



Product Roadmap

Presented by **Sander Kim**



Our Vision: Industrial Digital Transformation

Assets



**Multiple
Sensors**

Plant



**Multiple
Assets**

Enterprise

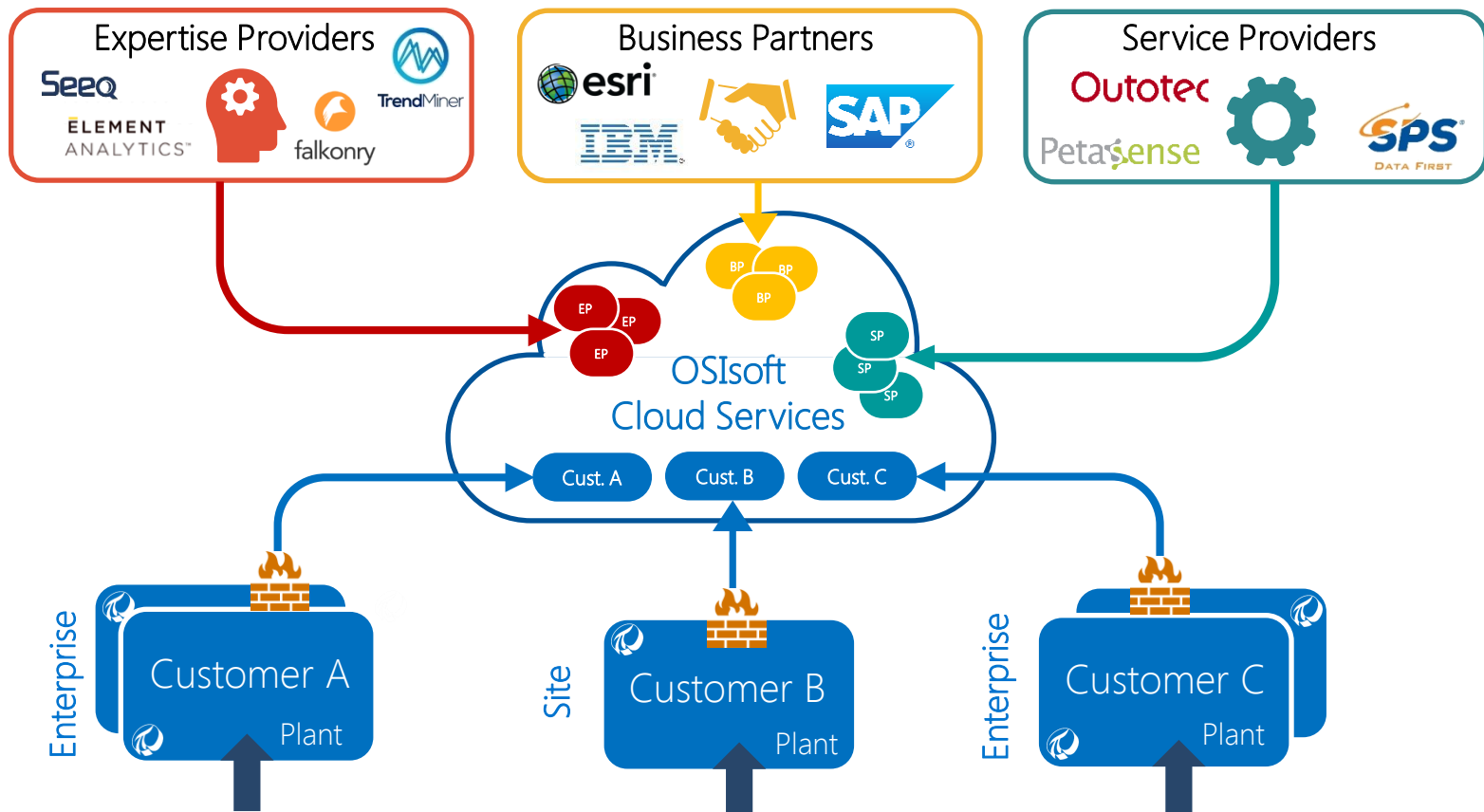


**Multiple
Plants**

Community



**Multiple
Enterprises**



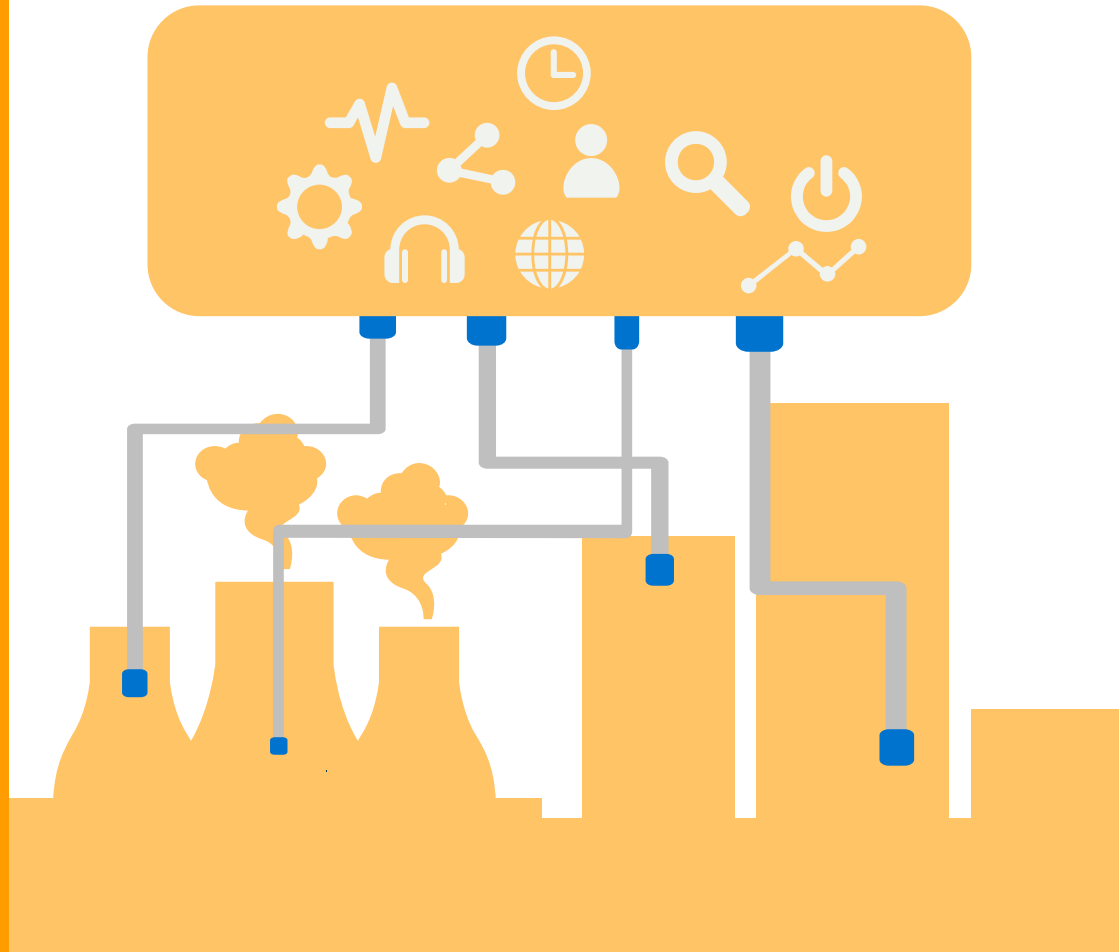
1

Accessing all Operational Data

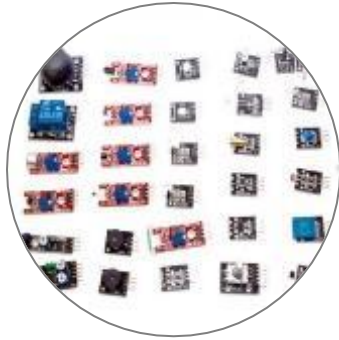


“It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the **most adaptable to change**”

- Charles Darwin (1809-1882)



What is changing in the industrial world?



Cheap, and tiny
sensors



Decreasing compute
and storage costs



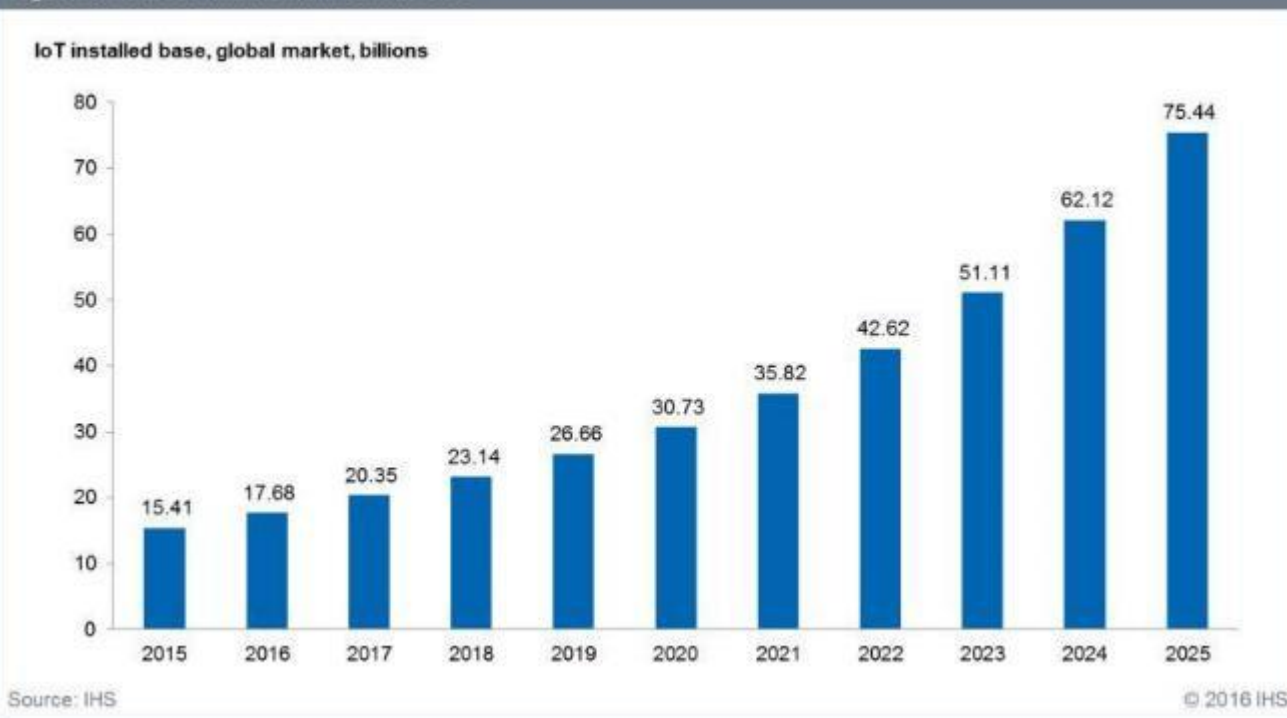
New abilities to
process and analyze
data



Ubiquitous
connectivity

The growth of connected devices is enormous

Figure 1. The IoT market will be massive

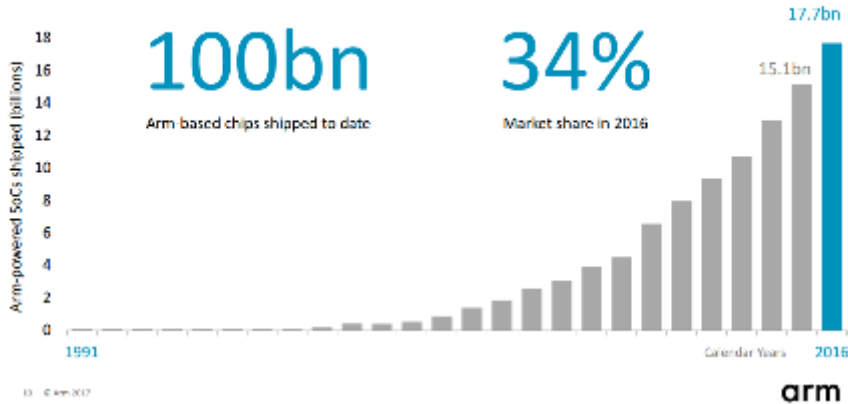


Explosion of lower cost sensors, new devices, gateways, and new patterns of connectivity

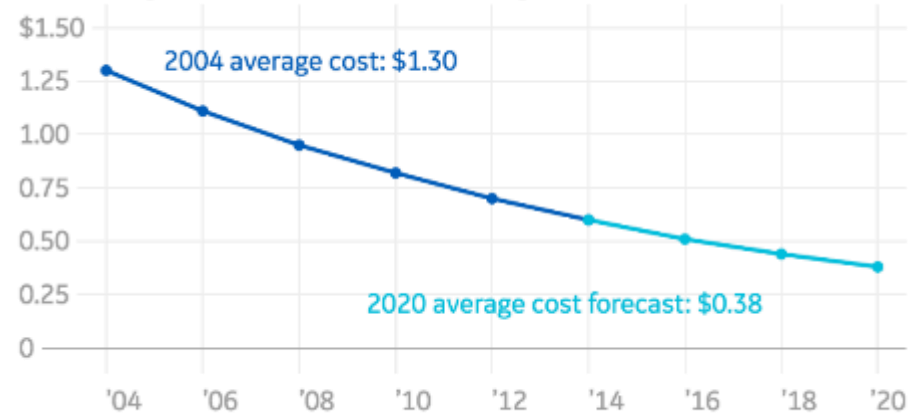
17.7B units ARM processors shipped in 2016

The cost of IoT sensors has dropped 71% over the last decade

Arm-based chip shipments



The average cost of IoT sensors is falling



ATLAS | Data: Goldman Sachs, BI Intelligence Estimates

OSIsoft Pervasive Data Collection

Ensuring no matter where your time-series, operational data resides, there are OSIsoft technologies available to collect and store this data

USE

CONNECTS TO

EDGE TECHNOLOGY

HARDWARE PLATFORM

Large facilities
10s of systems
1,000,000s of data streams
- 100,000s streams/system



DCS

PI
Connector



Server / PC

Distributed and/or remote assets
10,000s of devices
1,000,000s of data stream
- 100s of streams / device



Remote Assets

PI
Connector



Industrial Router

Embedded within equipment,
control and IT hardware
1,000s of devices
1,000,000s of data streams
- 1,000s of streams / device



Automation Equipment



Edge Data Store



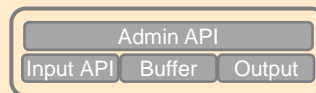
Edge
Gateway

PLC
Controller

Complied In, open source
technology from OSIssoft
100,000s of devices
1,000,000s of data streams
- 10s of streams / device



Sensors



Open Edge Module



Embedded
Gateway

SBC

Roll your own embedded app
10,000s of devices
1,000,000s of data streams
- 100s of streams / device



Proprietary Hardware

OMF
Application



Local
HMI

Industrial
Switch

Any OS

Pervasive Data Collection Roadmap, Estimated

Q4 '17

Q1 '18

Q2 '18

Q3 '18

Q4 '18

PI Connectors for Windows GA*
- Various
PI Connectors for Linux Beta
- Modbus TCP
OMF / PI Connector Relay v1.0 Beta
Open Edge Module Alpha
Edge Data Store Alpha

Open Edge Module Beta

PI Connectors for Linux GA
- Modbus TCP
PI Connectors for Linux Alpha/Beta
- Protocols, Hardware TBD
OMF / PI Connector Relay v1.0 GA
Open Edge Module GA
Edge Data Store Beta

PI Connectors for Linux GA
- Protocols, Hardware TBD
OMF / PI Connector Relay v2.0 Alpha
- Additional features
Open Edge Module v2.0 Alpha
Edge Data Store GA

* GA = General Availability



Evolution of the PI System

2

Extend the PI System: Data Quality, stale data

Extend



Ensure **data quality** information is visible and understandable where its used

Data Collection



Identify stale data and propagate staleness

Storage



Record periods of stale data

Asset Analytics



Calculations take into account quality of data

Developer Technologies



Indication of quality of data

Visualization



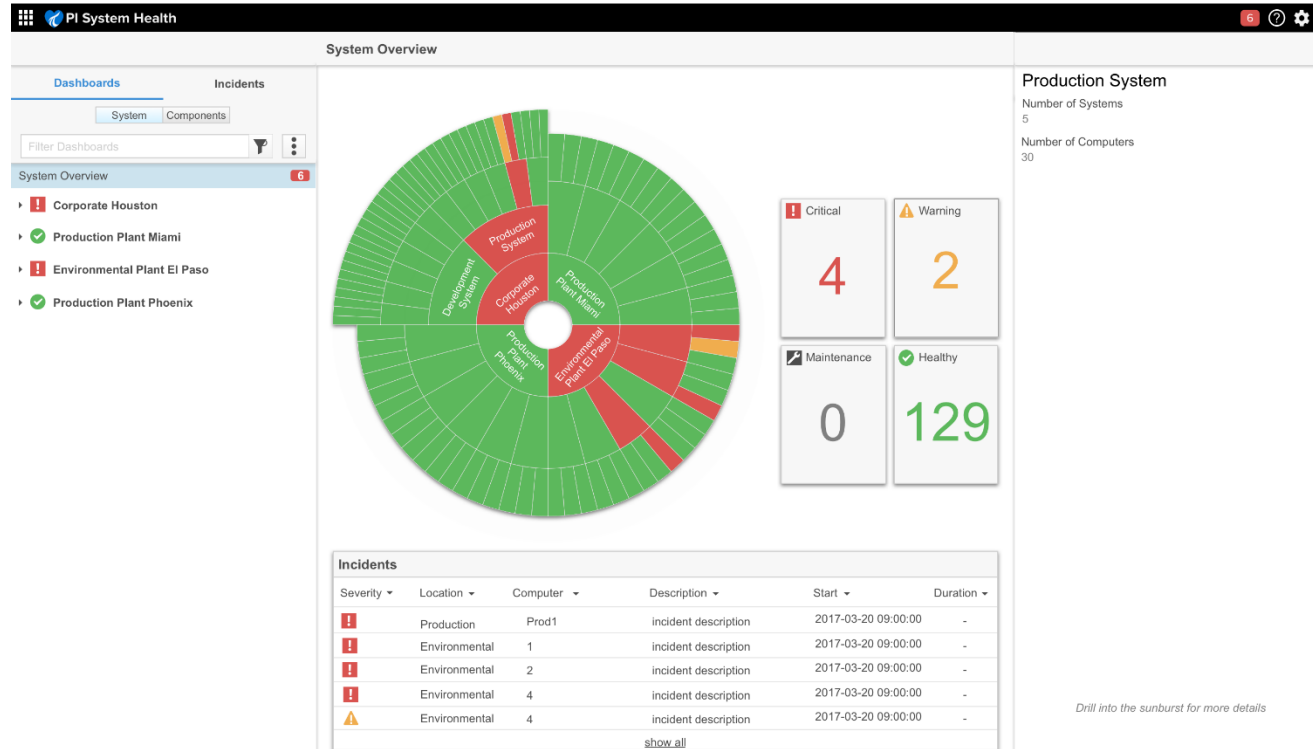
Display data with staleness information

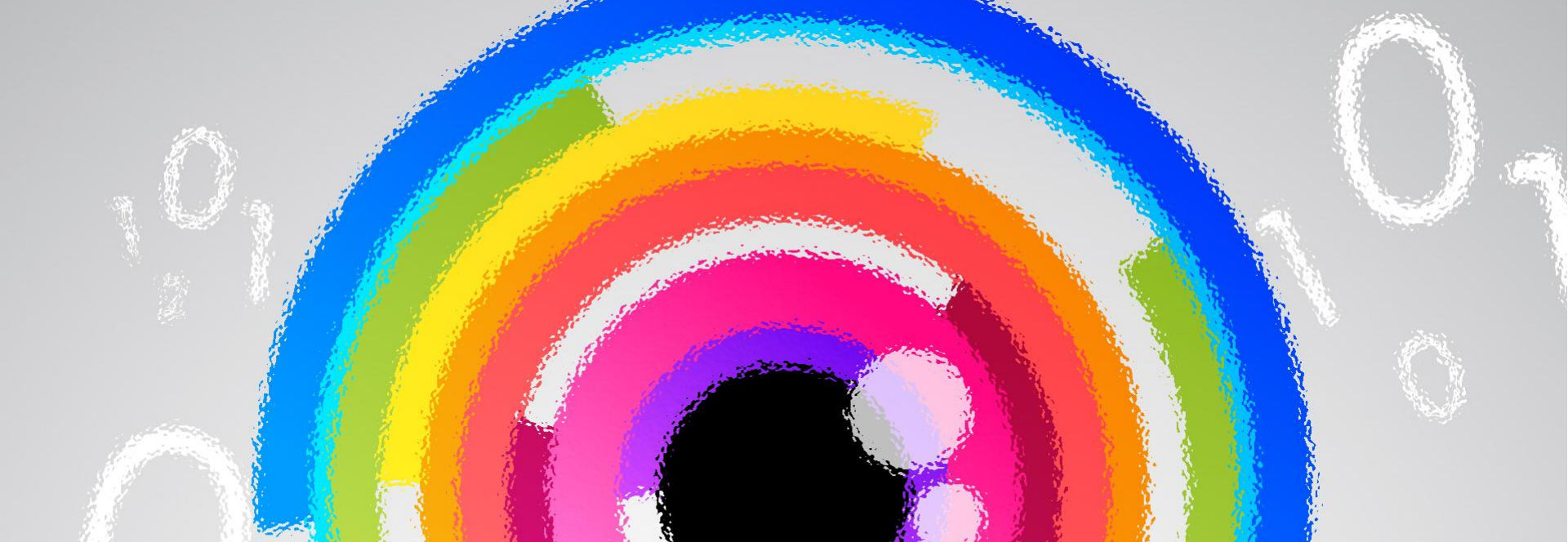
Ease of Use with the PI System: Management and Administration

Ease



PI system tools
designed to work
across the enterprise





3

Visualizing Operations Data

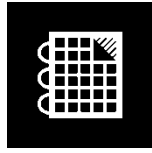
One Vision:

A unified visualization infrastructure to support your needs across the enterprise in a seamless, powerful, extensible environment.



PI Vision: A Critical Piece of the Infrastructure

Today



PI ProcessBook

Display Editor
Process Monitoring



PI Coresight

Ad Hoc Analysis
PB Display Viewer



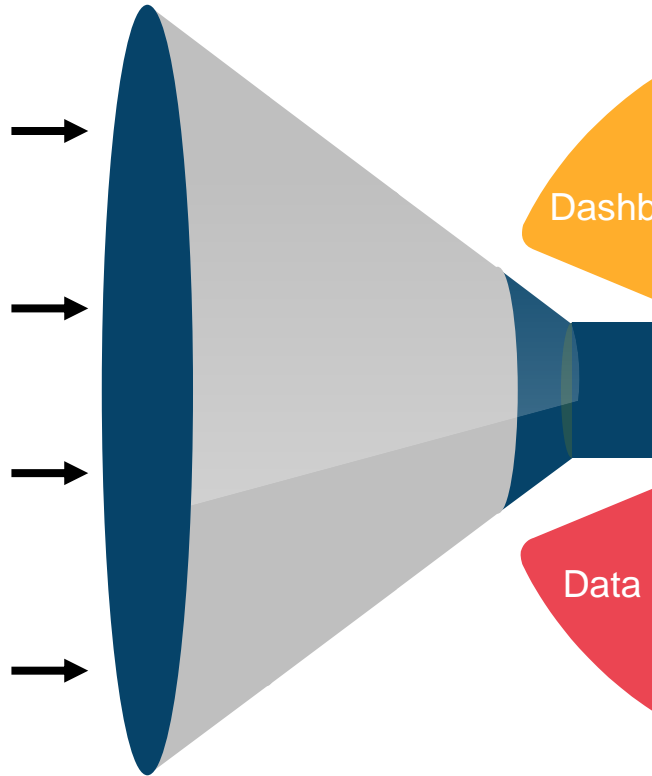
PI WebParts

Dashboards

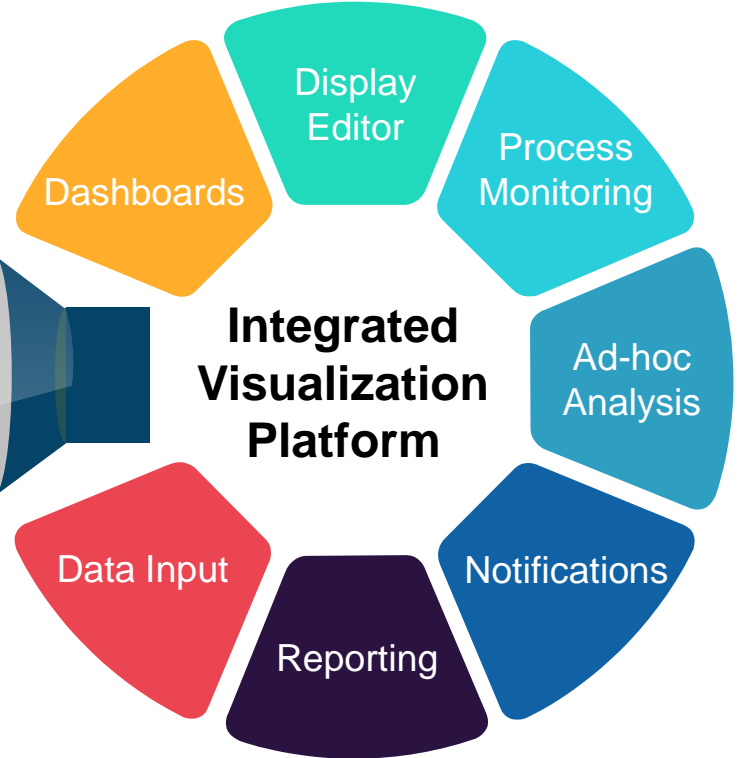


PI Manual Logger

Manual Data Entry



Tomorrow



PI Vision Journey

2016

Display Editing

- ✓ New Display Editor
- ✓ HTML5: Desktop or Mobile
- ✓ PB Viewer
- ✓ Event Comparison

2016 R2

Event Analysis

- ✓ Event Search
- ✓ Trend Configuration
- ✓ Event Comparison Displays
- ✓ Event Details and Acknowledgement

2017

Asset Dashboards

- ✓ Collections
- ✓ Drill-in Navigation
- ✓ Graphics Library
- ✓ Pinned Events
- ✓ Asset Comparison Table

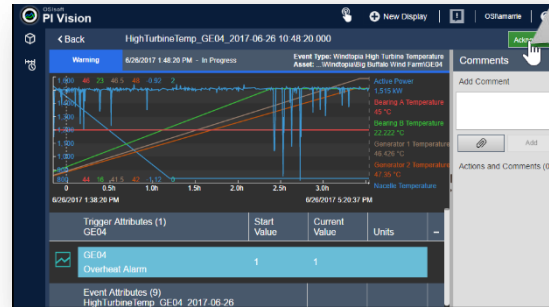
2017 R2

Display Organization

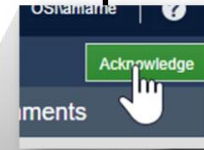
- ✓ Display Folders
- ✓ Related Assets
- ✓ XY Plot
- ✓ Events Table
- ✓ Sizing and Formatting



New Display Editor

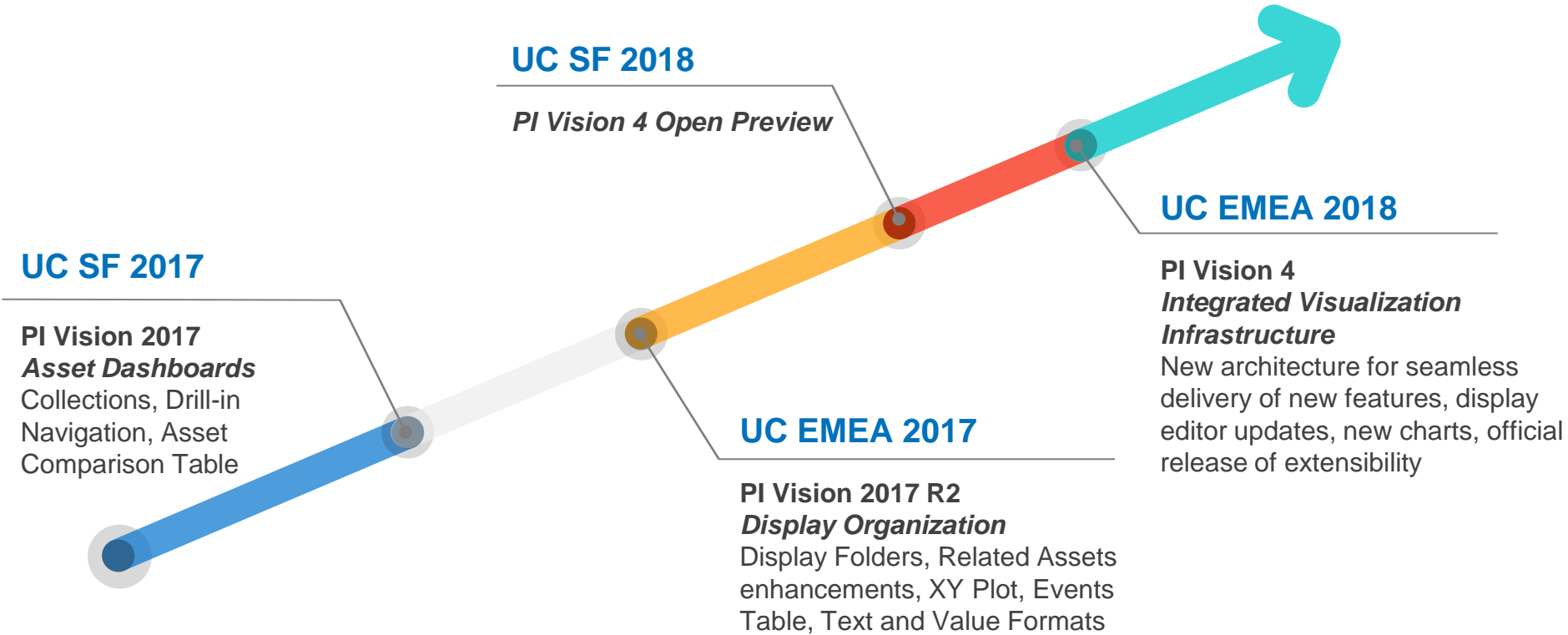


Events Details and Acknowledgement



Collections and Drill-in Navigation

PI Vision Roadmap




4


Data Integration




Questions customers want to answer



What is my overall production in each region over the last year? How does this change over time?



Did I produce within my compliance goals?
When did I not comply?
On which assets?



What assets are performing the best and worst? What factors are contributing to that performance? Which assets are most in need of maintenance?

Advanced Integrations – Supported Systems

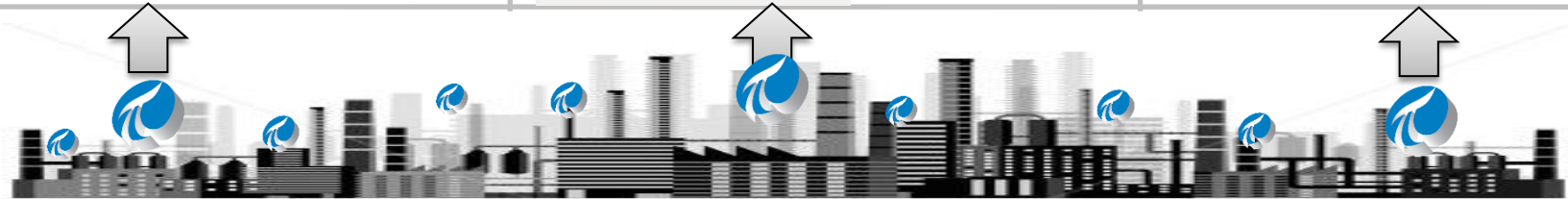
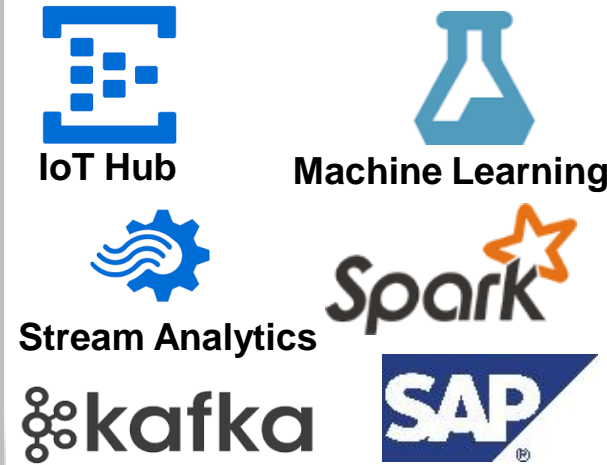
Visual Analytics



Data Warehouse / Data Lake



Streaming Analytics – 2017



	2015-2016	2017	Future
Business Intelligence & Data Warehouses	Available Today PI Integrator for Business Analytics <ul style="list-style-type: none"> Microsoft SQL Server, Oracle Hadoop (HDFS/HIVE) PI Integrator for SAP HANA	Available Cloud Platforms <ul style="list-style-type: none"> Microsoft Azure HANA Cloud Platform (5/2017) 	Considered (2018) More Platforms <ul style="list-style-type: none"> ESRI ArcGIS GeoAnalytics AWS Redshift Teradata
Streaming Systems	Real-Time GIS PI Integrator for Esri ArcGIS <ul style="list-style-type: none"> Situational Awareness Real-Time Geoprocessing Import ESRI features (assets) 	Planned (2H 2017) Stream Systems <ul style="list-style-type: none"> Azure Event Hubs, IoT Hub Apache Kafka SAP SDS (Available 5/2017) 	Considered (2018) Stream Systems <ul style="list-style-type: none"> AWS Kinesis
PI Integrator Framework		Planned (Q4 2017) <ul style="list-style-type: none"> Process Scale out SSL / HTTPS 	Planned (2018) <ul style="list-style-type: none"> All Integrators on common Framework (ESRI) Node Scale Out and HA
New Integration Patterns		Research Enable business process orchestration with PI System data – workflow, asset sync, transaction-like data, MES	Research IoT Platform Integration with 3 rd parties
		Research Enable partners and customers to build applications and interact programmatically using PI Integrator Framework.	

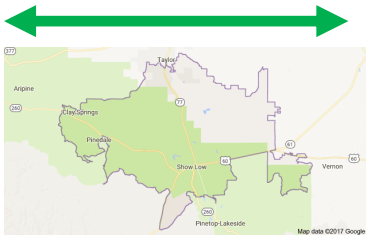
What is a Deep Query vs. a Wide Query?

Deep Query



For meter at 123 Washington St, which days in the last 20 years had missing readings?

Wide Query



Which meters in zip code 85901 had missing readings yesterday?

Types of Wide Queries

- Fleet asset performance
- Pattern Searches
- Aggregates across assets
- Performance diagnosis
- Asset maintenance diagnosis



5

Complementary Cloud Services

The Four Components of our Cloud Strategy

Offer Hosting
Services for the
PI System

Deliver native,
complementary
Cloud Services

Integrate with
others
Cloud Platforms

Make the PI
System more
serviceable

Data driven interconnected industries drives Value

“Sharing this data provides more transparency with our customers ... we have customers for 15 years ... it helps build trust with our long standing partnerships.”

“We have 5-7 contract manufacturers for this product long term. This will not go down, it's the future of our industry.”

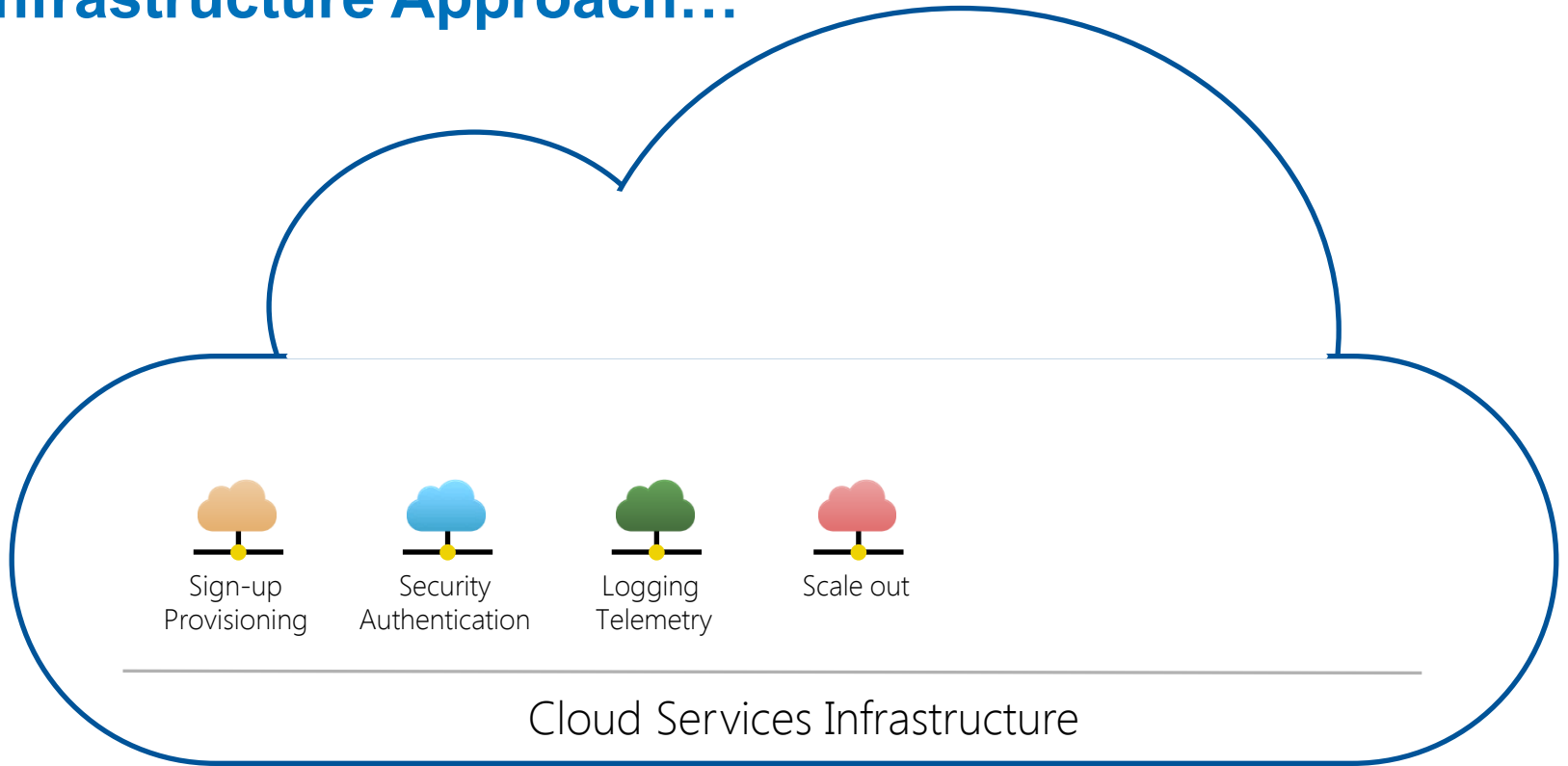
“You have to share data or you're going to get outages.”

“We have some companies that we send forecast data to and they can predict what we should produce with the weather forecast.”

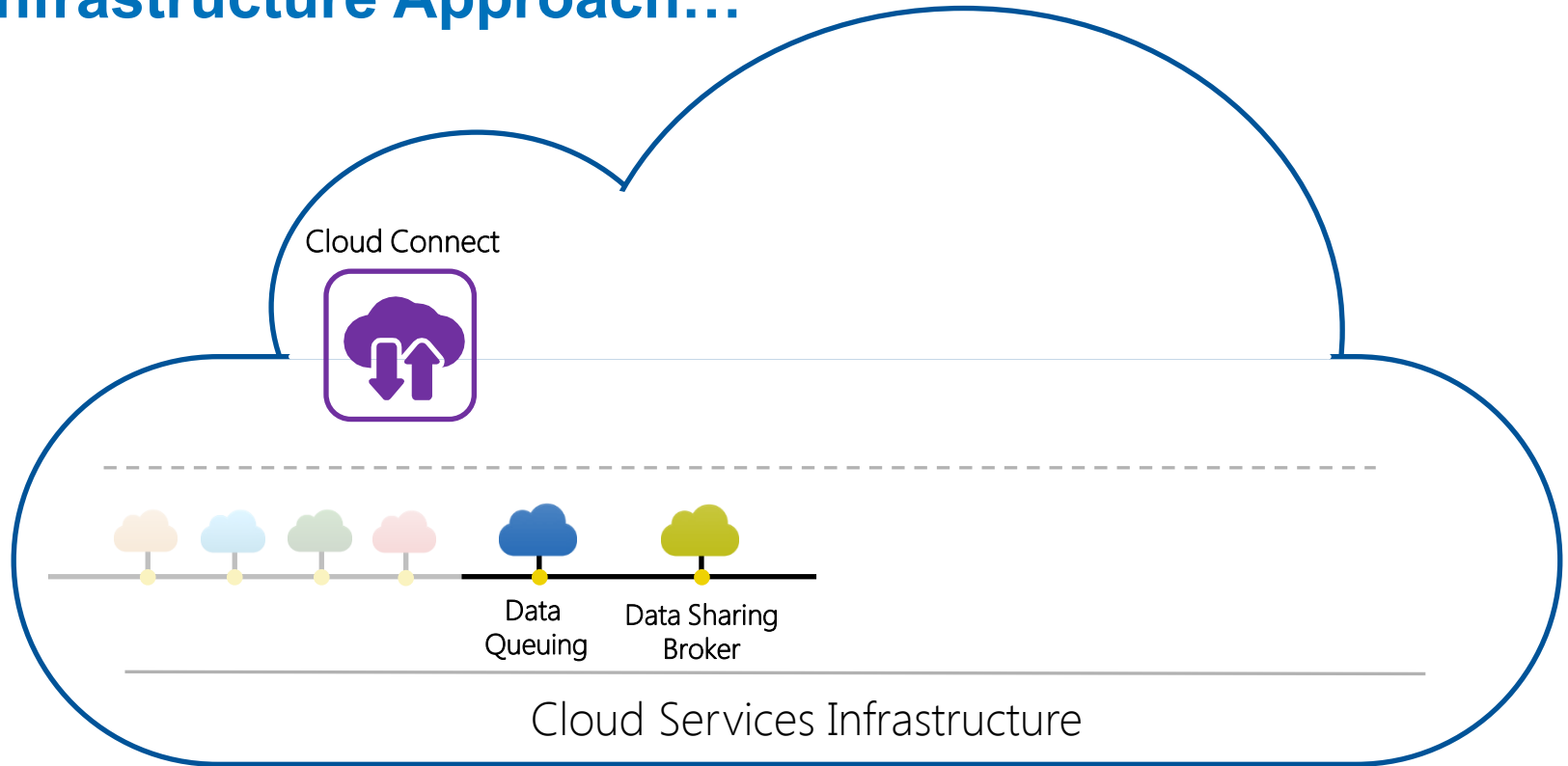
“We have a hosted solution, where we are bringing all the data into our system where the analysis is done and the results and visualizations are pushed back to our clients.”



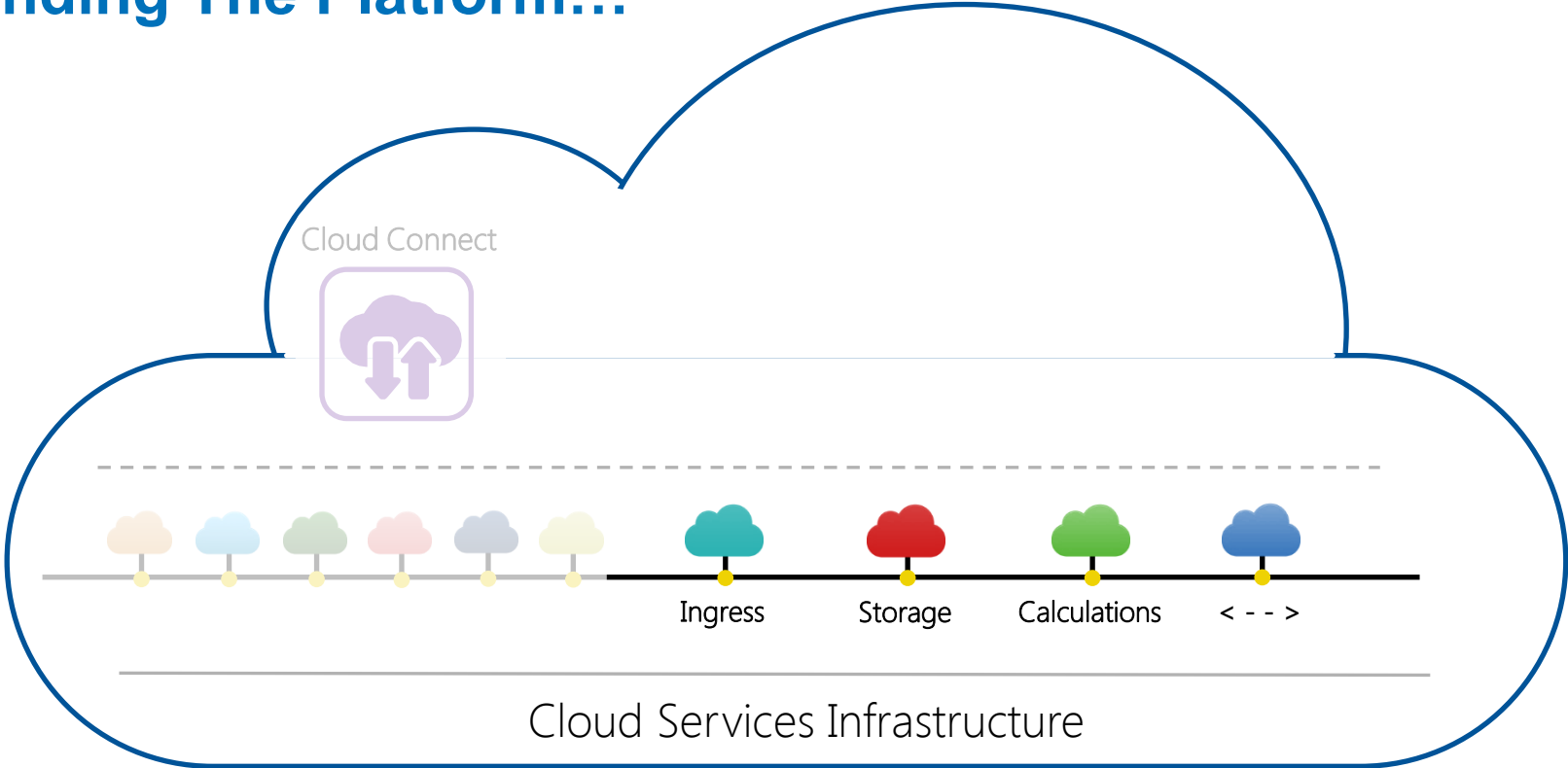
An Infrastructure Approach...



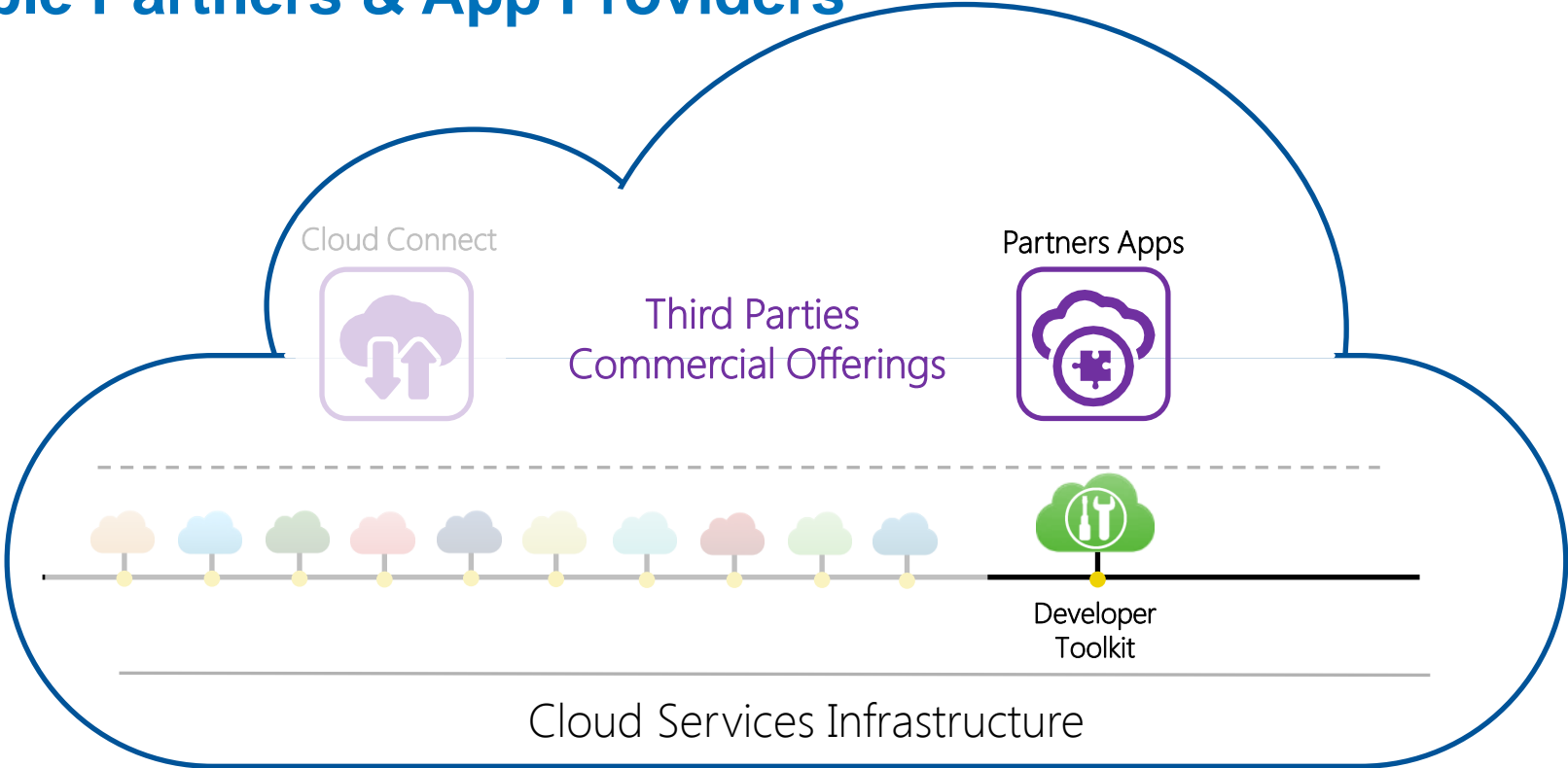
An Infrastructure Approach...



Extending The Platform...

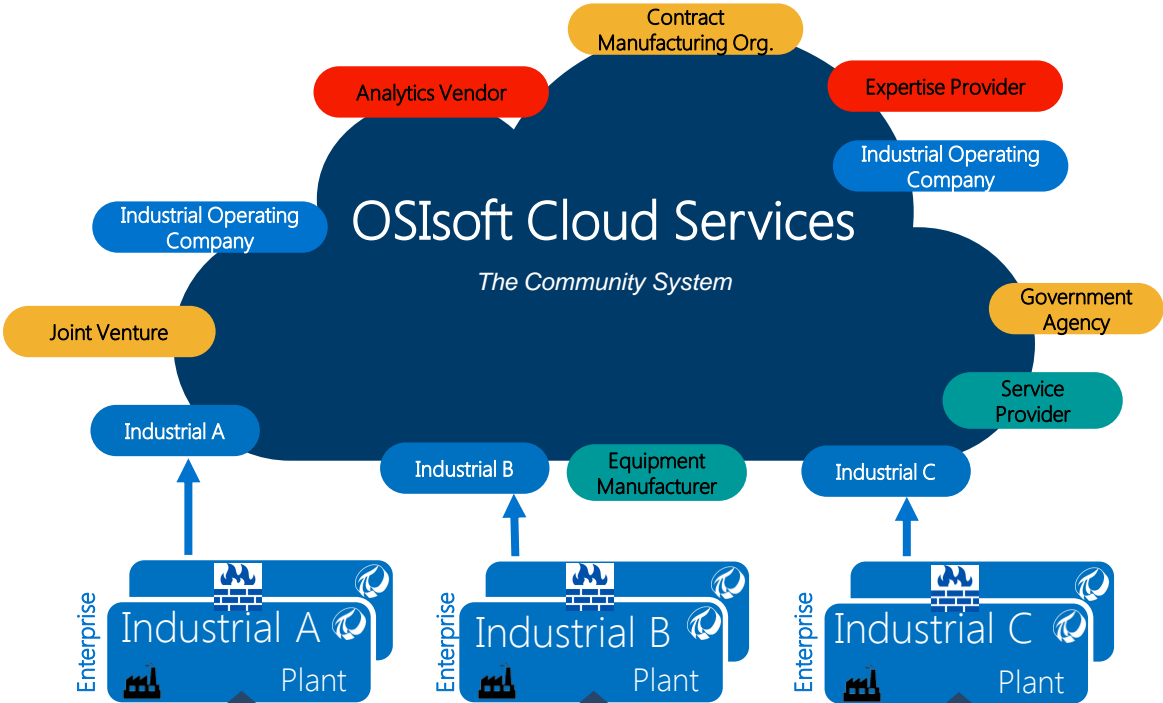


Enable Partners & App Providers



An Ecosystem of Communities Enabling Sharing & Collaboration

-  Industrial Operating Companies
-  Service Providers
 PetaSense SPS Outotec
DATA FIRST
-  Expertise Providers
 ELEMENT ANALYTICS falkonry
-  Your Business Partners



 Process Equipment
  Control Hardware
  IT Hardware
  All Operational Data



- Remote
- Distributed
- Limited Bandwidth

An Ecosystem of Communities Enabling Sharing & Collaboration

Industrial Operating Companies

Service Providers

PetaSense SPS Outotec
DATA FIRST

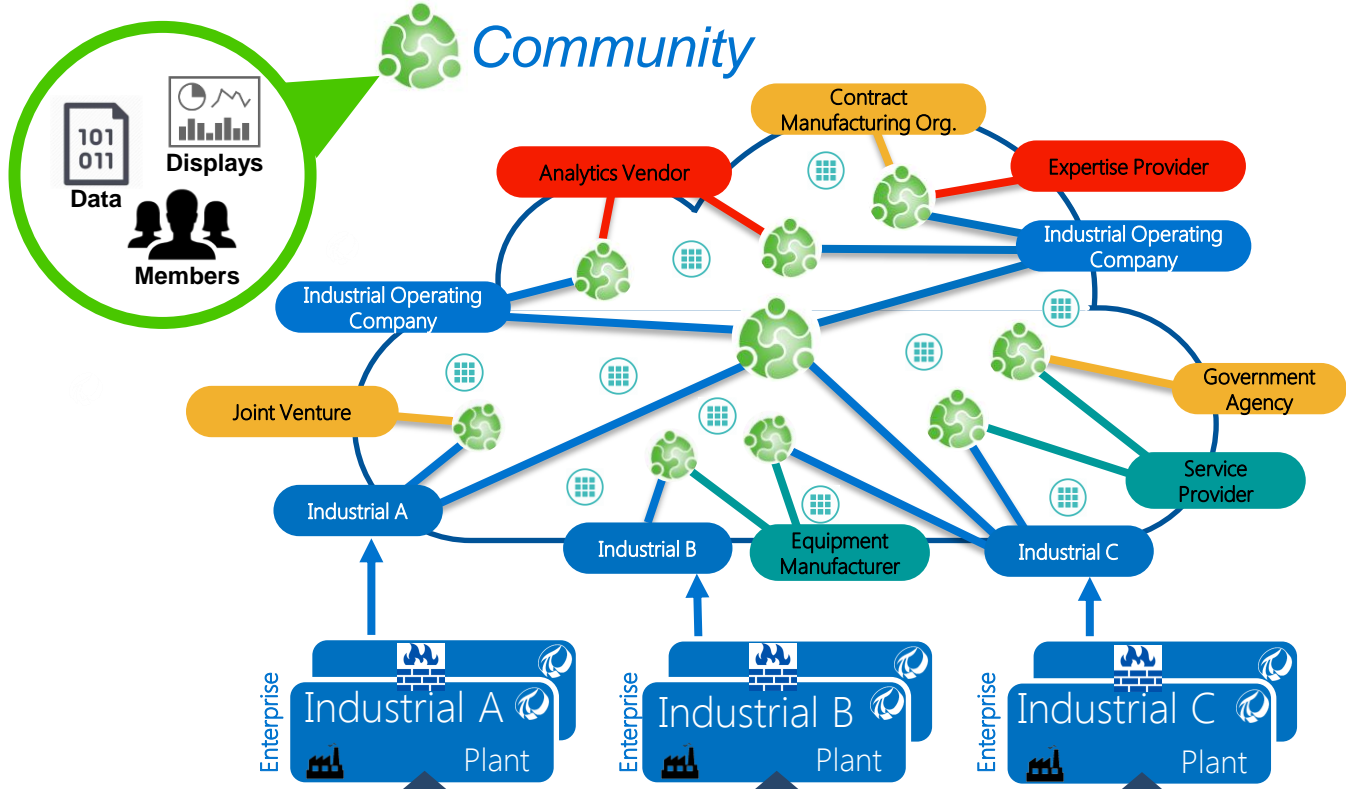
Expertise Providers

ELEMENT ANALYTICS falkonry

Your Business Partners

Partner Apps

esri TrendMiner SAP Seeq



Process Equipment

Control Hardware

IT Hardware

All Operational Data



- Remote
- Distributed
- Limited Bandwidth

Cloud Mid-Term Roadmap

UC NA 2017
San Francisco



UC EMEA 2017
London



Timing TBD



Partner Preview



CTP



<https://feedback.osisoft.com/forums/597811-cloud-services-data-display-sharing>

Questions

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

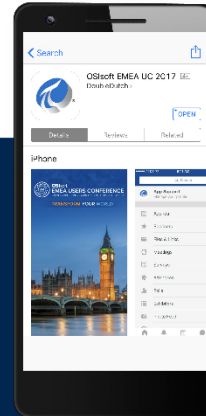


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