

# PI SERVER 2012

## *Do. More. Faster. Now!*

OSIsoft.

# REGIONAL SEMINAR 2012

E M E A

The **Power** of **Data**



**VOYAGE2007**



**Millions of Data Points  
at your Service**


*What's New with the PI Server*

Chuck Muraski  
Rulik Perla  
Denis Vacher

**OSIsoft.**

VALUE NOW, VALUE ON

AUGUST 7, 2007



**PI Server Verrazano**

**Sprint 1 Review**

April 14, 2010

**OSIsoft**

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APRIL 14, 2010

**OSIsoft.**

**USERS** 2012

**CONFERENCE**

The Power of Data

APRIL 24, 2012

# PI SERVER 2010 PERFORMANCE



## 2010 R3

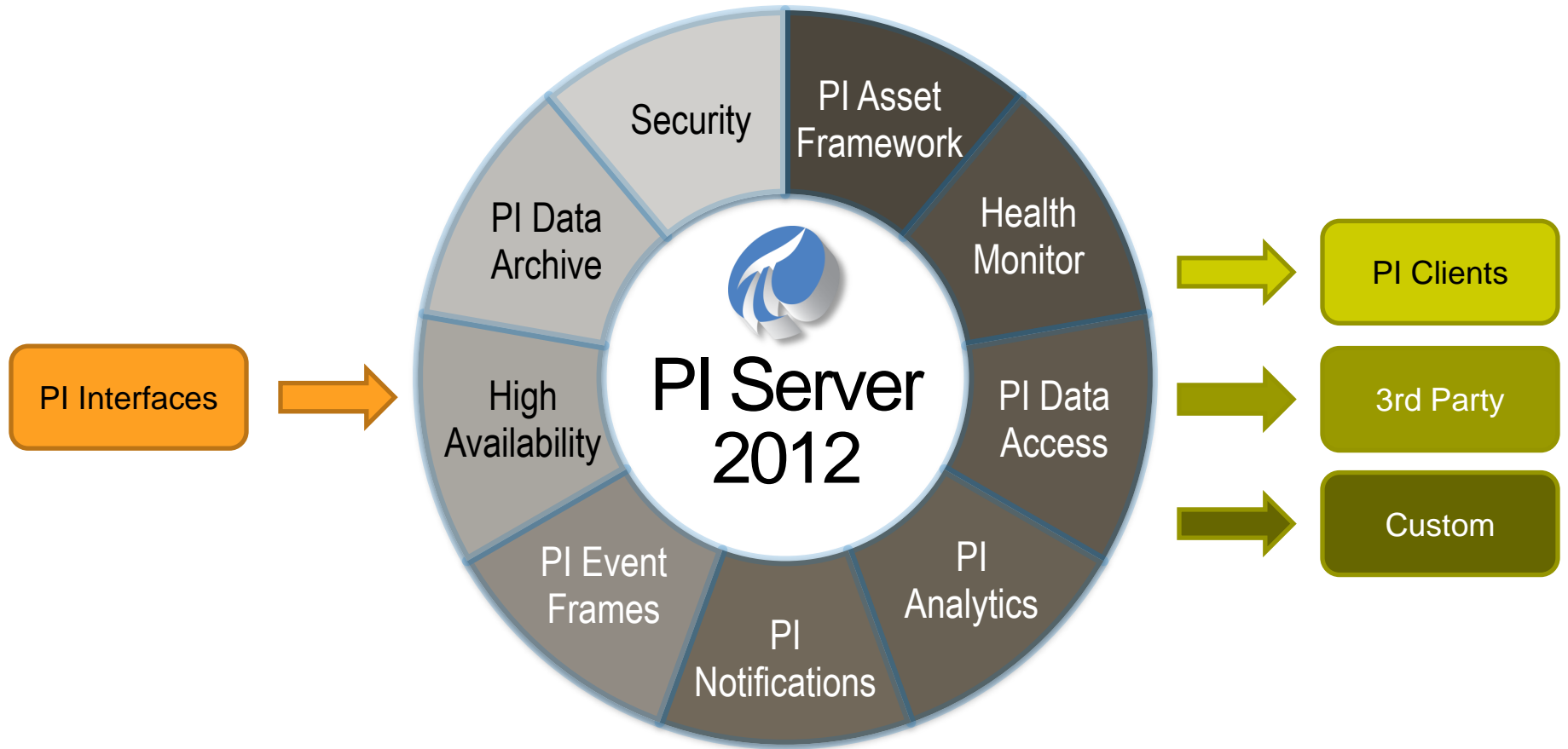
■	Max Point Count	2M+ tags
■	Max Data In Rate	<100K ev/sec
■	Max Data Out Rate	<5M ev/sec
■	Online Archives	2-5K files
■	Real-time Updates	200K signups
■	Point Changes	<10 pt/sec
■	Startup Time	>20 minutes



### Dell PowerEdge R710

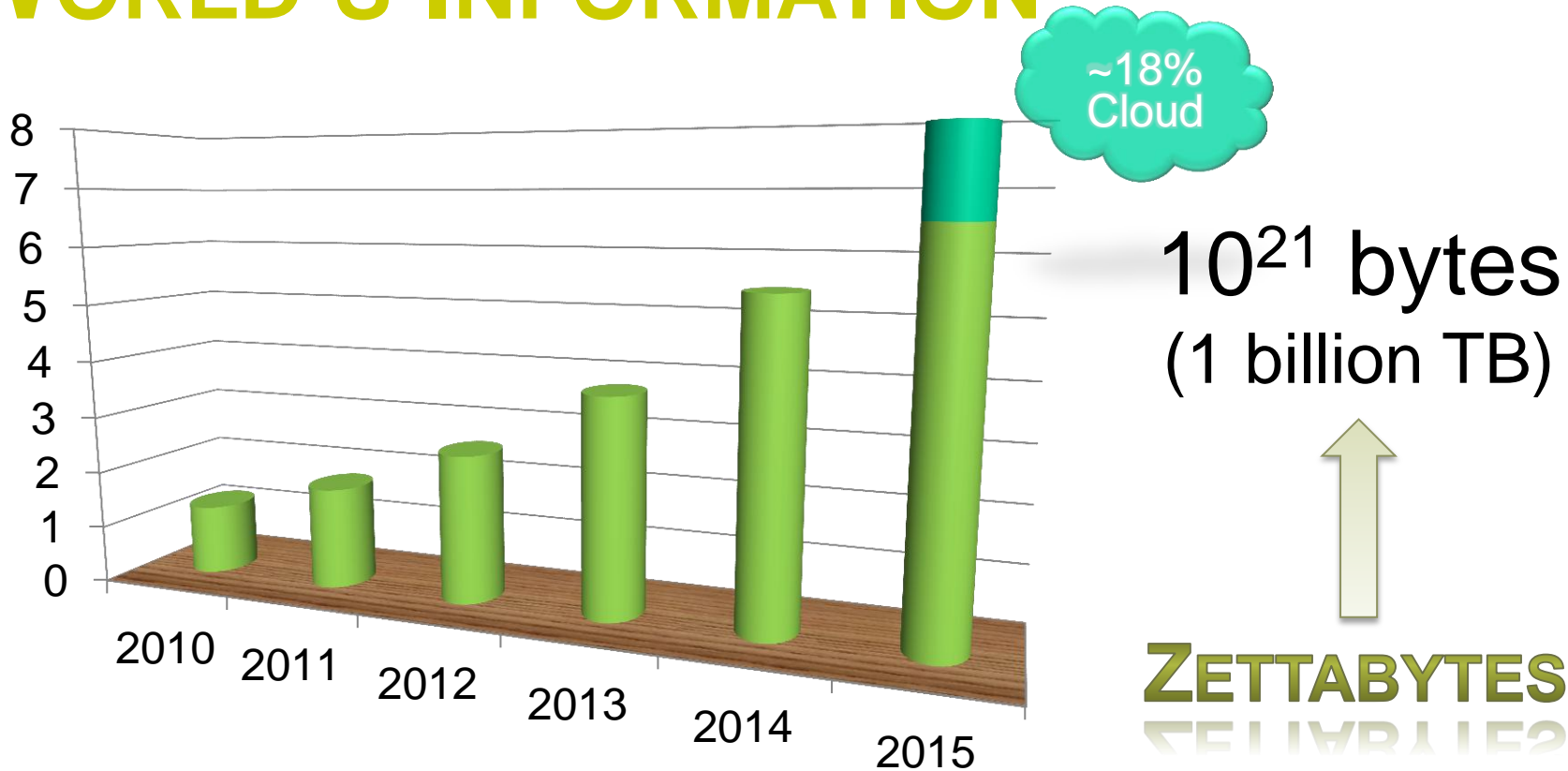
- 2U Dual-Socket Intel
- 12-Core Xeon X5650
- 96GB RAM
- 1.2TB 15K SAS HDDs
- 2 SSDs

MSRP ~\$12,000



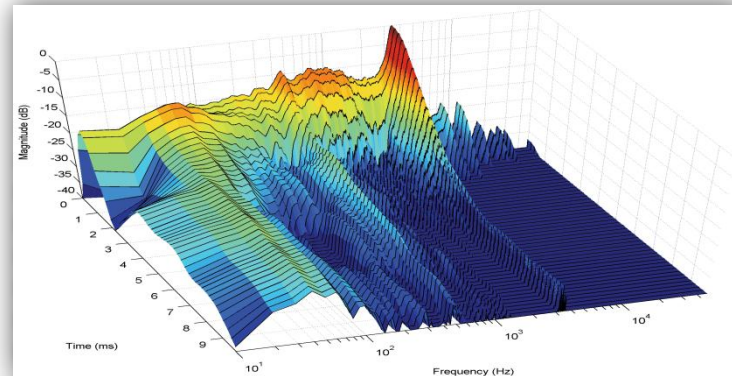


# WORLD'S INFORMATION



Source: <http://www.emc.com/leadership/programs/digital-universe.htm>

# TODAY



## Syncro Phasors

4.8K data streams, 120Hz

3 years online

Unique Events: 55 Trillion

Estimated Data: 430TB



# TODAY



## Data Center

100K cells, 2M breakers

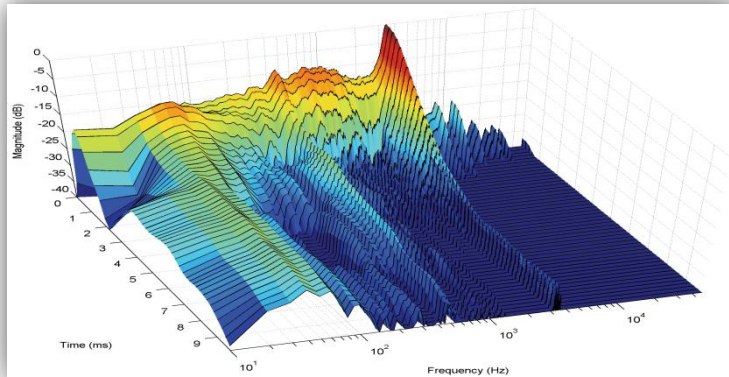
10 years online

Unique Events: 105 Trillion

Estimated Data: 840TB







## Syncro Phasors

4.8K data streams, 120Hz  
 3 years online  
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 10 years online  
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10 years online

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## Automated Metering

20M meters, 5-min reads

7 years online

Unique Events: 177 Trillion

Estimated Data: 1,410TB





## Automated Metering

**1,410**  
TB

20M meters, 5-min reads

7 years online

Unique Events: 177 Trillion

Estimated Data: 1,410TB



## Fleet Monitoring

**50,460**  
TB

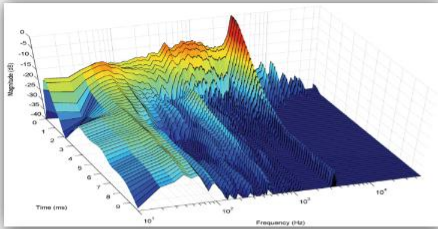
1K assets, 1M points

10 years online

Unique Events: 6,307 Tr

Estimated Data: 50,460TB

# PI SERVER 2012



## Synchro Phasors

4.8K data streams, 120Hz  
3 years online  
Unique Events: 55 Trillion  
Estimated Data: 430TB

430TB



## Data Center

100K cells, 2M breakers  
10 years online  
Unique Events: 105 Trillion  
Estimated Data: 840TB

840TB



## Automated Metering

20M meters, 5-min reads  
7 years online  
Unique Events: 177 Trillion  
Estimated Data: 1,410TB

1,410  
TB



## Fleet Monitoring

1K assets, 1M points  
10 years online  
Unique Events: 6,307 Tr  
Estimated Data: 50,460TB

50,460  
TB



# INFRASTRUCTURE Highway for your data



# SCALABILITY

## More lanes for your DATA



**PERFORMANCE**  
Move your data faster

A photograph of the Golden Gate Bridge in San Francisco, California, taken during sunset. The bridge's iconic red-orange towers and suspension cables are silhouetted against a soft, orange and pink sky. The bridge spans across the water, with a rocky beach in the foreground. The overall mood is serene and majestic.

**RELIABILITY**  
Most stable system  
for your data





**MANAGEABILITY**  
Bring all your data online



SECURITY  
Better protection for  
your data

# PI SERVER 2012 PERFORMANCE



## 2012

■	Max Point Count	5M tags
■	Max Data In Rate	500K ev/sec
■	Max Data Out Rate	5M ev/sec
■	Online Archives	>10K files
■	Real-time Updates	>3M signups
■	Point Changes	>500 pt/sec
■	Startup Time	<2 minutes



### Dell PowerEdge R710

- 2U Dual-Socket Intel
- 6-Core Xeon E5645
- 96GB RAM
- 1.2TB 15K SAS HDDs
- 2 SSDs

MSRP ~\$12,000

# OVERVIEW OF THE OSIsoft NOC

- Monitors health of EA customers' PI Systems worldwide
  - Number of PI Servers Monitored: 871
  - Number of Interface Nodes Monitored: 2387
- Managed PI Production servers – HA Collective
  - 1+ million tags, 118 archives (3 GB each)
  - 350,000 points added last year
- Asset Based (Topology) Structure – PI AF 2010
  - Elements and Attributes created automatically
  - Integrated with OSIsoft's business systems
- Custom Analysis Engine
  - 1000's of health calculations every 5 seconds for every managed endpoint
  - ***Heavy event update load on the PI Servers***

# NOC INFRASTRUCTURE

## Data Acquisition Tier



Web Services

mPI Interfaces

## Data Tier



PI Server Collective

PI Asset Framework

## Analysis & Visualization Tier



NOC Analysis Engine

NOC User Interface

# PI SERVER 2012 IN THE NOC

- PI Server 2012 eliminated need to scale out data tier across additional nodes
  - Prevented potential increase in maintenance
  - Increased scalability
  - Increased reliability
- Upgraded from PI Server 2010 R3 in minutes
  - Rolling HA upgrade, with **Zero Downtime**
- Running PI Server 2012
  - staging for 2+ months
  - **production for 1+ month**
- Reviewing performance and operation with PI Server group on a weekly basis

# DATA BACKFILLING



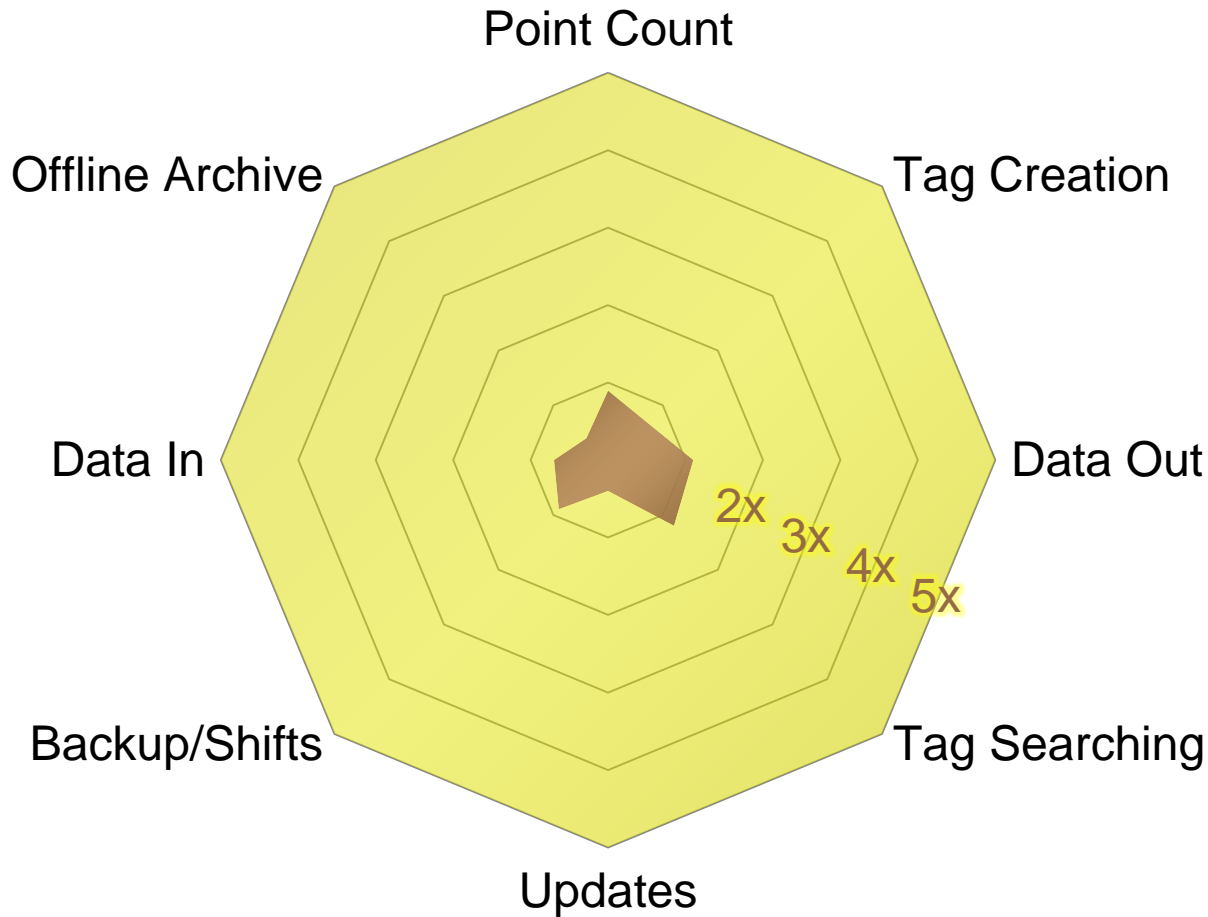
## 2010 R3

- |                      |            |
|----------------------|------------|
| 1 Create PI Points   | Minutes    |
| 2 Delete Pt. Created | Minutes    |
| 3 Check Disk Space   | Minutes    |
| 4 Reprocess Archives | Days/Weeks |
| 5 Create Archives    | Minutes    |
| 6 Backfill Data      | Hours/Days |



## 2012

- |                                 |                  |
|---------------------------------|------------------|
| 1 Create PI Points              | <b>5x Faster</b> |
| 2 <del>Delete Pt. Created</del> | <b>Zero</b>      |
| 3 Check Disk Space              | Minutes          |
| 4 <del>Reprocess Archives</del> | <b>Zero</b>      |
| 5 Create Archives               | Minutes          |
| 6 Backfill Data                 | <b>5x Faster</b> |



# 5x

- PI Server 2012
- PI Server 2010





# PI SERVER 2012 PERFORMANCE



## 2012

■	Max Point Count	20M+ tags
■	Max Data In Rate	1M ev/sec
■	Max Data Out Rate	20M ev/sec
■	Online Archives	>50K files
■	Real-time Updates	10M+ signups
■	Point Changes	2,000 pt/sec
■	Startup Time	<10 minutes



### Dell PowerEdge R910

- 4U Quad-Socket Intel
- 8-Core Xeon E7-4830
- 256GB RAM
- 4.2TB 15K SAS HDDs
- 2 SSDs

MSRP ~\$38,000



## 2010 R3

■	Max Point Count	2M+ tags
■	Max Data In Rate	<100K ev/sec
■	Max Data Out Rate	<1M ev/sec
■	Online Archives	<10K files
■	Real-time Updates	200K signups
■	Point Changes	<10 pt/sec
■	Startup Time	>20 minutes



## 2012

■	Max Point Count	20M+ tags
■	Max Data In Rate	1M ev/sec
■	Max Data Out Rate	>10M ev/sec
■	Online Archives	>50K files
■	Real-time Updates	10M+ signups
■	Point Changes	2,000 pt/sec
■	Startup Time	<10 minutes



# PI SERVER 2012 PERFORMANCE



2012

■	Max Point Count	10K+ tags
■	Max Data In Rate	>40K ev/sec
■	Max Data Out Rate	>100K ev/sec
■	Online Archives	>1K files
■	Real-time Updates	>5K signups
■	Point Changes	>50 pt/sec
■	Startup Time	<1 minutes



Dell OptiPlex  
SX-260

- 32-bit Architecture
- Pentium 4 3GHz  
(1 CPU Core)
- 1GB 266MHz DDR RAM
- 40GB 5.4K IDE HDD

eBay ~ \$30

# PLATFORM SCALE?



# 2012

Max Point Count	20M+ tags
Max Data In Rate	1M ev/sec
Max Data Out Rate	>10M ev/sec
Online Archives	>50K files
Real-time Updates	10M+ signups
Point Changes	2,000 pt/sec
Startup Time	<10 minutes



# 2012

Max Point Count	5M tags
Max Data In Rate	500K ev/sec
Max Data Out Rate	5M ev/sec
Online Archives	>10K files
Real-time Updates	>3M signups
Point Changes	>500 pt/sec
Startup Time	<2 minutes



# 2012

Points	10K+ tags
Data In	>40K ev/sec
Data Out	>100K ev/sec
Online	>1K files
Updates	>5K signups
Points	>50 pt/sec
Startup	<1 minutes





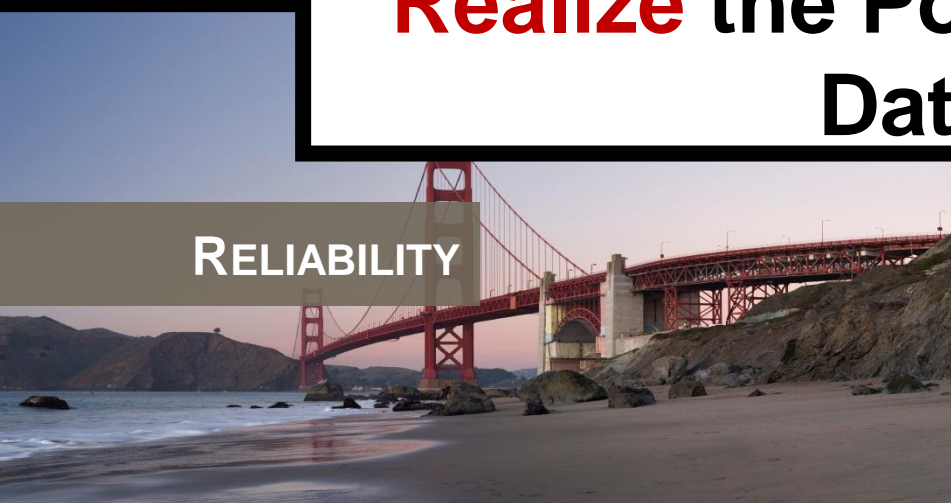
SCALABILITY



PERFORMANCE

# PI Server 2012

## Realize the Power of Your Data



RELIABILITY



SECURITY

# WHO'S USING PI SERVER 2012?

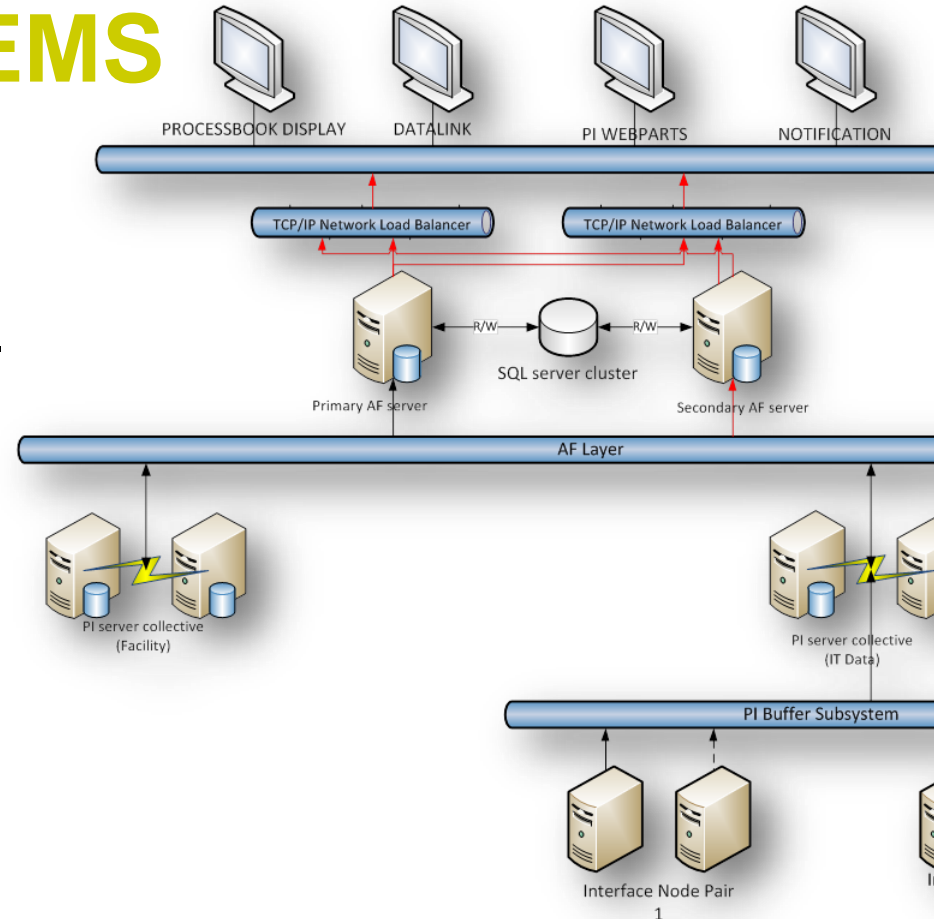


# OSISOFT NOC



# OSISOFT IT SYSTEMS

- ✓ 20 OSISOFT Office Locations
- ✓ Servers
  - CPU, Memory, Disk Space, etc.
- ✓ Network
  - Ping Time, Bandwidth, Errors
- ✓ Facilities
  - Building Power Usage
  - Rack Load
  - UPC Battery Status
  - Cooling (HVAC, temperature)
- ✓ More...



# TECHNOLOGY ADOPTION PROGRAM

8 Customers

9 Partners





<http://techsupport.osisoft.com>

**RC0 AVAILABLE TODAY.**

**Send us your feedback:**  
[BetaPIserver@osisoft.com](mailto:BetaPIserver@osisoft.com)



# THANK YOU

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