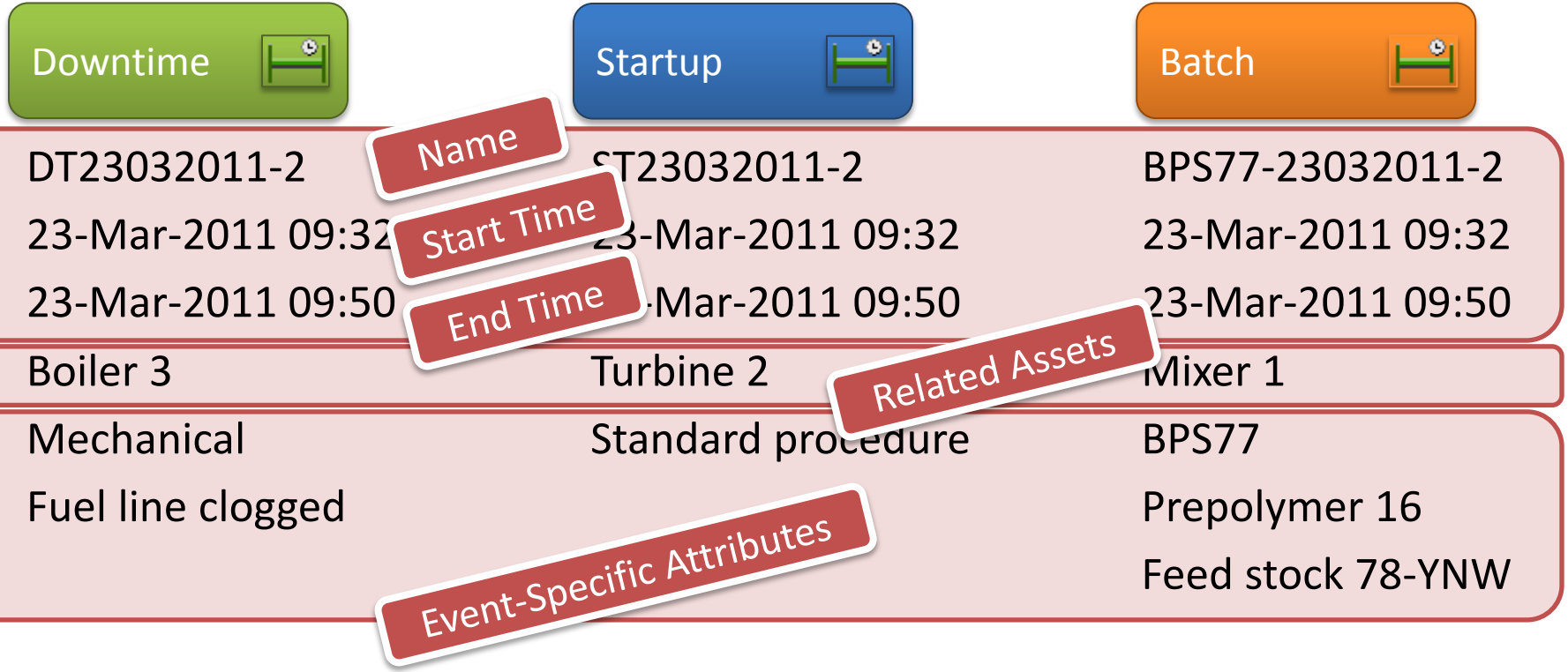
Event Frames are part of PI AF



What can Event Frames help you understand?

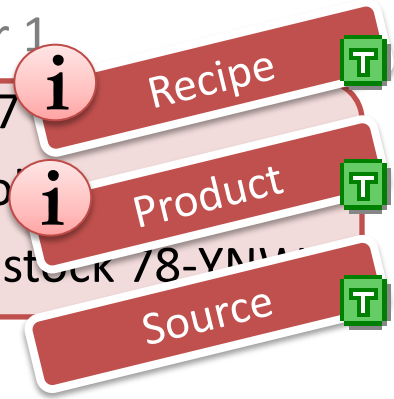
- Downtime and Overall Equipment Effectiveness (OEE)
- Excursions
- Startups, shutdowns
- Products (batch, mining, paper, etc.)
- Shifts, days

Different Events have Different Attributes



Different Events have Different Attributes

Downtime	Startup	Batch
DT23032011-2	ST23032011-2	BPS77-23032011-2
23-Mar-2011 09:32	23-Mar-2011 09:32	23-Mar-2011 09:32
23-Mar-2011 09:50	23-Mar-2011 09:50	23-Mar-2011 09:50
Boiler 3	Turbine 2	Mixer 1
Mechanica	Standard procedure	BPS77
Fuel line clogg		Prepo
		Feed stock 78-YN



Add Value to your PI System

- GT #2 tripped again last night!!
- How many times has this happened in the last year?
- What were the operating conditions when it tripped?
- Let's find and gather all these events and analyze them.

Downtime Events
- Asset of interest
- Start/End Times
- Reason Codes
- Asset Conditions

Benefits of an Asset Centric PI System

- **Common asset models and relationships**
  - Standardization across your entire enterprise
  - Benefit all users forever
- **Work with your assets and not points/tags**
  - No need to memorize point/tag names
- **Quickly and efficiently find the data you need**
  - Reference asset properties to different data sources
  - Search and find information across all your data sources

Benefits of an Asset Centric PI System

- **Combine disparate data in analyzes and reports**
  - Calculate KPI
  - Compare actual versus estimate
- **Build your solution once and reuse on all similar assets**
  - Element Relative Display in PI ProcessBook and PI WebParts
- **Empower other PI System components**
- **Expose your common asset structure and data via PI Data Access**

Thank you

Abstract

Asset Centric PI System

PI Asset Framework, PI Event Frames and PI Notifications

Speaker: Stephen Kwan, OSIsoft

Time: 30 minutes

Do you wish you can organize all your data from multiple PI Servers in an asset centric fashion, using names such as pumps, tanks motors, etc. instead of difficult to remember control system point names? Do you wish you can work with your data by events such as downtime or startup and shutdown rather than by individual points? Do you wish you would get notified of important changes to your PI System data automatically? PI Asset Framework (PI AF) with PI Event Frames and PI Notifications can help solve all these problems and then some. Come join us for an overview of these software and see firsthand some of the key features and functions and integration with the PI Server.