
REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE
RtPM
SAN FRANCISCO PHILADELPHIA HOUSTON FRANKFURT
OSISOFT USER CONFERENCES 2005
REAL-TIME PERFORMANCE MANAGEMENT FOR THE ENTERPRISE
RtPM

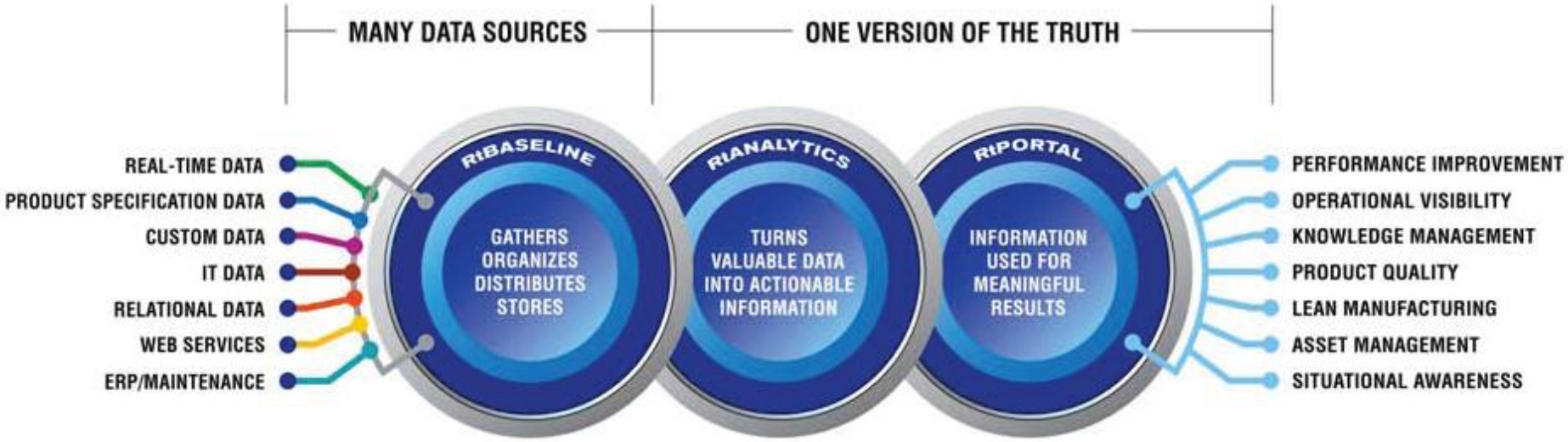

# Building Business Solutions Using the RtPM Platform

**Ray Hall**

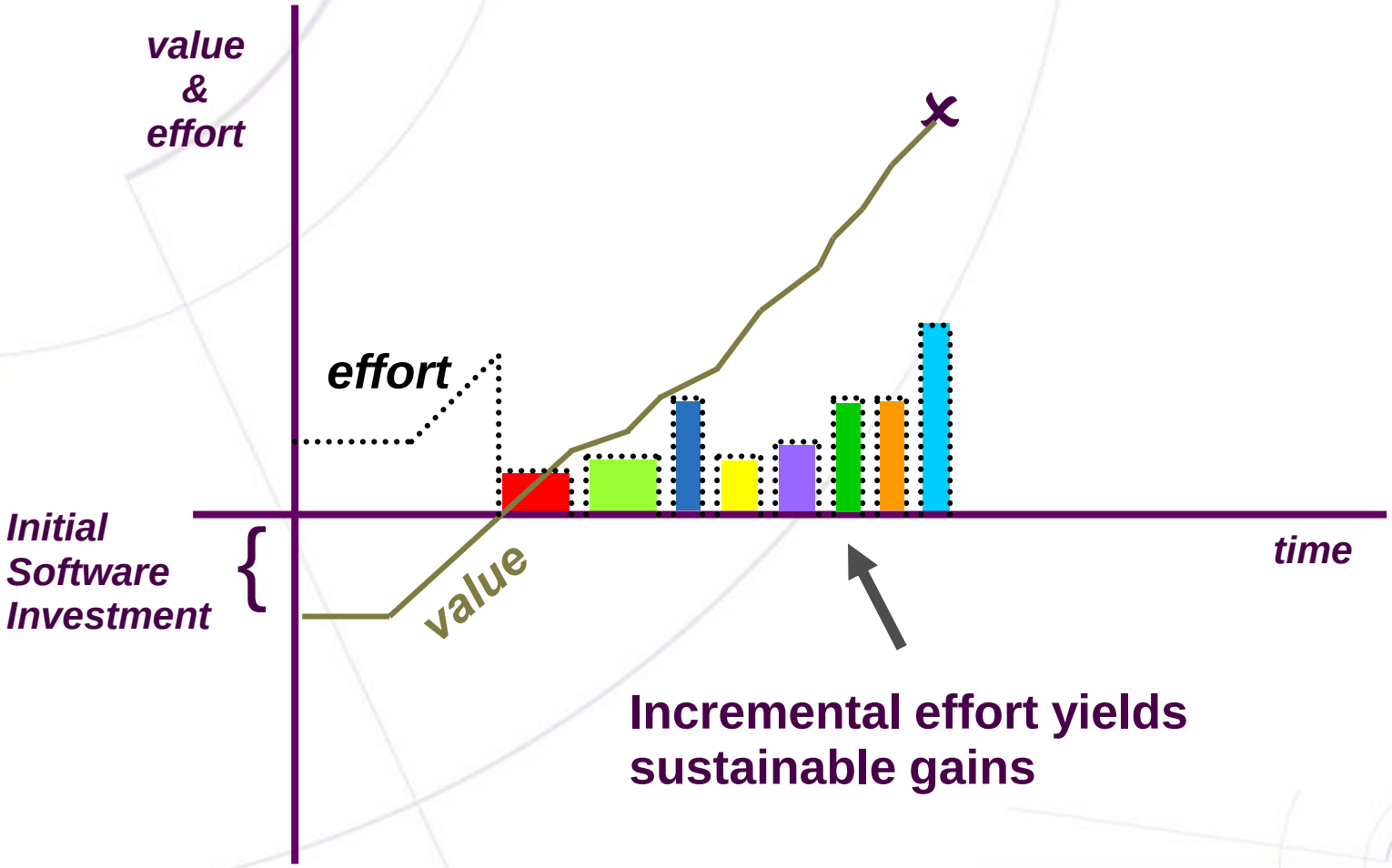
# RtPM is the Platform for Your Business Imperatives

- RtPM System Overview
- RtPM Integration Points
- RtPM Best Practices
- RtPM Example Incremental Gain
  - Standard Operating Conditions
  - Enterprise Data-Mart
  - Batch System of Record
  - Specification vs. Actual
  - Notification
  - Operating Conditions rollup

# RtPM Platform Overview

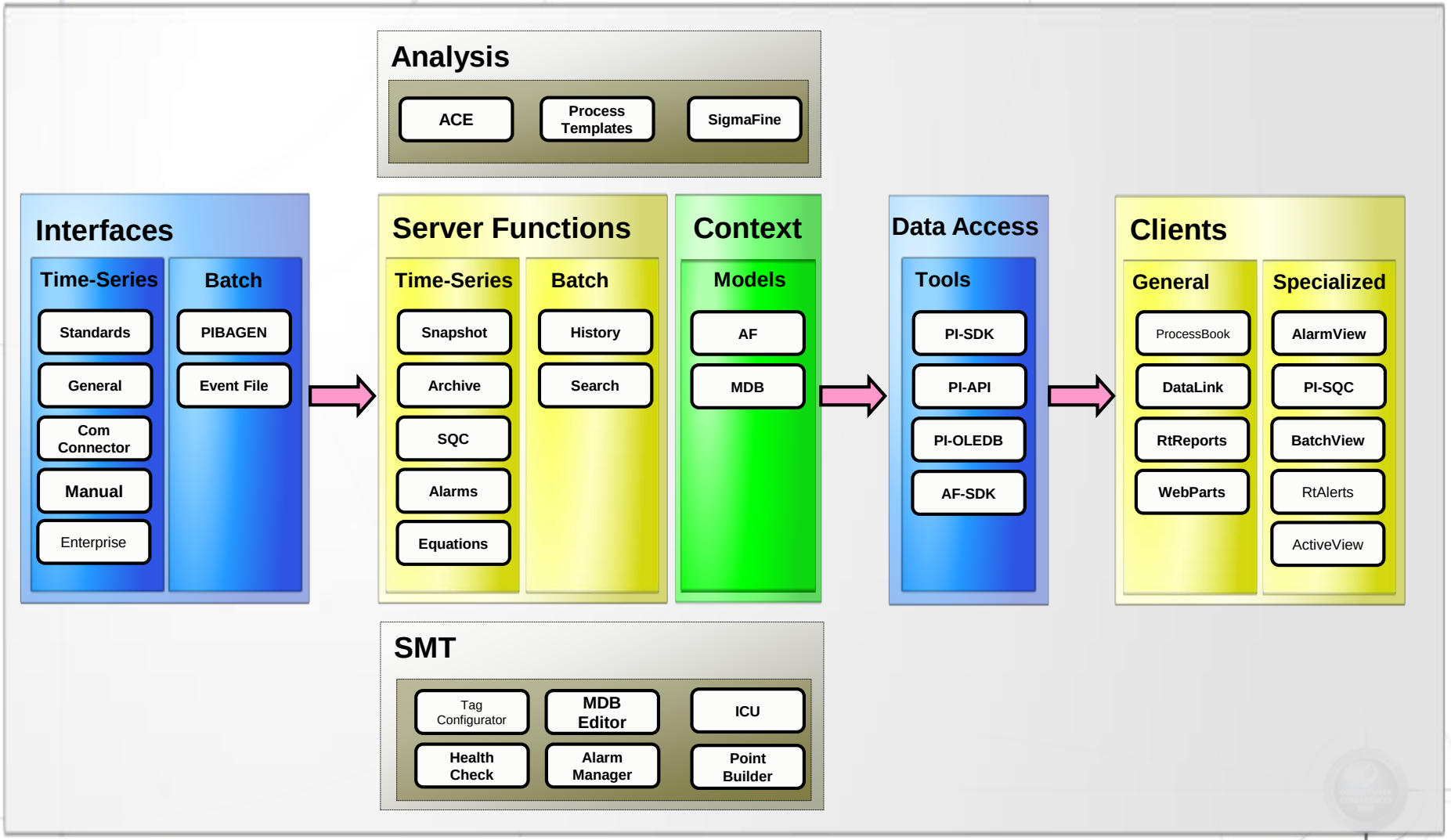


# Incremental Value Today

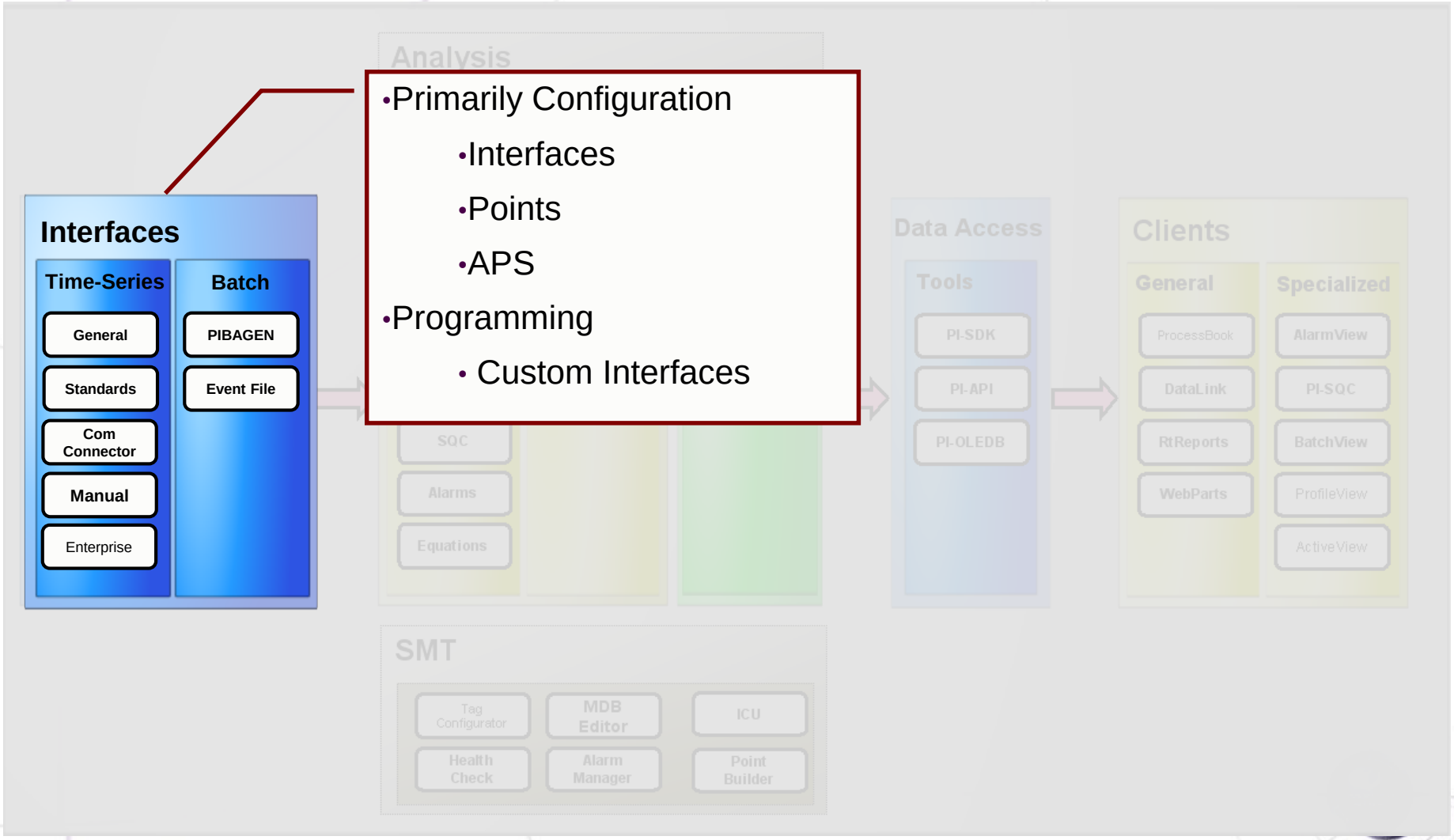



**Incremental effort yields sustainable gains**

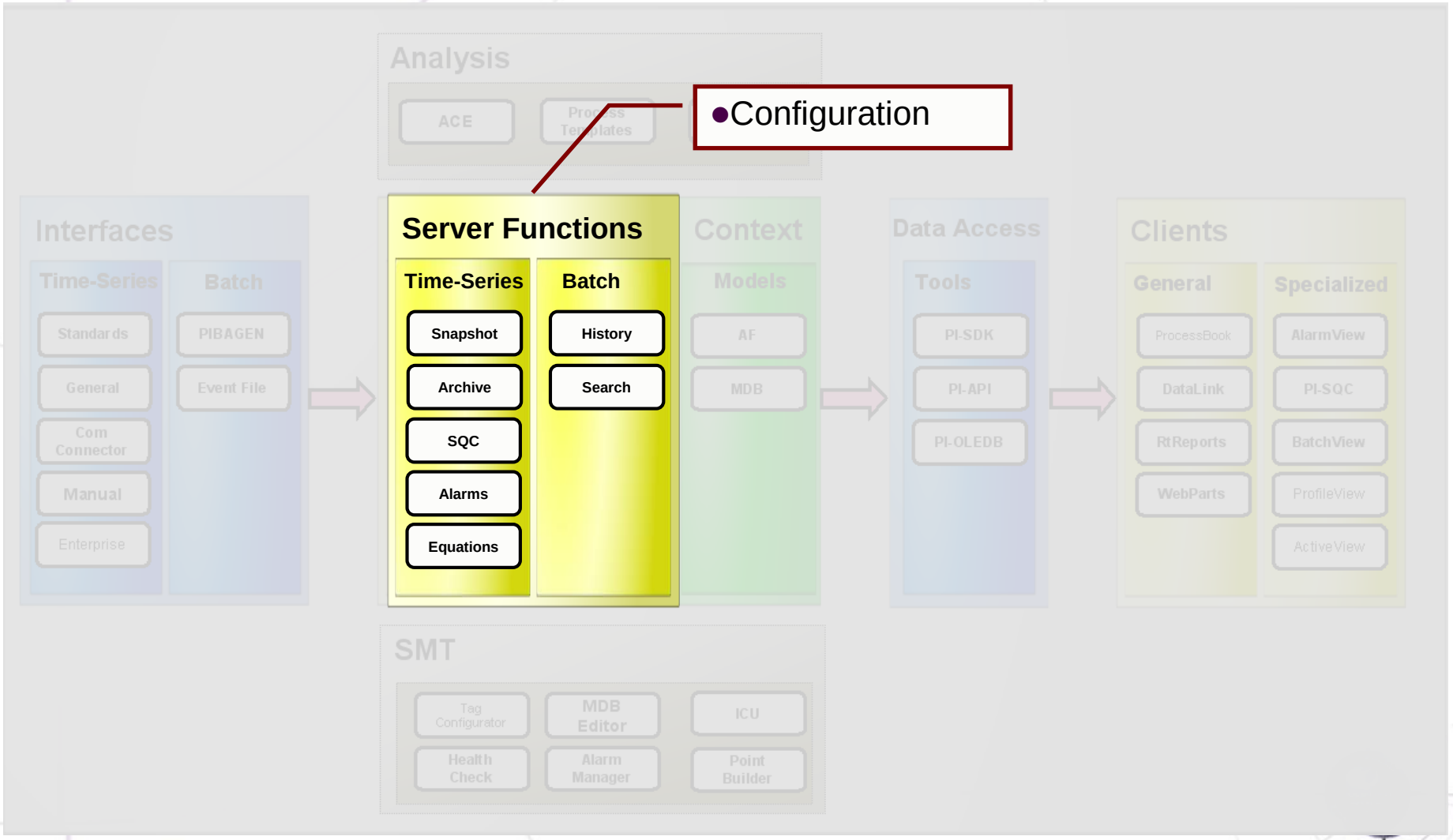
# RtPM System Review



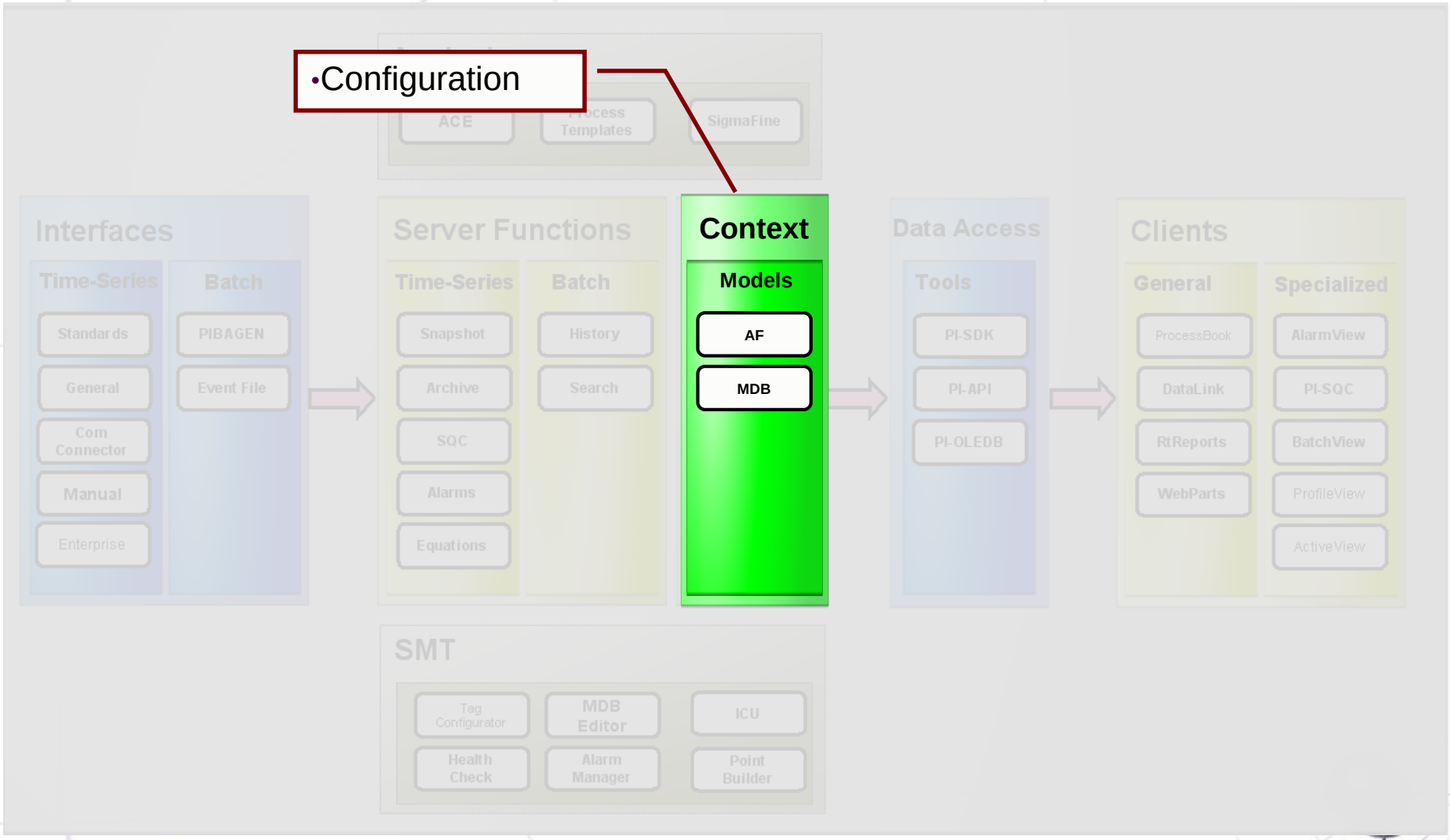
# RtPM System Overview: Interfaces



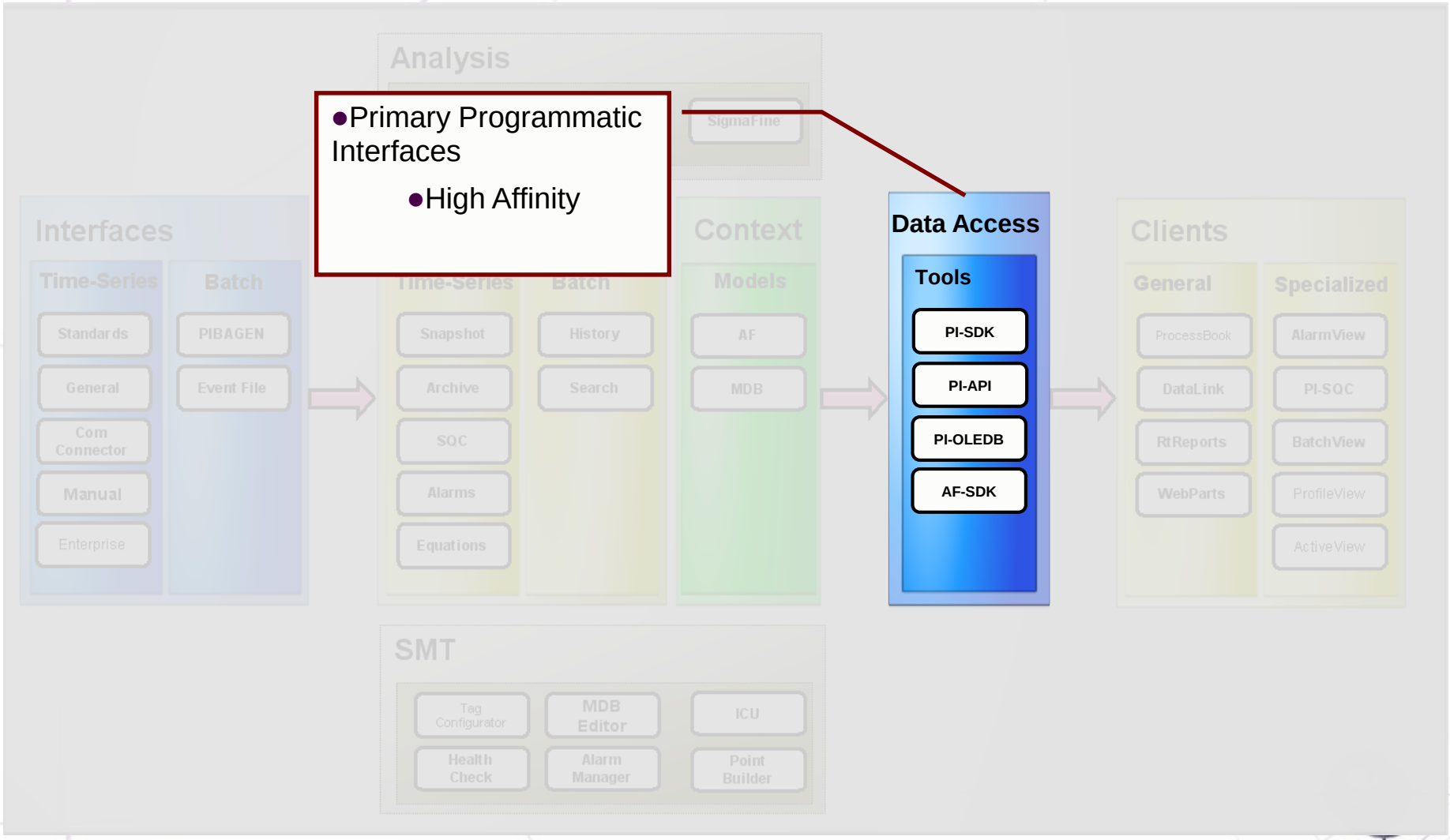
# RtPM System Overview: Server Functions



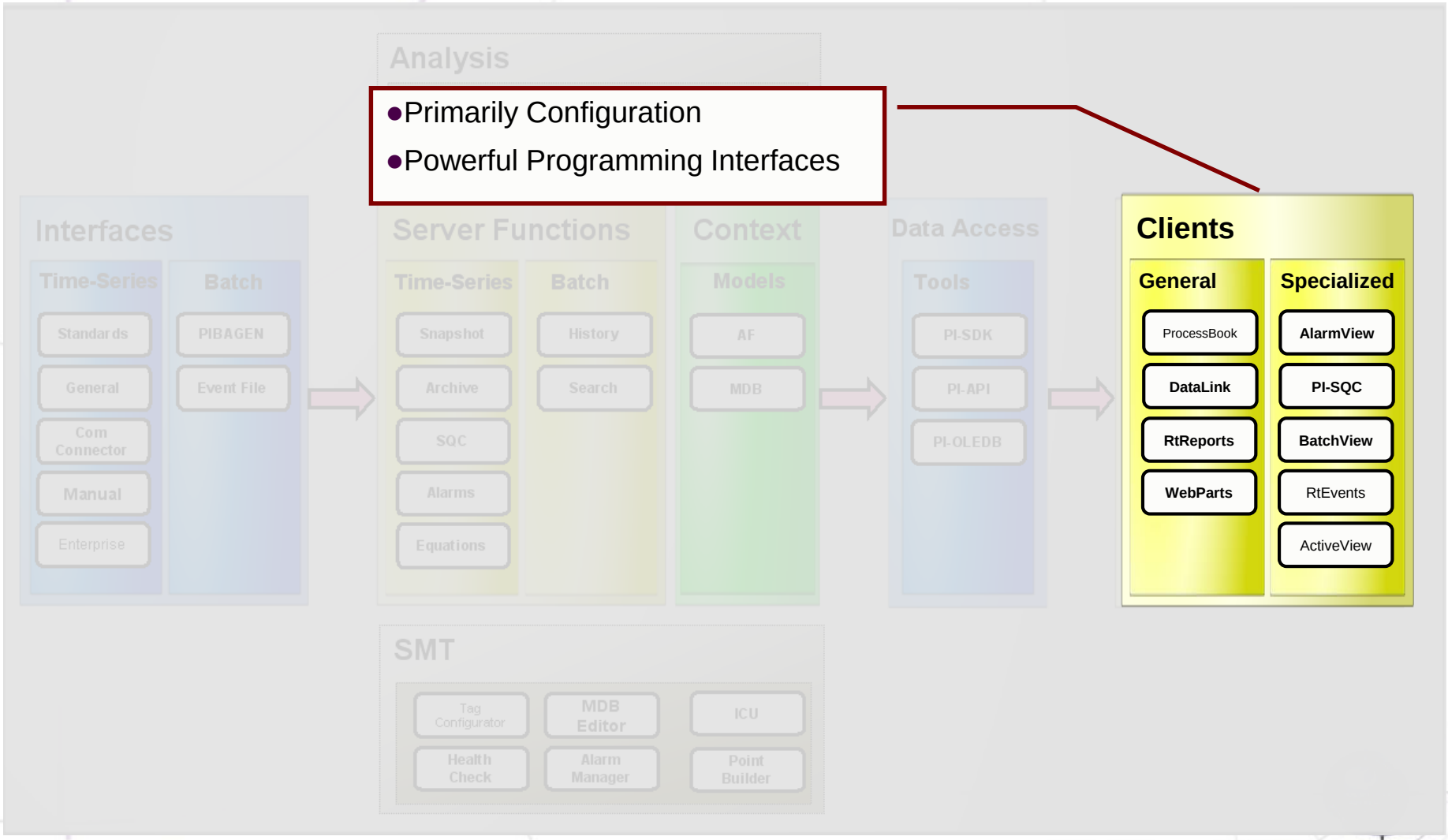
# RtPM System Overview: Context



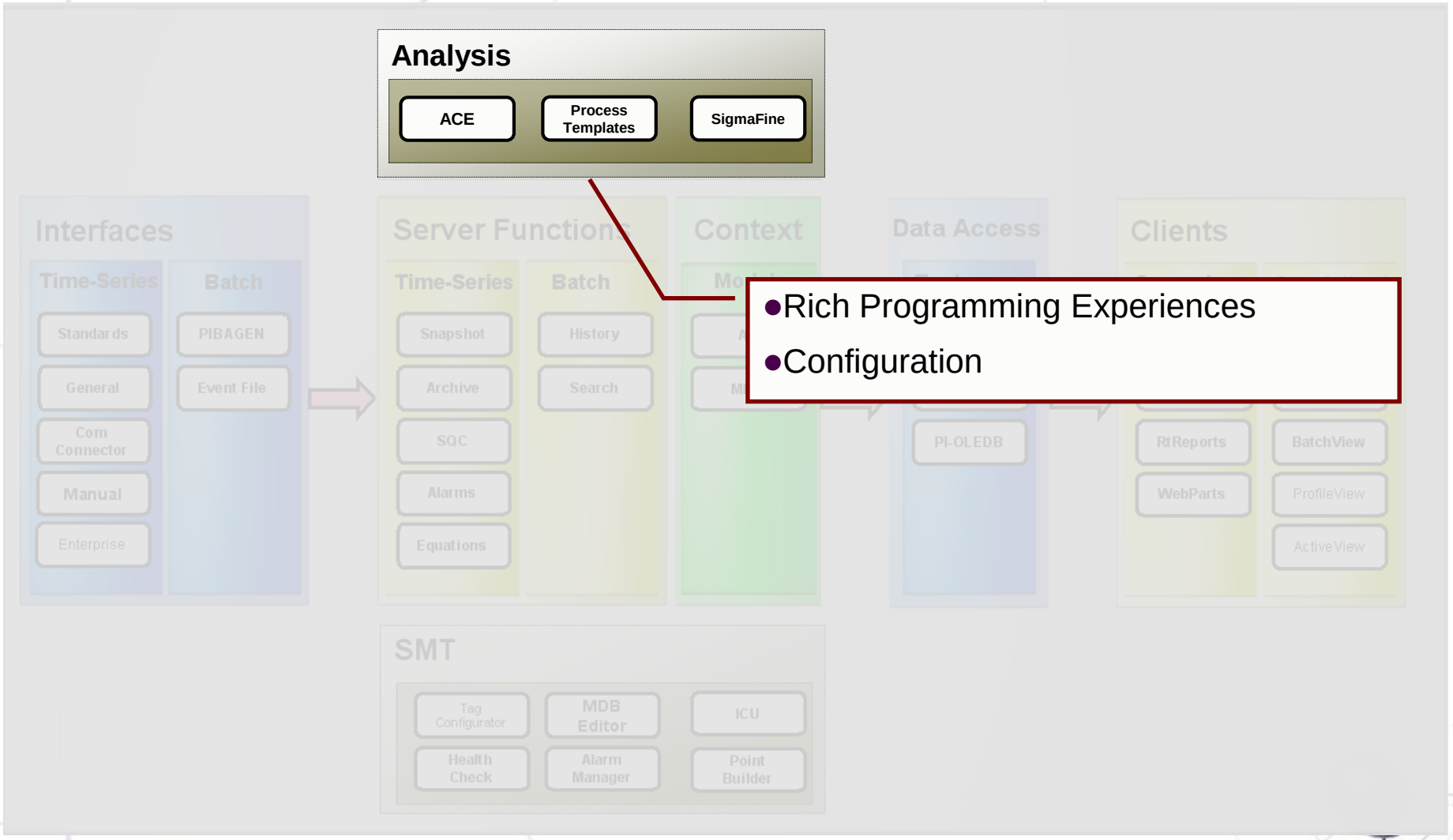
# RtPM System Overview: Data Access



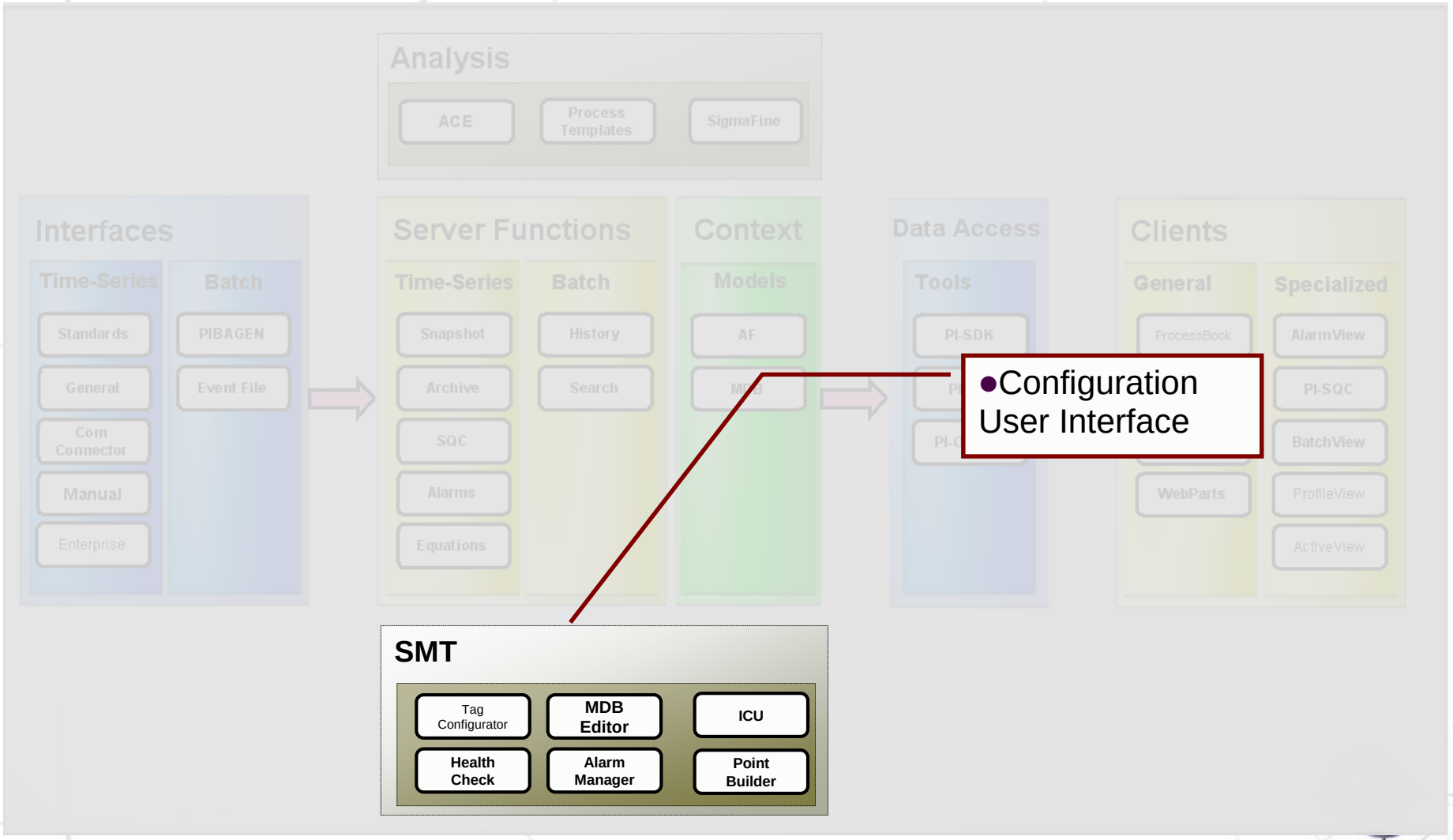
# RtPM System Overview: Clients



# RtPM System Overview: Analysis

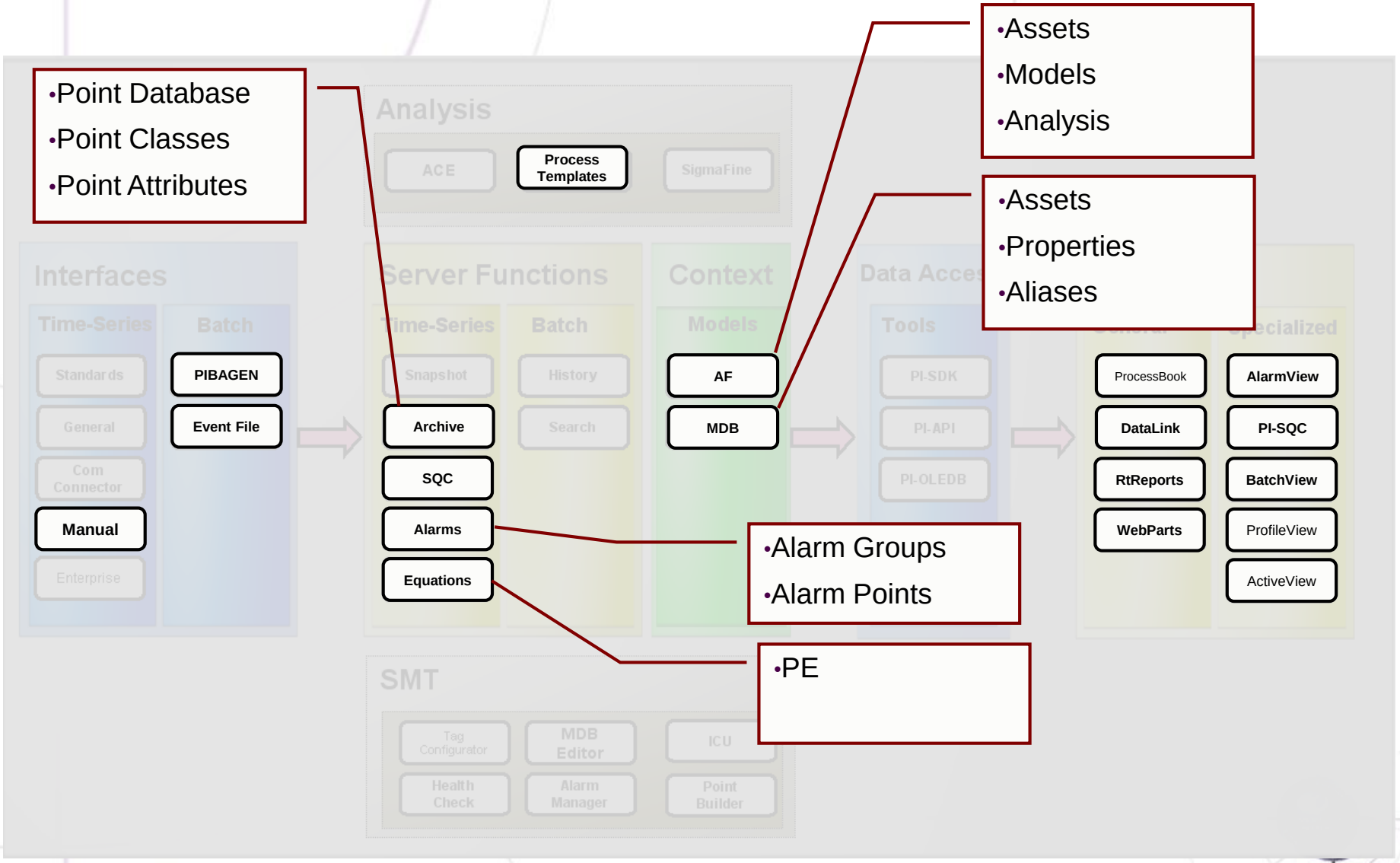


# RtPM System Overview: SMT

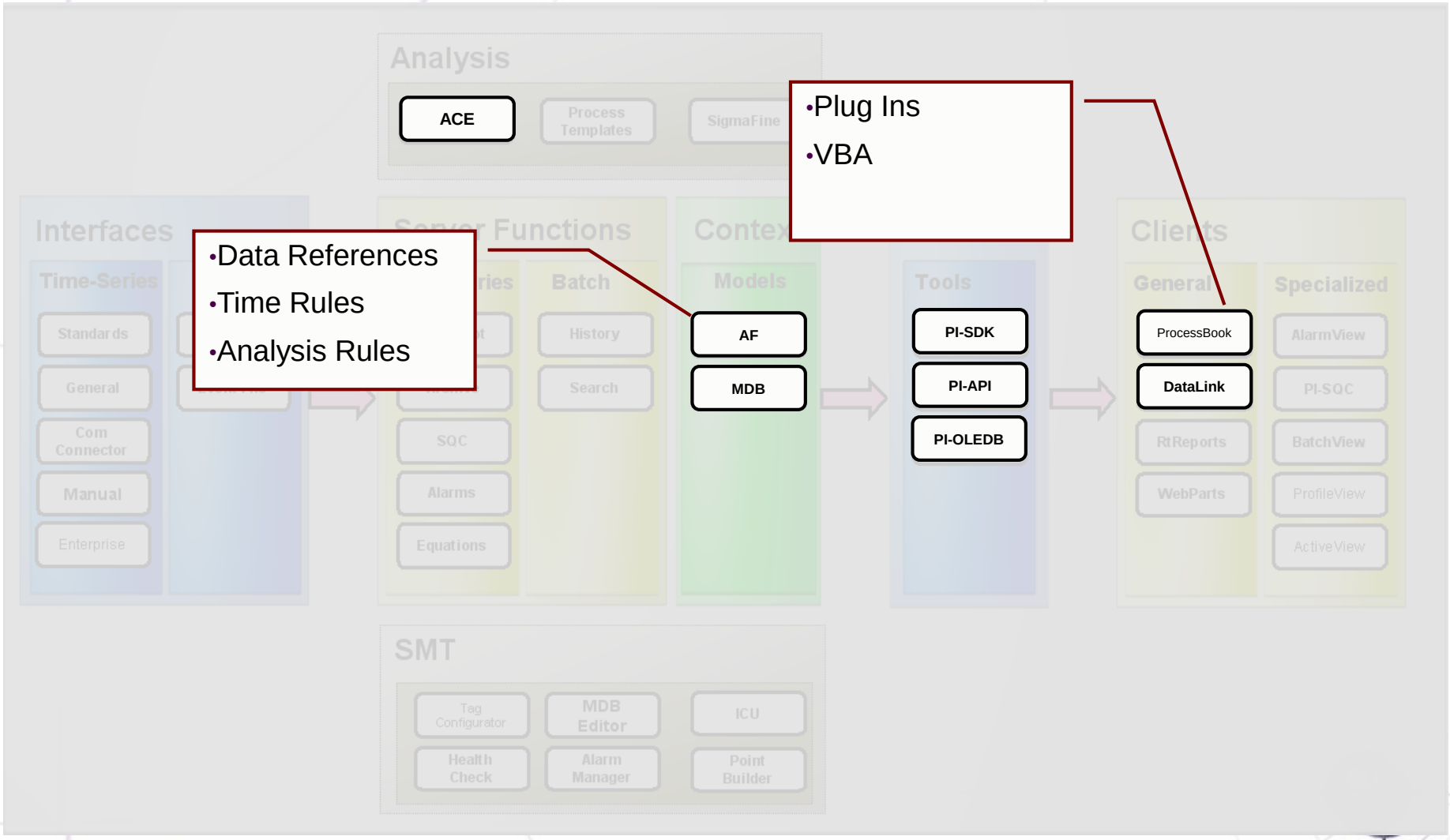



# RtPM System Integration Points

# RtPM System Overview: Sophisticated Configuration



# RtPM System Overview: Programming Interfaces




# Best Practices

# (Choice is good…right?)

# Best Practices: RtPM

- Configure
  - Easier to Maintain
  - Easier to Validate
  - Closer to End User
    - Promotes Knowledge Capture/Management
- Develop/Program
  - Farther Reach
  - The Danger of “A Small FORTRAN Program”
  - Commitment to Maintenance
  - Validation/Quality Require Commitment to Development Process

# Best Practices: Data

- PI API
  - Nostalgic for the 90's
- PI SDK
  - General programming environment, COM, Highest Affinity with PI, Batch
- PI OLEDB
  - Make data available to the relational client applications
- PI AF
  - Highest Affinity with AF/Foundation Database

# Best Practices: Context

- AF Database
  - Flow relationships
  - Models
- Module Database
  - Batch
  - Hierarchy
- Custom
- Impact of Foundation

# Best Practices: Calculations

- Performance Equations
  - Simple, configurable logic
  - Inputs are limited to that available to PI
- Totalizer
- ACE
  - Inputs from any system
  - Module-relative
- AF
  - Model-relative
  - Asset-relative
- Custom
- Impact of PIANO

# Best Practices: Reports

- DataLink
  - Environment Many Users Already Know
  - Simple
- RtReports
  - Regulatory Requirements or Approvals
  - Web
- Custom

# Best Practices: Alarms

- AlarmView
  - Hierarchical display
  - OPC alarms, reasons
- RtAlerts
  - Remote delivery (e-mail, pager)
  - Web
- Custom
  - Specific integration

# Best Practices: Web

- Active View
  - Needs VBA or ProcessBook Synergy
- RtWebParts
  - Concerns about deployment, client footprint
- Web Services
  - Participation in SOA
- Custom
  - Integration into existing system


# Business System Examples

# Example: Standard Operating Conditions

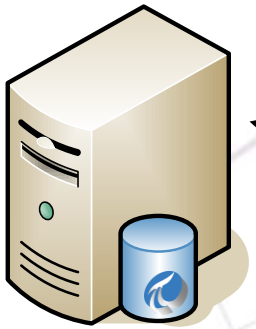
- Problem:
  - A way to measure operating performance against expectations
  - To summarize this based upon equipment hierarchy
  - A way analyze the problems to determine root-cause
  - To visualize this for quick analysis
  - Present Rules for “rollup” are predictable
  - Determine one “type” of asset
- Challenge:
  - Equipment is already defined in another system
    - And, this equipment is subject to change
  - Operating performance based upon limits from another system

# Example: Standard Operating Conditions

- Solution:
  - PI system to collect real-time data
  - Module Database to define a hierarchy
  - ACE programs to:
    - Read real-time values from PI
    - Read limits from external system
    - Calculate equipment performance
  - ACE programs to roll-up performance according to a hierarchy
  - Process Book screens to display the detail of each process unit

# Example: Standard Operating Conditions

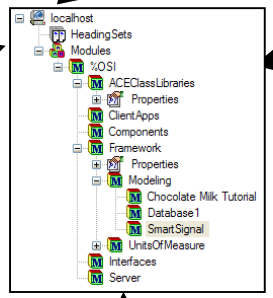
**PI Server 1**



**Aliased Points**

**Module Database**

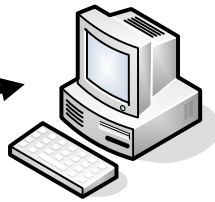
- Reflects Assets
- Exposes Aliases
- Contains Metadata

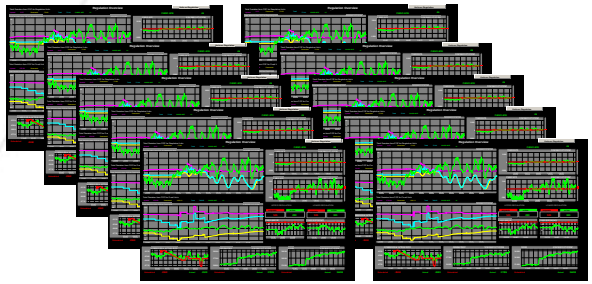



**ACE**

- Reads Aliases, Limits
- Computes Excursions
- Does Rollup

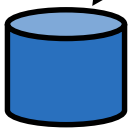
**Client**





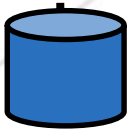
Screens for each Asset type

Manual Maintenance



**External Database**

- Limits



**External System**

- Asset Model

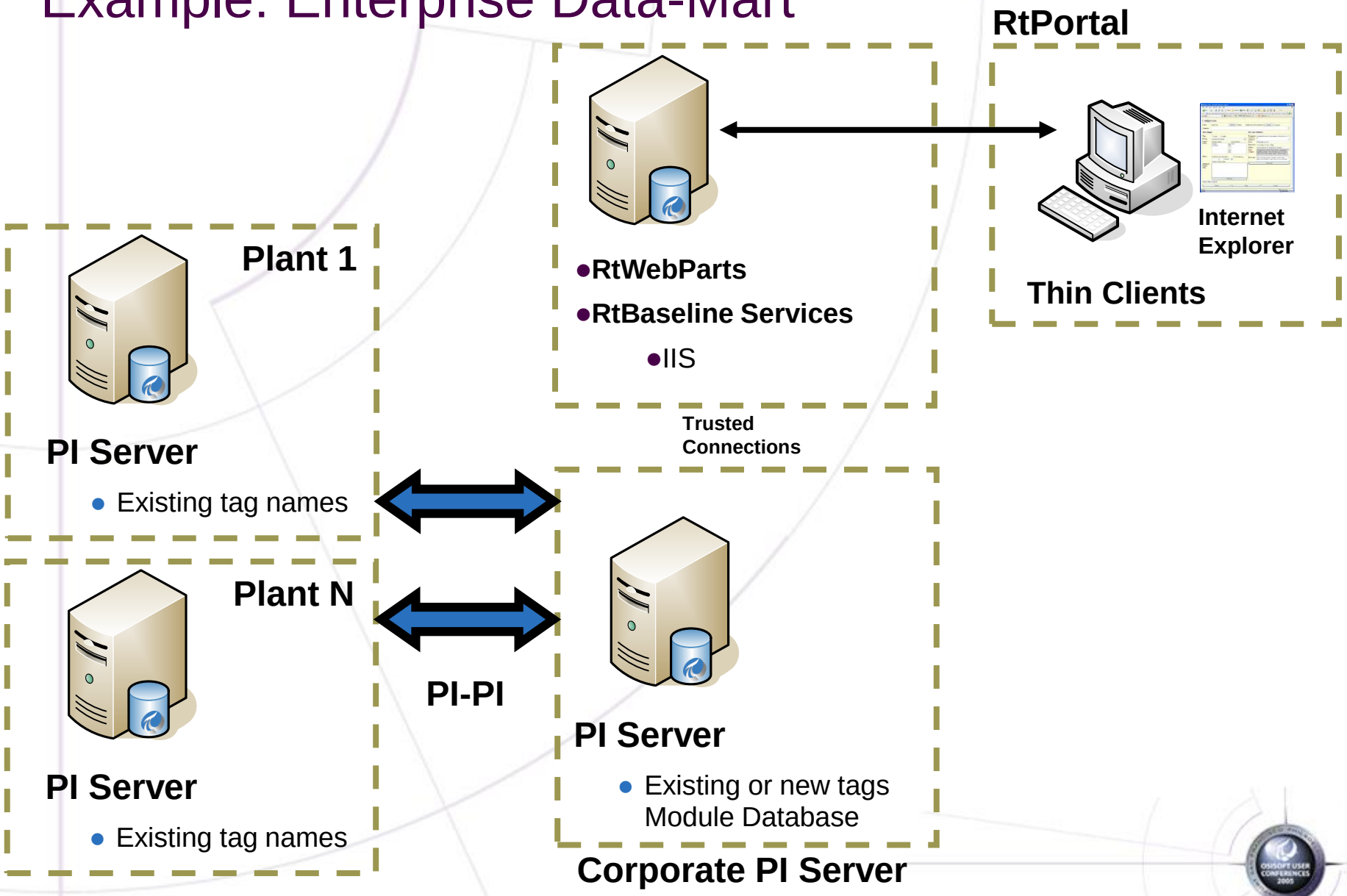
# Example:  Enterprise Data-Mart

- Problem:
  - Multiple Sites, without a consistent tag structure
  - Want to provide consolidated access to these systems to a wide variety of users
  - Want to put all the systems into a common model
  - Want to have applications that are common across the sites
  - Do not want to load the individual systems

# Example:  Enterprise Data-Mart

- Solution:
  - PI System at each plant
  - PI System at a corporate site
  - Move the data to the corporate site
    - PI-PI interface today
      - (Coming: PI System replication)
  - MDB hierarchy to organize the points
    - Use Aliases to make all data consistent
      - (Coming: Foundation project for modeling)
  - RtWebParts for broad exposure of the data

# Example: Enterprise Data-Mart



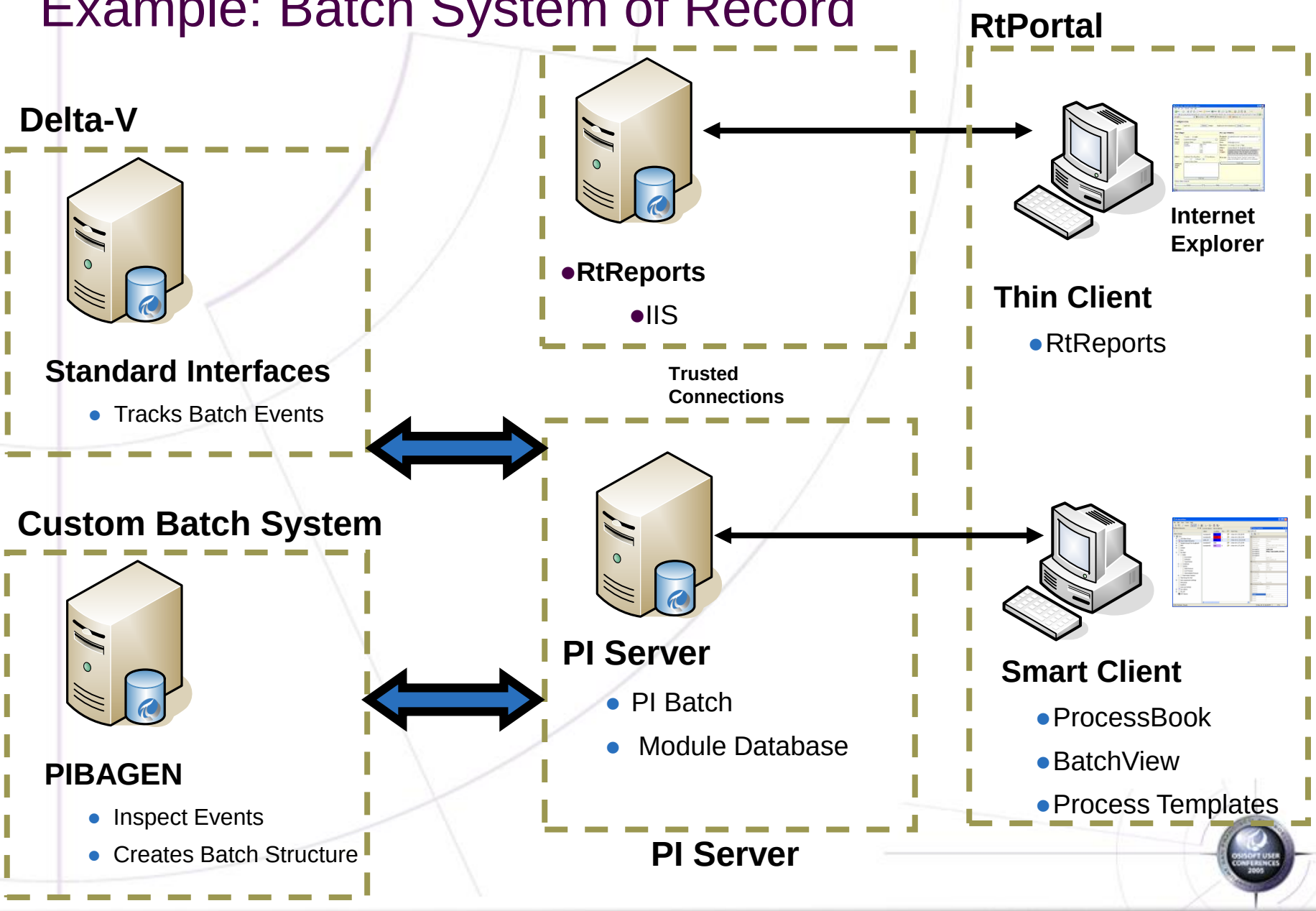
# Example: Batch System of Record

- Problem:
  - Manufacturing in batch processes
  - Currently using several batch control systems
  - Need a common real-time view of batch processes
  - Need to analyze batches
  - Need a system of record for batch release
  - Need to manage batch and continuous information
  - Want to use one consistent system

# Example: Batch System of Record

- Solution:
  - PI System for storing real-time data
  - PI Batch for storing the batch events
  - PIBAGEN to read events and convert to batch structures
  - Event File Interface to read batch engine information
  - RtReports for validated reports
  - Process Templates for analysis

# Example: Batch System of Record



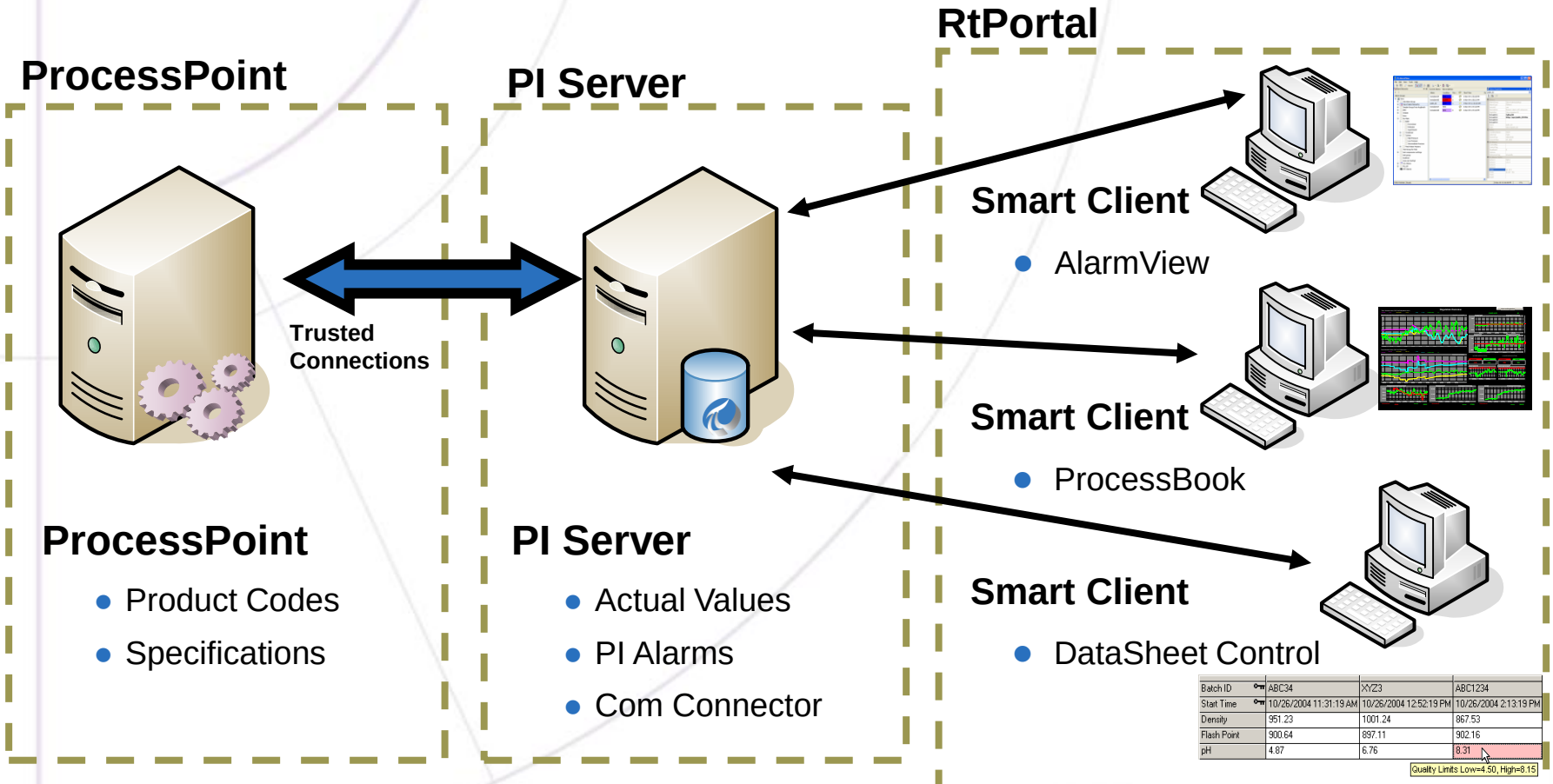
# Example:  Specification vs. Actual

- Example:  Specification vs. Actual
- Problem:
  - Manufacturing in a continuous process
  - Manufacture many different products or grades
  - Need to compare targets vs. actual values
  - Need to generate alarms based upon deviations
  - Need to generate SQC alarms

# Example:  Specification vs. Actual

- Solution:
  - PI System to track actual values
  - ProcessPoint to house specification history
  - ProcessPoint Com-Connector to expose specs as tags
  - PI Alarms to determine deviations
  - Alarm View to illustrate specs vs. actual values
  - PI Datasheet Control to allow entry of values

# Example: Specification vs. Actual



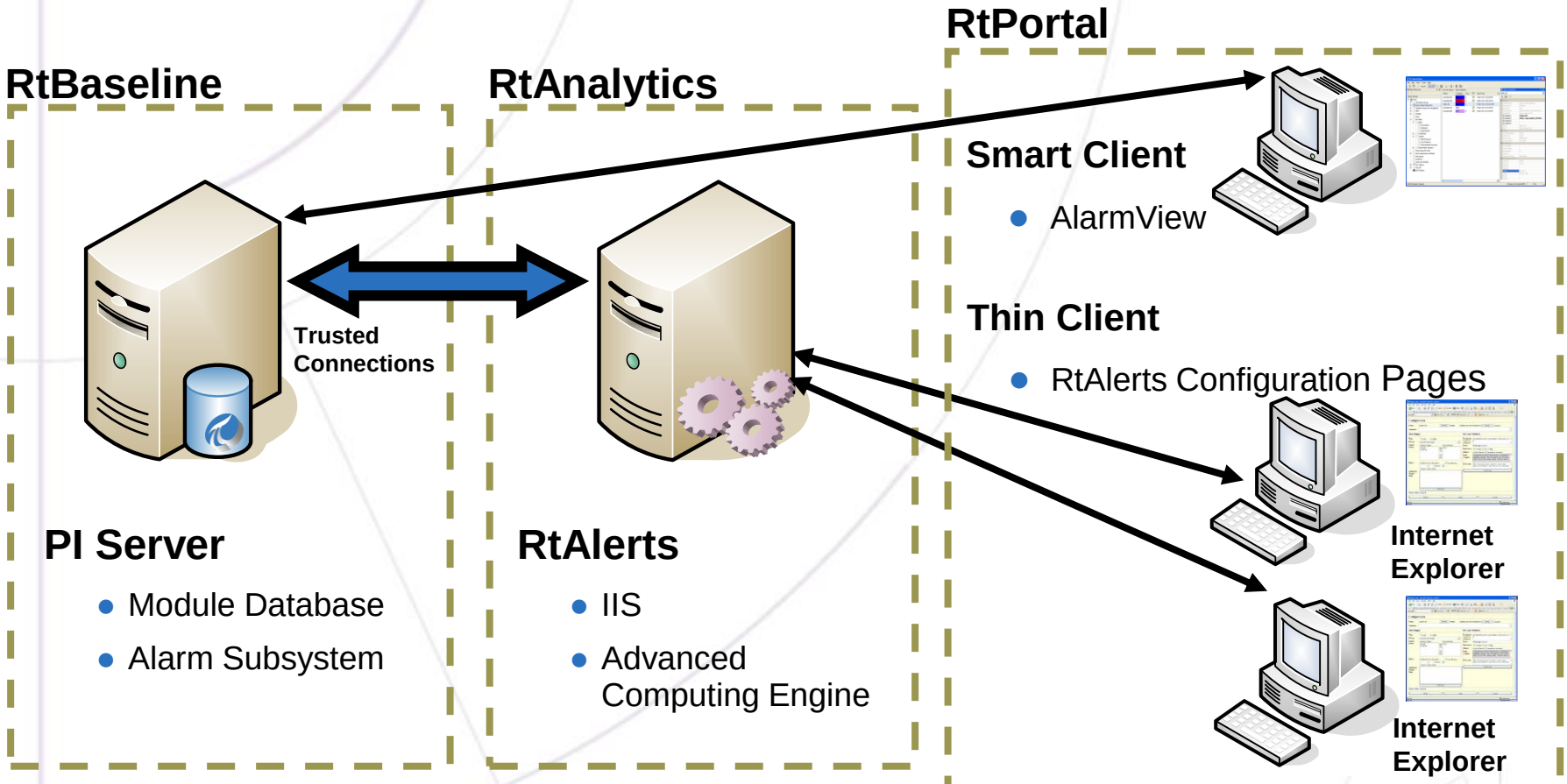
# Example:  Notification

- Problem:
  - In an enterprise there are…
    - Hundreds of processes
    - Thousands of systems
    - Millions of data values that continuously change
  - Need to way to detect when “something is wrong”
  - Need to provide this information in a way that promotes a top level view with drill-in
  - Need to dynamically notify users, supervisors when problems are “significant”

# Example:  Notification

- Solution:
  - PI Server collecting information
  - PI Alarm subsystem to generate alarms
    - Allows definition and detection of “something is wrong”
  - AlarmView for organizing and drill-in of alarms
  - RtAlerts for defining and generating e-mails

# Example: Notification



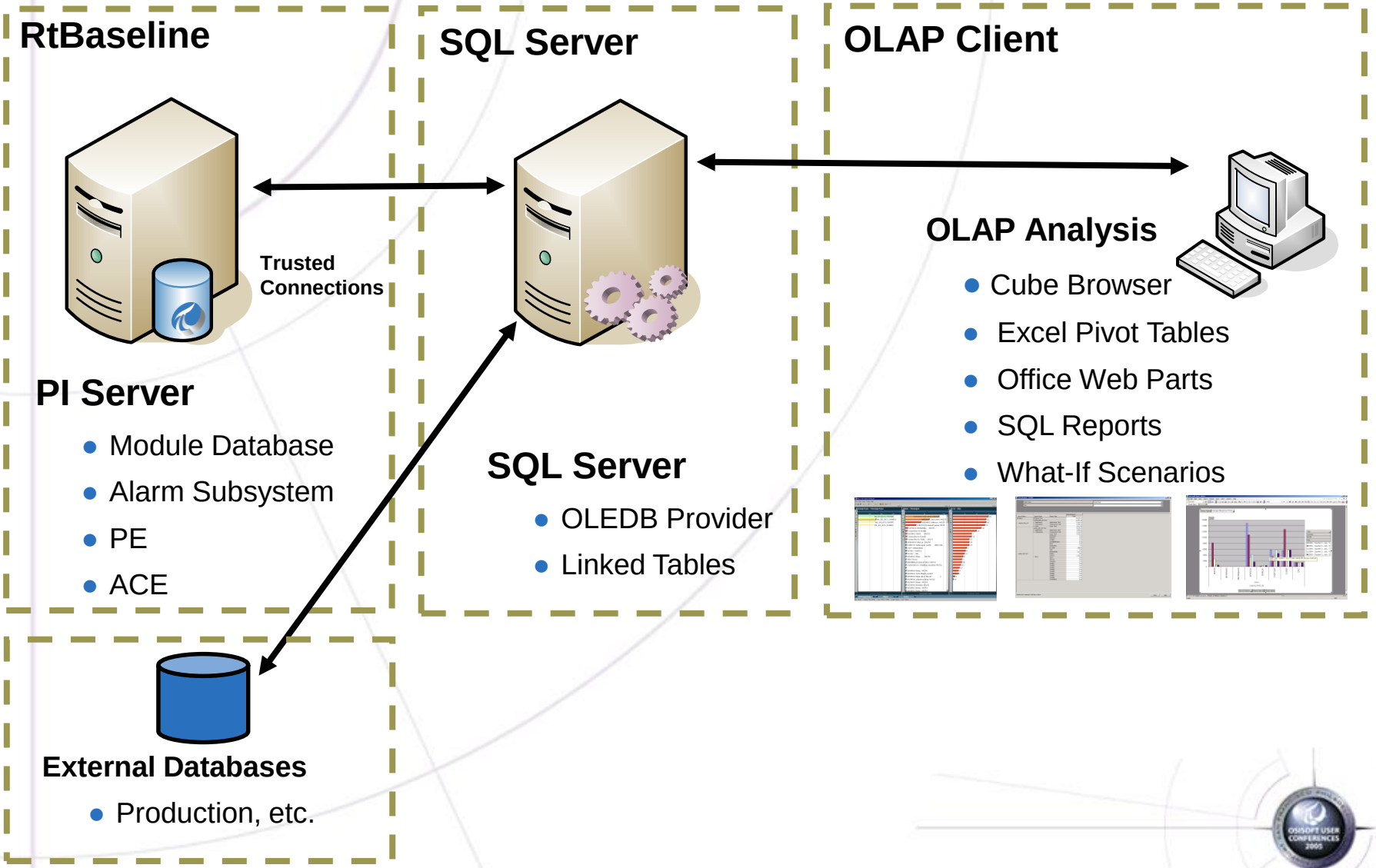
# Example:  Operating Conditions Rollup

- Problem:
  - Need a way to measure operating performance against expectations
  - Need to summarize this based upon equipment hierarchy
  - Need to analyze the problems to determine root-cause
  - Need a way to mine this data for questions like:
    - "Are there more work orders issued when I run a different grade raw material?"
    - "What does it cost me in terms of maintenance to meet rush orders?"
    - "Why do I have to service a piece of equipment after we use a shipment of raw materials from one supplier vs. another?"

# Example:  Operating Conditions Rollup

- Solution:
  - PI system to collect data
  - Alarm subsystem to generate alarms
  - One mechanism to rollup alarms
    - ACE  (sophisticated)
    - PE (simple)
  - PIOLEDB provider to read the information
  - SQL Server Analysis Services to analyze data

# Example: Operating Conditions Rollup



# So…What You Learned Today

- You have choice…which is good!
  - Configurable touch points
  - Programmatic touch points
- You can add incremental value to your enterprise assets today through, for instance,
  - Enterprise Data-Mart
  - Batch Analysis
  - Specification vs. Actual
  - Dynamic Alerting
  - Operating Rollup
- General guidelines exist to help you understand and choose the appropriate OSIsoft products to solve your business problems

# Resources:

- RtApps document:
  - http://osisoft.com/rtapps.aspx
- “Tips from the trenches” by Bryan Owen
  - http://www.osisoft.com/presentations.aspx?id=733&event=uc2004
- Previous conference talks:
  - http://www.osisoft.com/Presentations.aspx
- Partners