PI Developer Technologies Roadmap

Presented by:

Frank Garriel, David Hearn, & Bodo Bachmann

PI Developer Technologies

PI OPC Servers

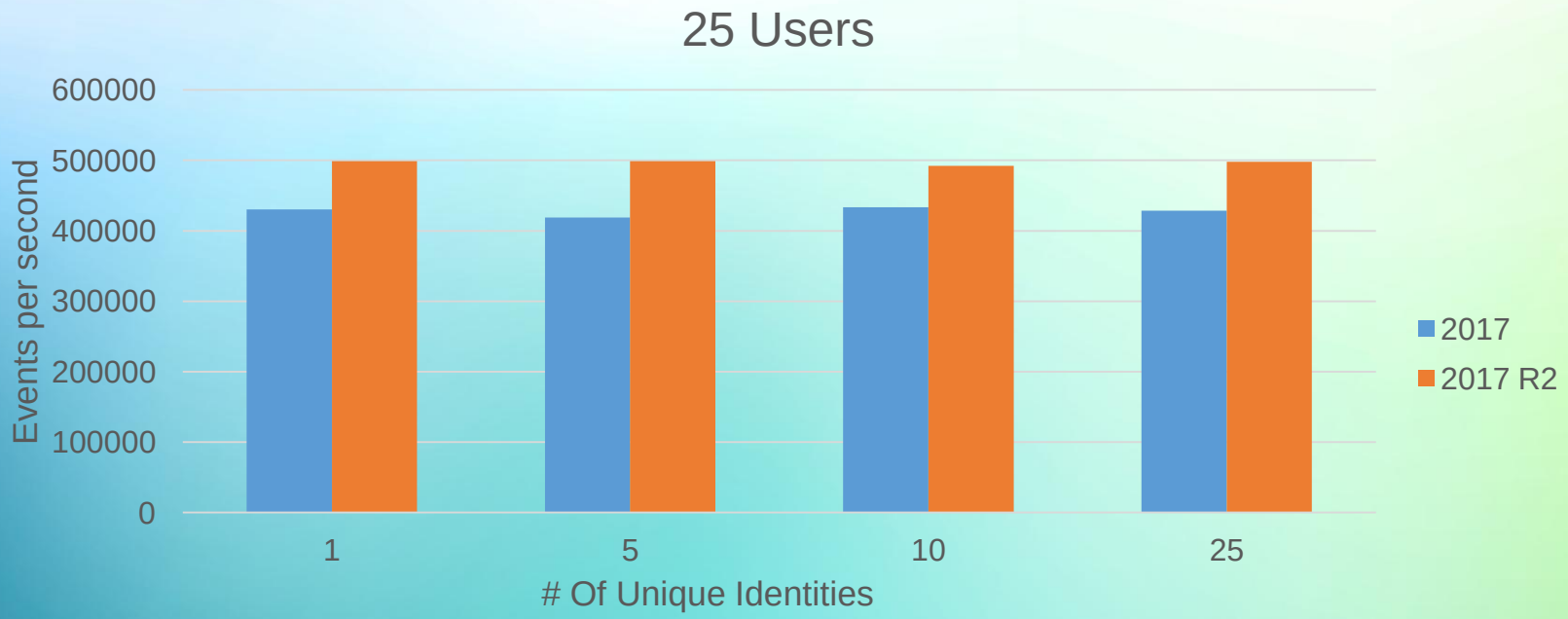
PI Web API

Presented by: Frank Garriel

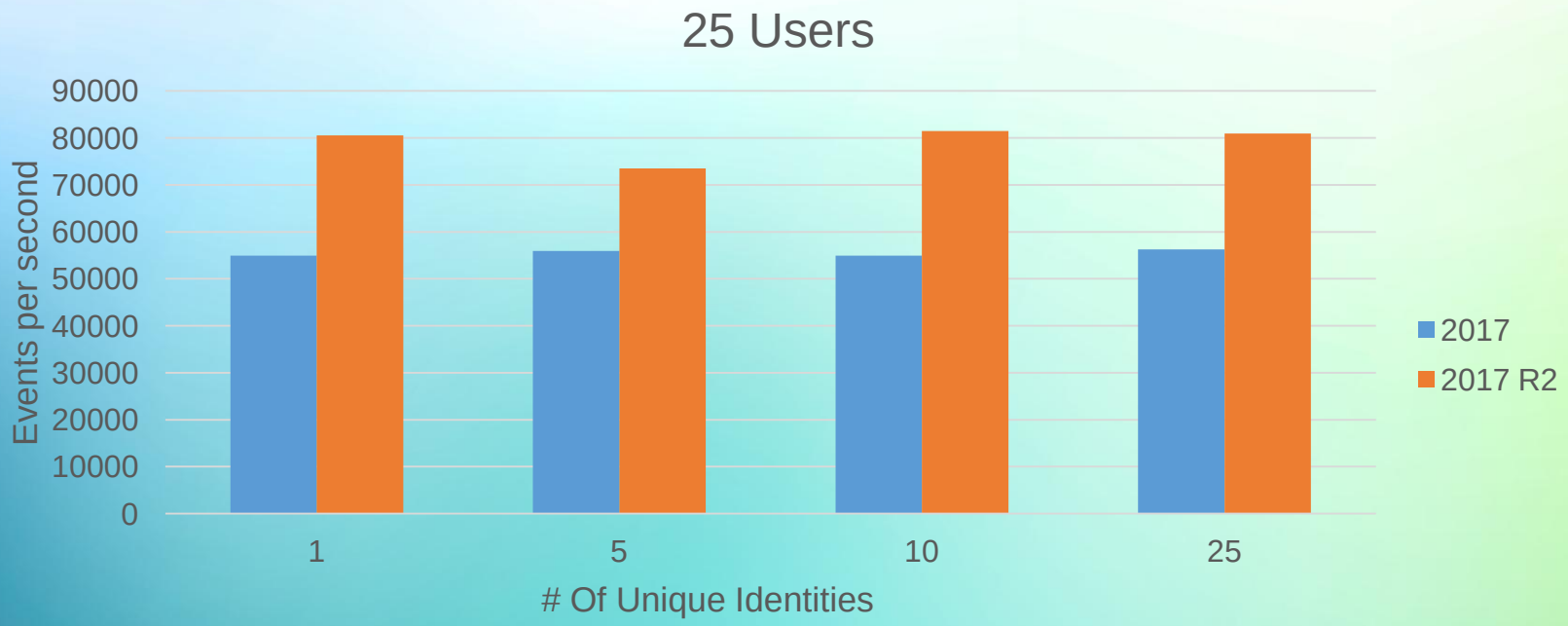
Performance & Scalability

- **PI Web API 2017 R2**
  - Channels Heartbeat
  - Raw Throughput Improvement
  - Web ID 2.0
- **PI Web API 2018**
  - Stream Updates CTP
- **PI Web API (Next Release)**
  - Streamsets Performance

Raw Data Read Throughput



Raw Data Write Throughput



Your Thoughts on Web ID

“always need to do 2 queries to get the actual information you want”

“2 requests are required instead of 1”

“Easier ways of retrieving streaming data **by AF hierarchy or PI Tag** name instead of using a generated webid for everything”

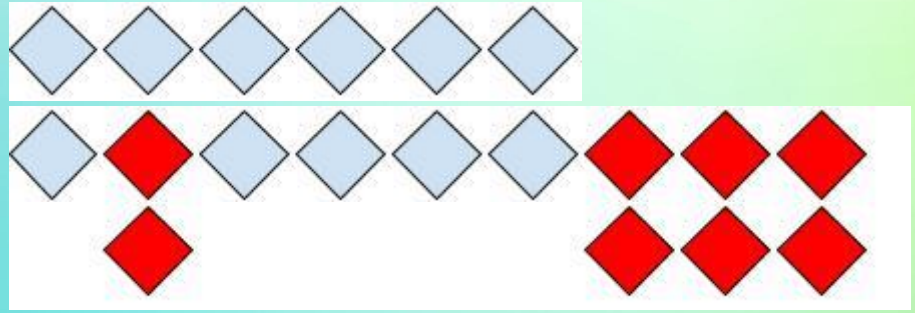
Web ID 2.0

- Faster
  - Eliminate the first call – Generate directly in your applications!
- Flexible – Compose WebIDs with only Path information
- Shorter – Smaller payloads & More IDs in a single request

How to Use Web ID 2.0

Stream Updates CTP

- **PI Web API 2018**
  - An HTTP alternative to WebSockets / Channels
  - Eliminate large responses
  - Get only the data you need



Stream Updates Roadmap

- **PI Web API 2018**
  - Stream Updates CTP
- **PI Web API (Next Release)**
  - Stream Updates CTP
    - Error handling
    - Changed Info
    - Bug Fixes

Features & Enhancements

PI Web API 2017 R2

- Search Elements & Attributes with AF Query Strings
- Swagger Spec
- Batch in read-only mode
- Mixed Mode Authentication
- Recorded Values at Times

PI Web API 2018

- Stream Updates CTP
- Event Frame & PI Point Annotations
- Get Table with Parameters
- Partial support for Notifications
- Filter Child Attributes by AttributeTrait

PI Web API (Next Release)

- Stream Updates CTP
- More Notifications Support
- Streamsets Performance Improvements
- Bug Fixes & Stable feature set

Also of interest to PI Web API developers

Presentations

11:30, This Room -

LiveCoding: Writing Highly Performant PI Web API Applications

Hands-On Labs

Right now, Dev Lab 3 -

Getting Started with PI WebAPI with Postman

Frank Garriel
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AF SDK

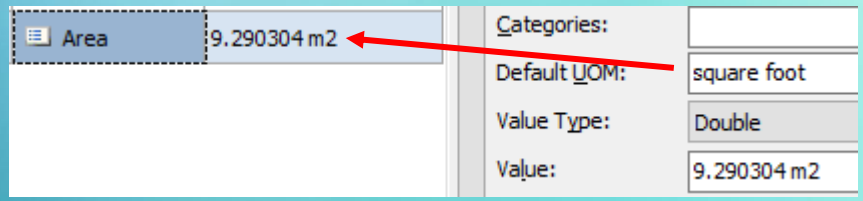
Presented by: David Hearn

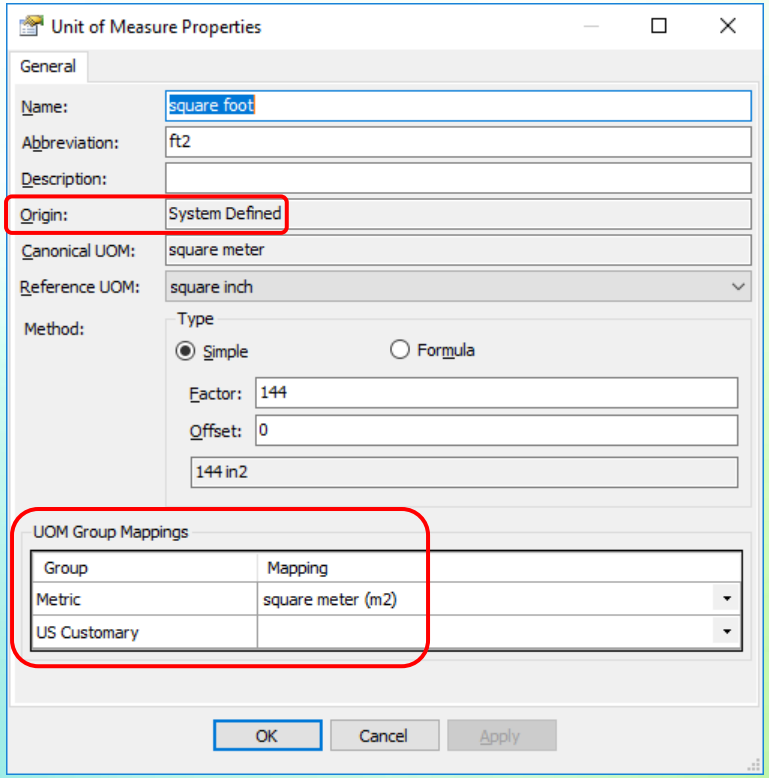
AF SDK: What's new? What's coming?

- User-centric display of data
- Easier to manage
- Search enhancements
- Performance improvements

Displaying Data

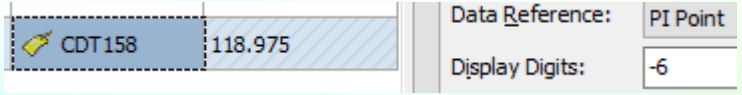
- Identify UOM origin (2017 R2)
- UOM Groups (2017 R2)
  - Define groups of UOMs (Metric, US Customary)
  - Calls to convert data to appropriate group



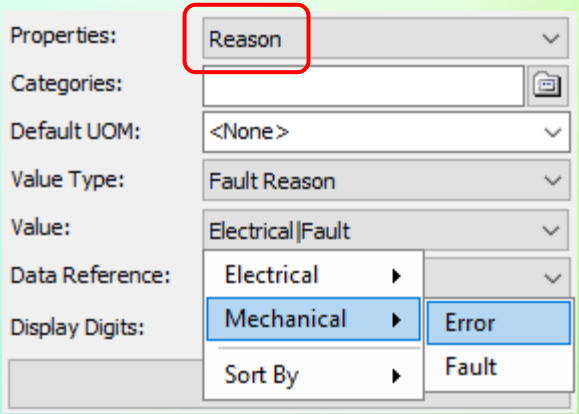


Displaying Data

- Display Digits (2018)
  - Shows appropriate precision
  - Follows PI standard: -20 to -1 to specify sig figs, 0 to 10 for fixed point

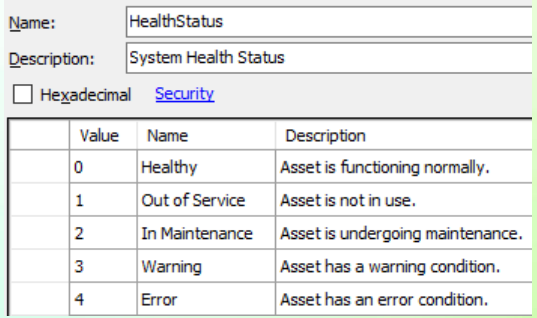


- Reason trait (2017 R2)
  - Built-in way to identify reason code
  - Always an enumeration value
- Hierarchical Enumeration Values (2017 R2)



Manageability (2018)

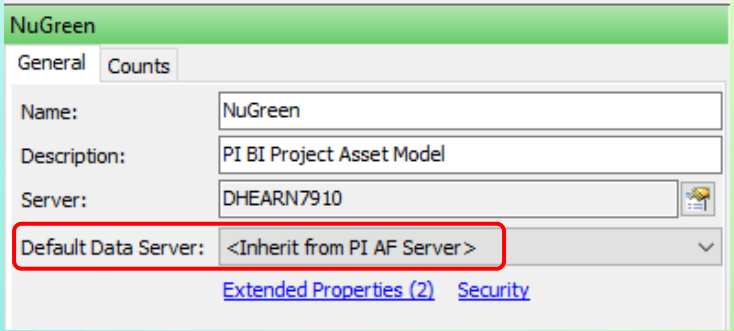
- Retain Object IDs on import
  - More seamless migration between PI Systems
- Health traits
  - Built-in enumeration status
  - Understood natively by PI Vision and other clients
- Connection balancing and failback to PI Data Archive
- View client connections to AF Server



	Value	Name	Description
	0	Healthy	Asset is functioning normally.
	1	Out of Service	Asset is not in use.
	2	In Maintenance	Asset is undergoing maintenance.
	3	Warning	Asset has a warning condition.
	4	Error	Asset has an error condition.

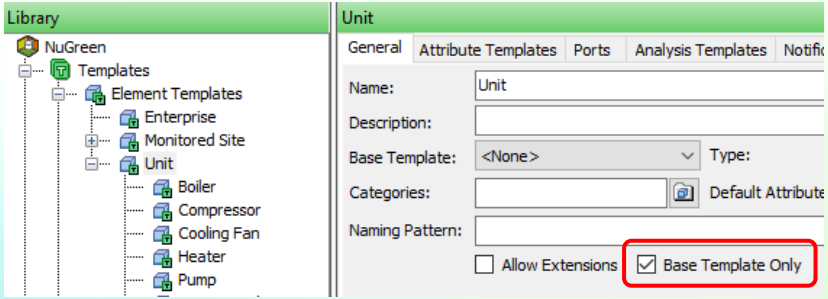
Manageability (Coming Soon)

- Administration Functions
  - Previously only available using AFDiag utility
  - Now available via AF SDK or PowerShell
- Query Analysis Service Runtime Information
- Specify default PI Data Archive
  - Used when resolving %SERVER% in configuration strings

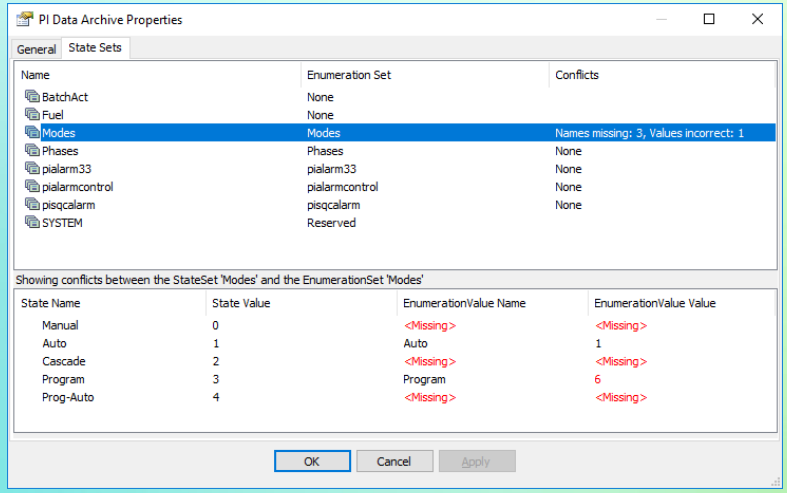


Manageability (Coming Soon)

- Base Template Only
  - Can only be used as base template



- PI State Sets to AF Enumeration Sets
  - Create Enumeration Sets
  - View conflicts



Search Enhancements

- Search Attributes, Contact Templates (2017 R2)
- New filters
  - Parent, EventFrame, PlugIn, IsInternal (2017 R2)
  - OwnerName (Coming Soon)

- Nested criteria (2017 R2)
  - Allows the result of one search to supply the filter for another
  - Filters supported: Element, EventFrame, Parent

Examples:

Elements of Template A whose parent is Template B
Event Frames over the last 7 days where primary element has Category A

Search Enhancements

- New fields
  - Contact, IsInternal (2017 R2)
  - Security, ConfigString, PlugIn, DisplayDigits, IsManualDataEntry, Trait, UOM (2018)
  - OwnerName (Coming Soon)

- Find by ID for all search types, use with IN operator (2018)

Examples:

Open Event Frames with primary element in {ID1, ID2, ID3, ID4}
Retrieve Start Time, End Time, Reason Attribute for Event Frames in {ID1,…,ID50}

Search Enhancements

- Attribute Values without Template (2018)
  - Find elements by attribute value not defined by template
  - Same attribute name from multiple templates

- Support for OR conditions (Coming Soon)

Examples:

Elements with Category#1, Category#2, or Category#3

Event Frames whose primary element is from Template#1 or Template#2

Performance Improvements

- Concurrent calls per-connection (2017 R2)
  - By default, up to 10 concurrent calls per AF Server connection
- Bulk annotation retrieval from PI Data Archive (2017 R2)
- Bulk check-out, delete (2018)
  - Takes list of IDs (can be retrieved from search without loading objects)

Performance Improvements

- Templated attributes not configured (2018)
  - Opt-in to missing PI Point caching
  - Avoids RPC to resolve name on every call
- Event Frame search performance (Coming Soon)
  - Improved overlapped query search performance
  - Improves PI Vision trend displays
- General improvements to PI data access

What Else is Coming?

- Event Frame search subscriptions
- Multi-user performance improvements
- PI System Directory exposure
- .NET Standard version of AF SDK
  - Supports Windows platforms
  - Deployment planned via NuGet
- Future support for .NET 3.5 version of AF SDK
  - No new features after next release
  - Available as separate AFClient .NET 3.5 install

Also of interest for AF SDK developers

- **Live Coding: Getting the most out of AFSearch**
  (11:30, Room 117, P1 Level)
- **Advances in PI System Streaming Analytics with MATLAB and Other External Calculation Engines**
  (12:20, Room 114, P1 Level)
- **How To: Streaming Calculations with the PI System and MATLAB and Other External Calculation Engines**
  (15:30, Room 114, P1 Level)

David Hearn
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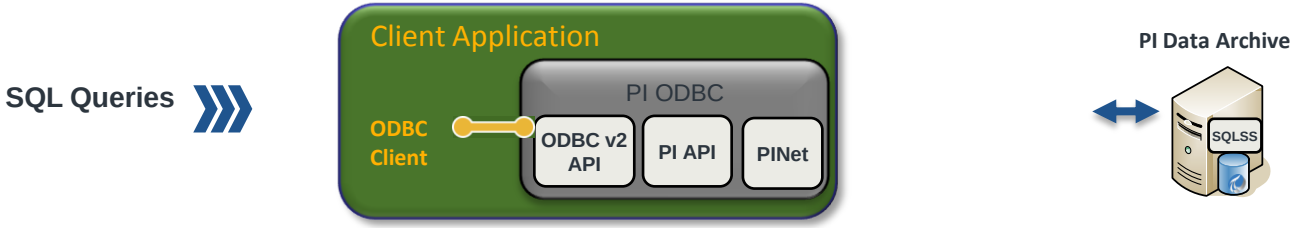
PI SQL Family

Presented by: Bodo Bachmann

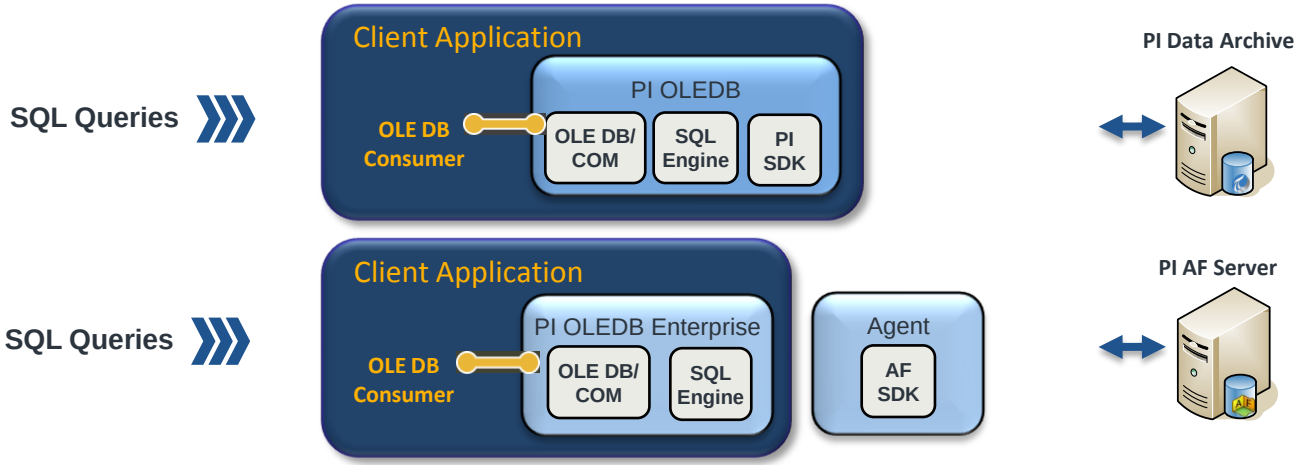
PI SQL Family Evolution

PI ODBC



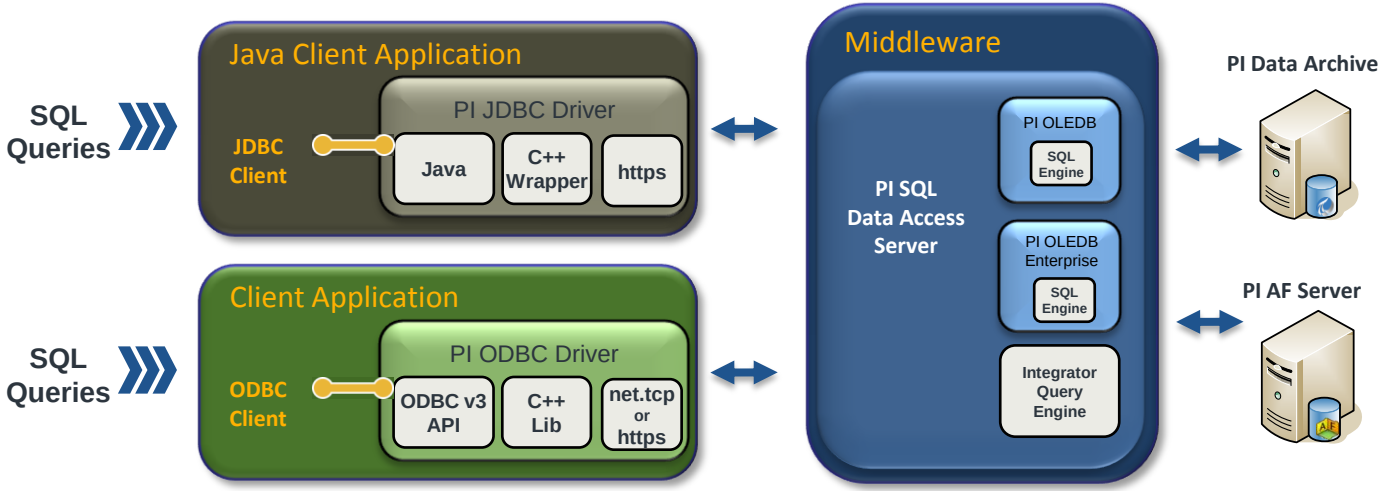
2nd Generation

PI OLEDB Provider **PI OLEDB Enterprise**



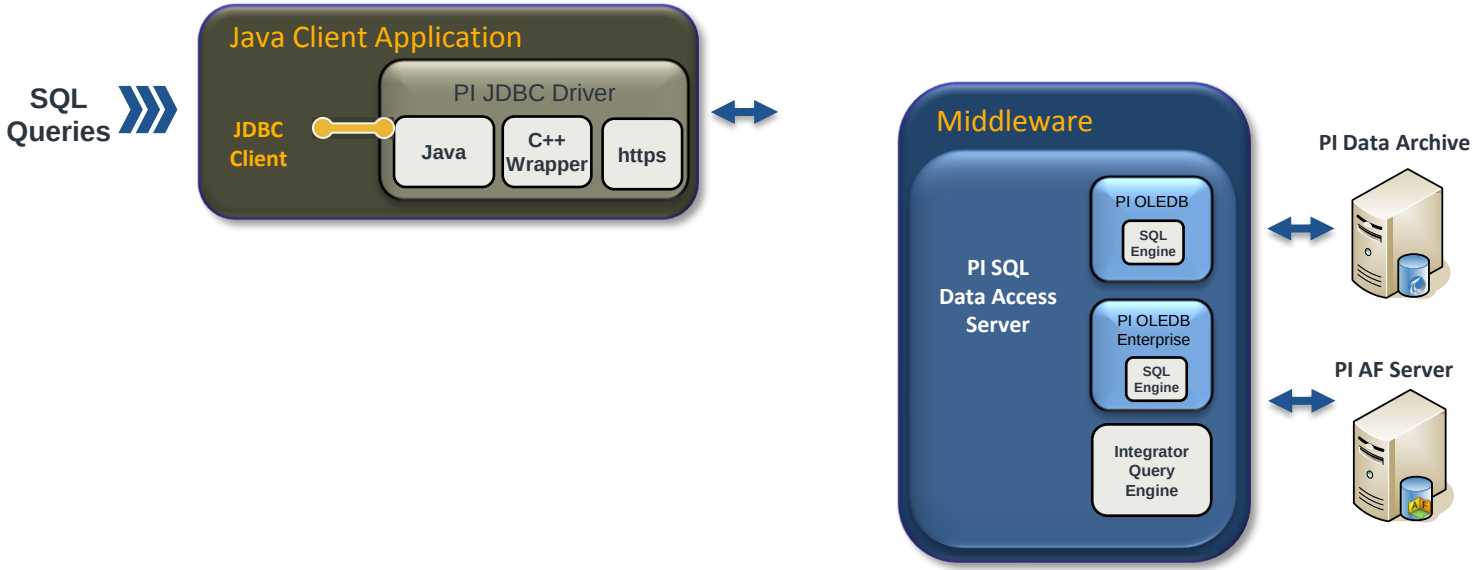
3rd Generation

PI JDBC Driver **PI ODBC Driver**



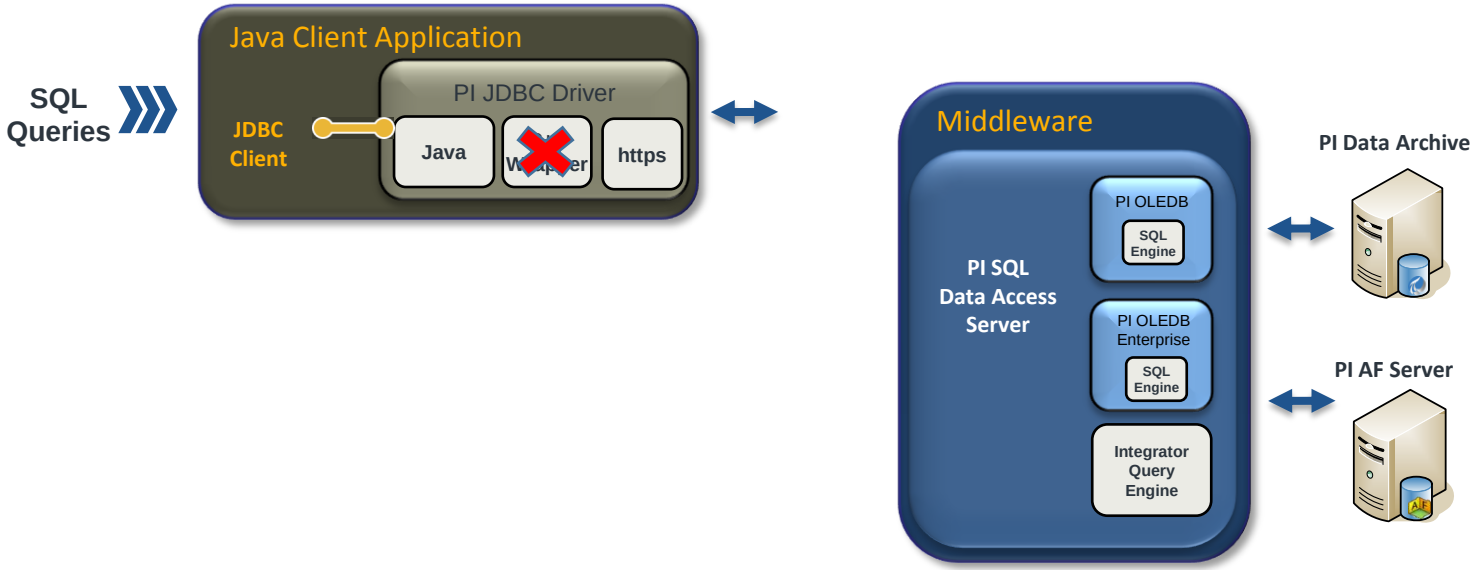
PI JDBC Driver 2017 R2

PI JDBC Driver



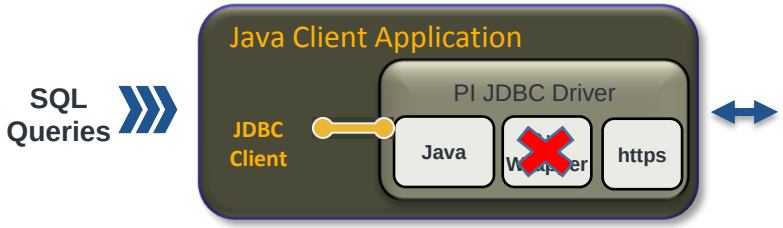
PI JDBC Driver 2018

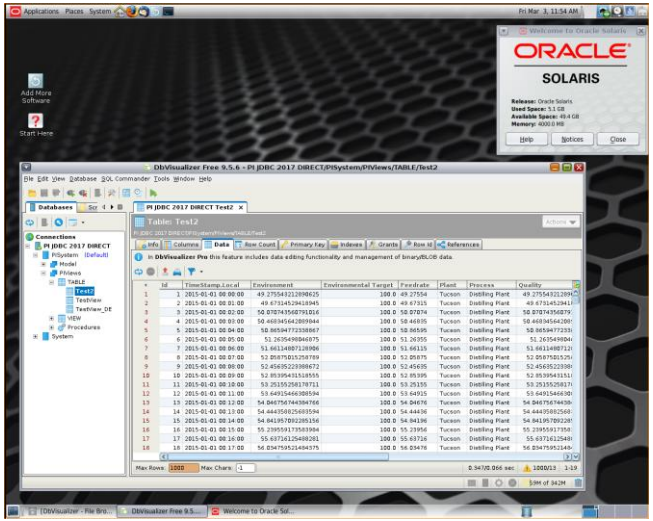
PI JDBC Driver

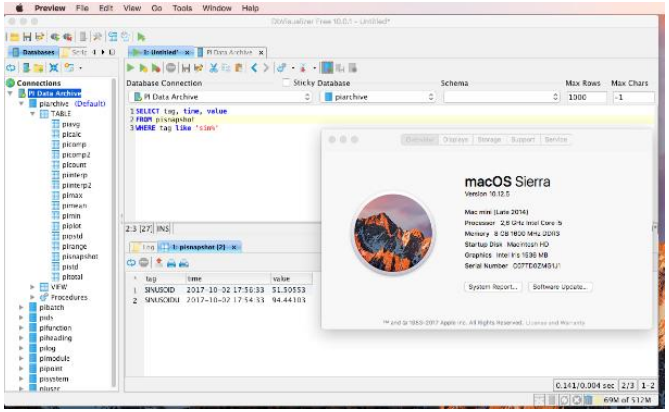


PI JDBC Driver 2018

PI JDBC Driver

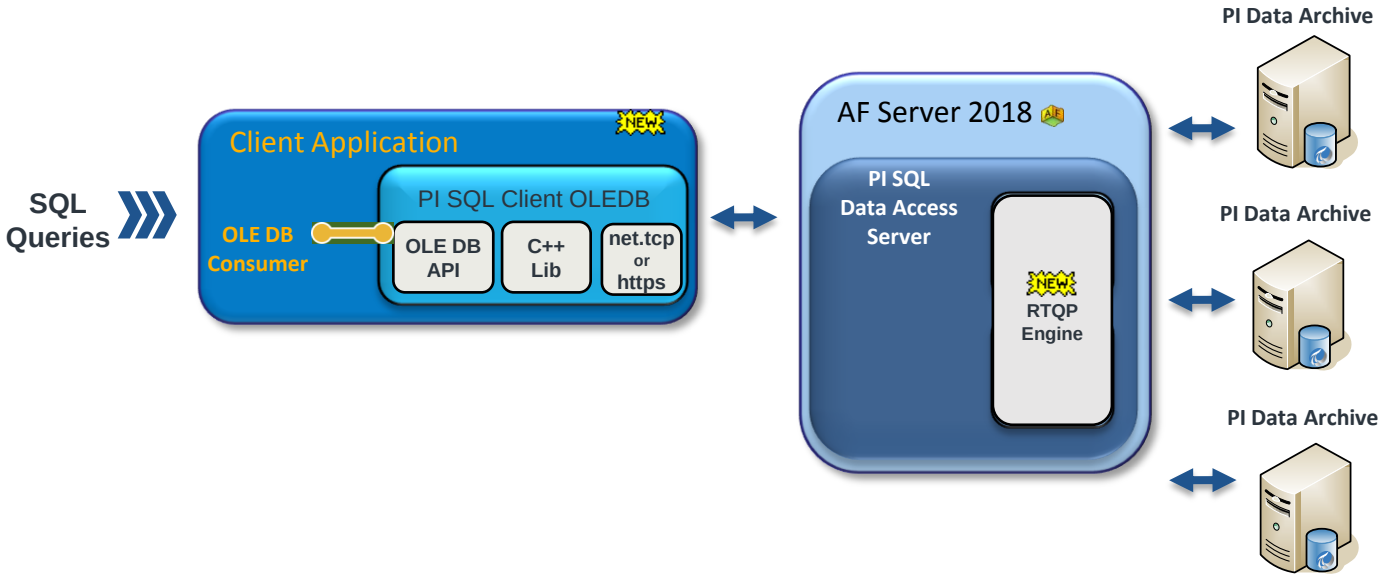






Next Generation

PI SQL Client

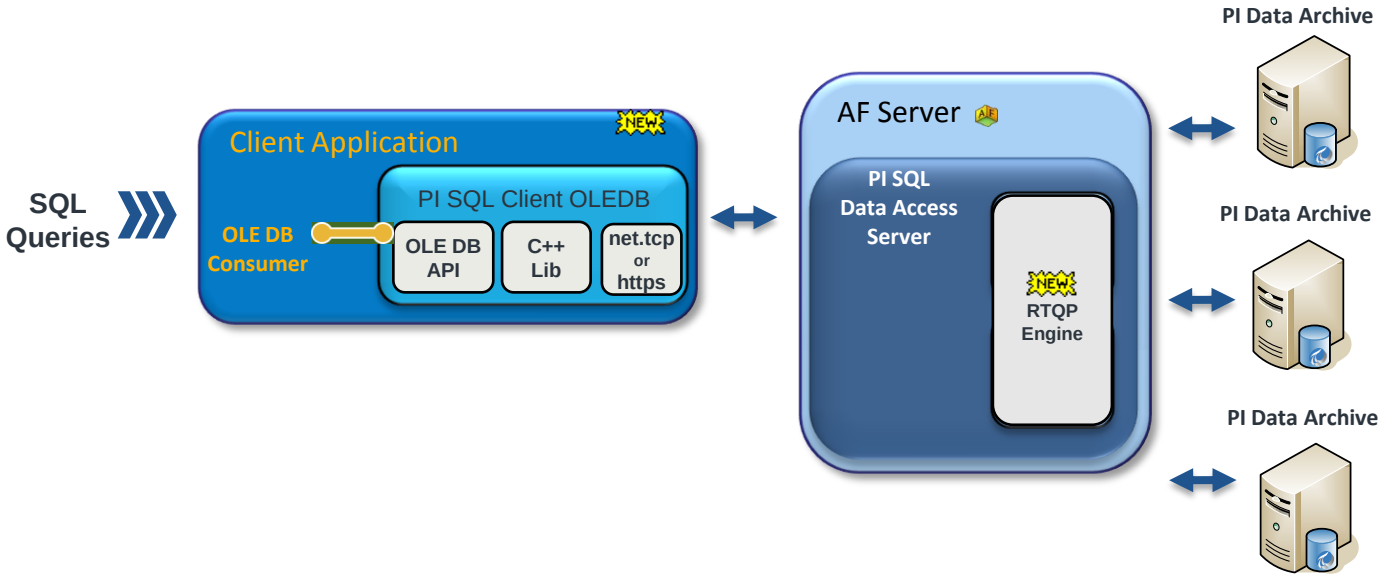


Next Generation Development Goals

- Performance and scalability
- Review data model
  - Reduce query complexity
  - What are top use cases (use customer feedback)
  - Address known issues (e.g. timestep data type, PI time literals)
- Infrastructure to support multiple standards and thin clients
- Works across WAN and different time zones
- Review security and authentication

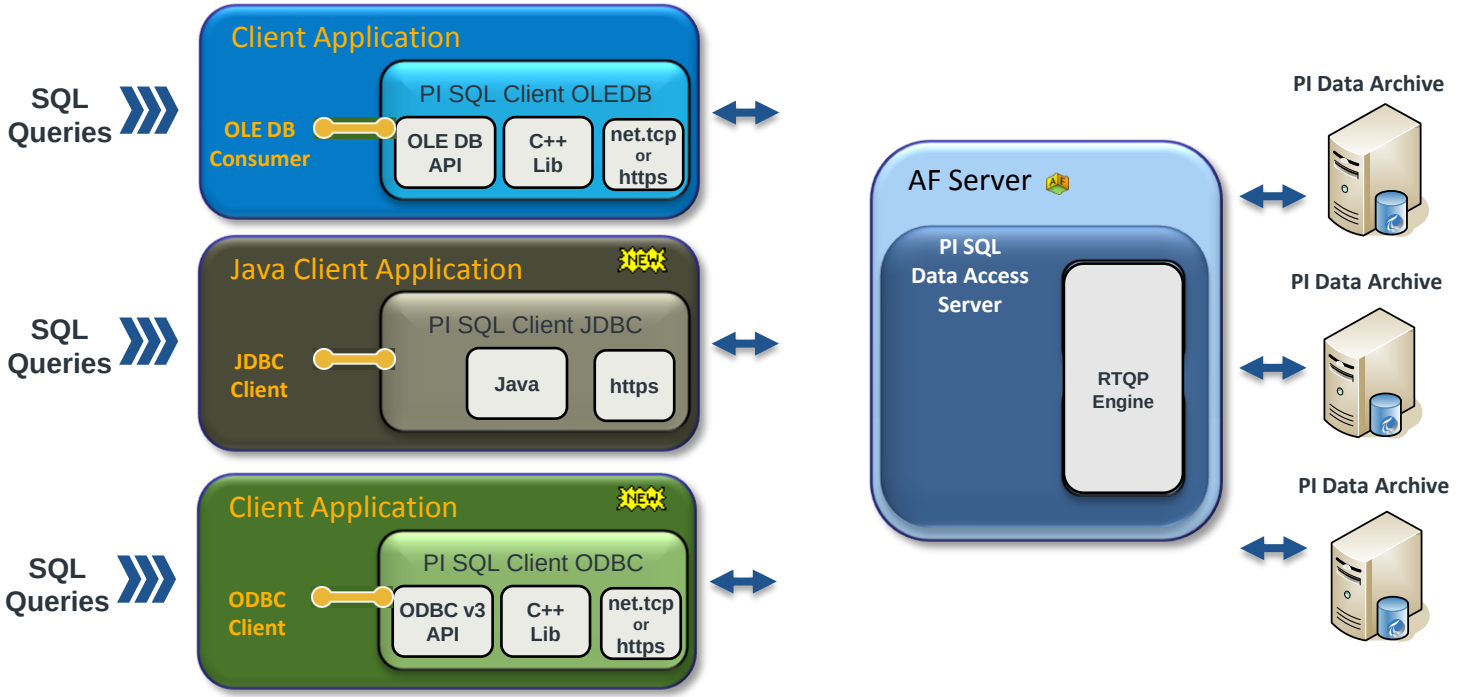
PI SQL Client 2018

PI SQL Client



PI SQL Client 2018 R2 – In Development

PI SQL Client



Hands-On Labs

Labs

- Develop an IoT Java application: Use the PI JDBC Driver on a Rasperry Pi to connect Sensors and Actuators with the PI System
  - Today, 10:40 – 13:00

- Build High Performance Queries Using our New Real-Time Query Processing Engine
  - Today, 14:30 – 16:15

PI SQL Family

Bodo Bachmann

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Engineering Manager Europe

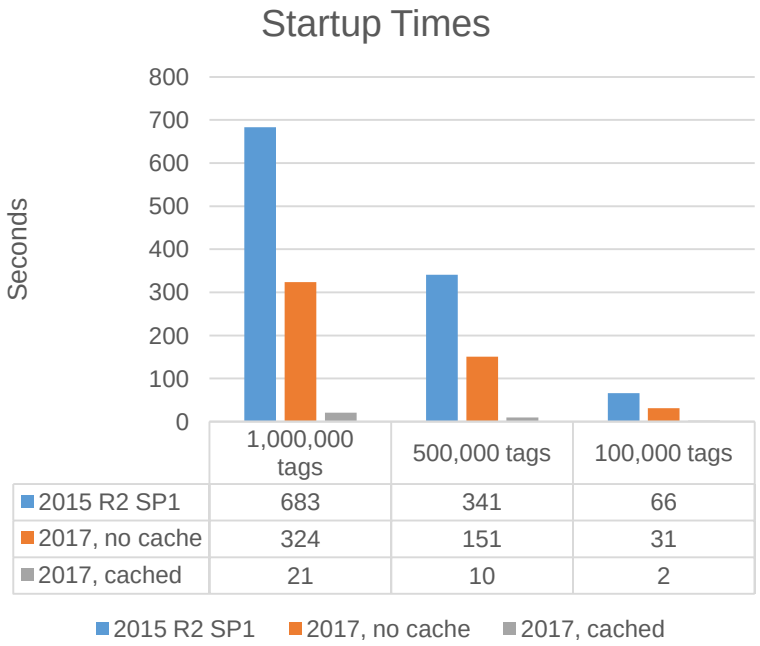
OSIsoft

PI OPC Servers

Presented by: Frank Garriel

PI OPC DA Server 2017

- 50% faster initial startup time than 2015
- Namespace Data cached on shutdown leads to...
  - 95% faster startups!



PI OPC DA Server 2018

- Handle PI point edits and deletes while not running
- OPC Quality Codes:
  - Improved representation of Questionable and Substituted flags
- PI Data Archive Whitelist and Blacklist
- Improved debug logging and tracing support
- Include AF Client in Setup

PI OPC HDA Server 2016

- OPC HDA v1.2 compliance issue:
  - PercentGood is now defined as time-weighted
- Two memory leaks fixed:
  - TimeAverage reads
  - Repeated connection / disconnection
  - Fixed some null pointers, empty strings, ItemHandle release bug
- End of support of Module Database

PI OPC HDA Server vNext

- Continued Maintenance:
  - Windows operating system checks
  - Confirm operation with PI SDK upgrades
  - Bug fixes as necessary…

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Questions?

Please wait for the **microphone**

State your **name & company**

Please rate this session in the mobile app!