



Real-time Information System (RTIS) High Availability Project at RasGas

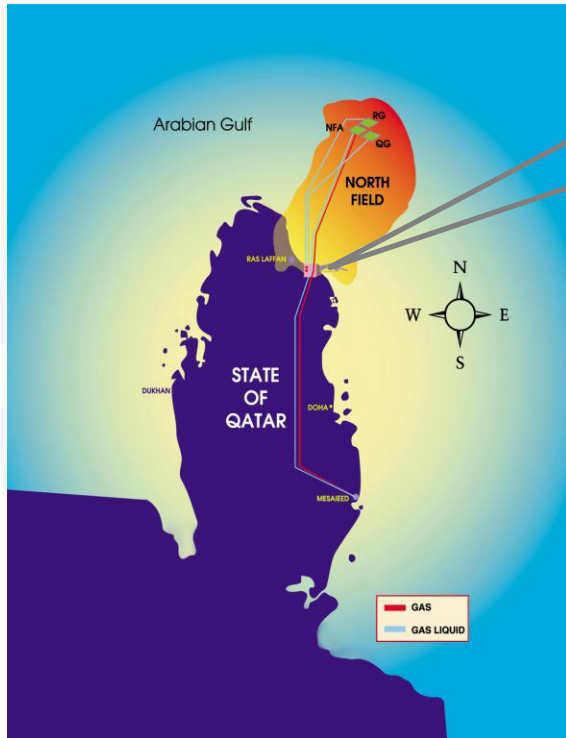
Presented by

Jassim Al-Shammali

Mohammad Shamsul

RasGas Company Limited

RasGas Company Overview



RasGas Company Limited (RasGas) is a Qatari joint stock company established in 2001 by Qatar Petroleum (70 percent) and ExxonMobil (30 percent). It acts as the operating company for and on behalf of the project owners:

- Ras Laffan Liquefied Natural Gas Company Limited 'RL'
- Ras Laffan Liquefied Natural Gas Company Limited (II) 'RL (II)'
- Ras Laffan Liquefied Natural Gas Company Limited (3) 'RL (3)'
- Al Khaleej Gas Project (AKG-1 and AKG-2)
- Ras Laffan Helium 1 and 2
- Barzun Gas Company Limited (Barzan Gas Project) – 2014



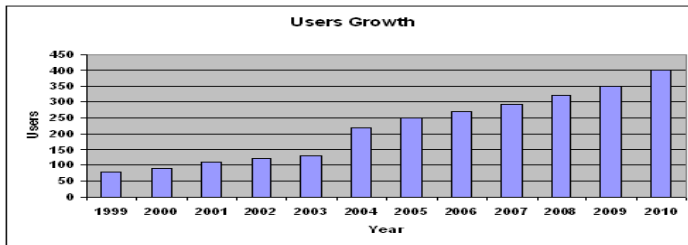
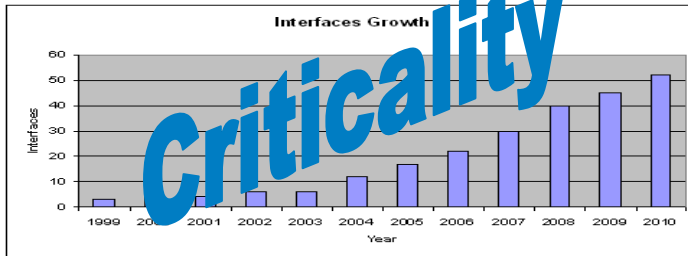
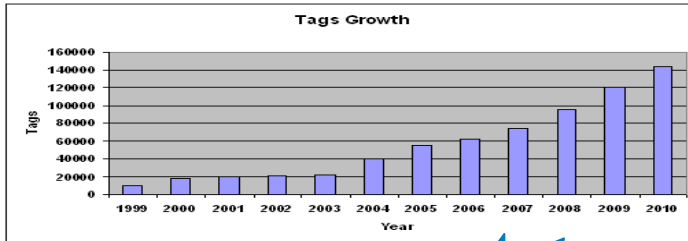
Phase 1: Upgrade Project

Presented by:
Jassim Al-Shammali
Senior Engineer (Controls - DCS)

RasGas RTIS Overview

| | RasGas Expansion Project (RGX-1) | RasGas Expansion Phase 2 Project (RGX-2) |
|-------------|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| Area | Trains 1, 2, 3, 4, 5, Helium, Al-Khaleej Gas Project (AKG-1), Utilities, Offsite, Offshore, Electrical Data (ELICS) | Trains 6, 7, AKG-2, Offshore (New wellheads) |
| Server Name | RTIS02 | RTIS67 |
| Tag Counts | 75,000 | 69,000 |
| Redundancy | High Availability | Virtual Server |

Why We Upgraded to High Availability



Criticality

| 2010 Failures | Severity |
|-------------------------------------------|----------|
| • 21 Jan: PI Archive sub (rapidly growth) | H |
| • 10 Jan: DCS I/O Timeout | H |
| • 13 Jan: TR4 int shut | M |
| • 22 Jan: HW Failure | M |
| • 5 Feb: CS1 low memory | M |
| • 8 Feb: 31AW11 virus | L |
| • 20 Feb: 51AW bus | M |
| • 26 Feb CS1 backup fail | M |
| • 27 Feb hard d | M |
| • 3 Mar: All Ser | H |
| • 7 Mar: archives CPU 100% - sluggish | L |
| • 25 Mar: TR5 , DCS FoxAPI freeze | L |

Reliability

Severity:

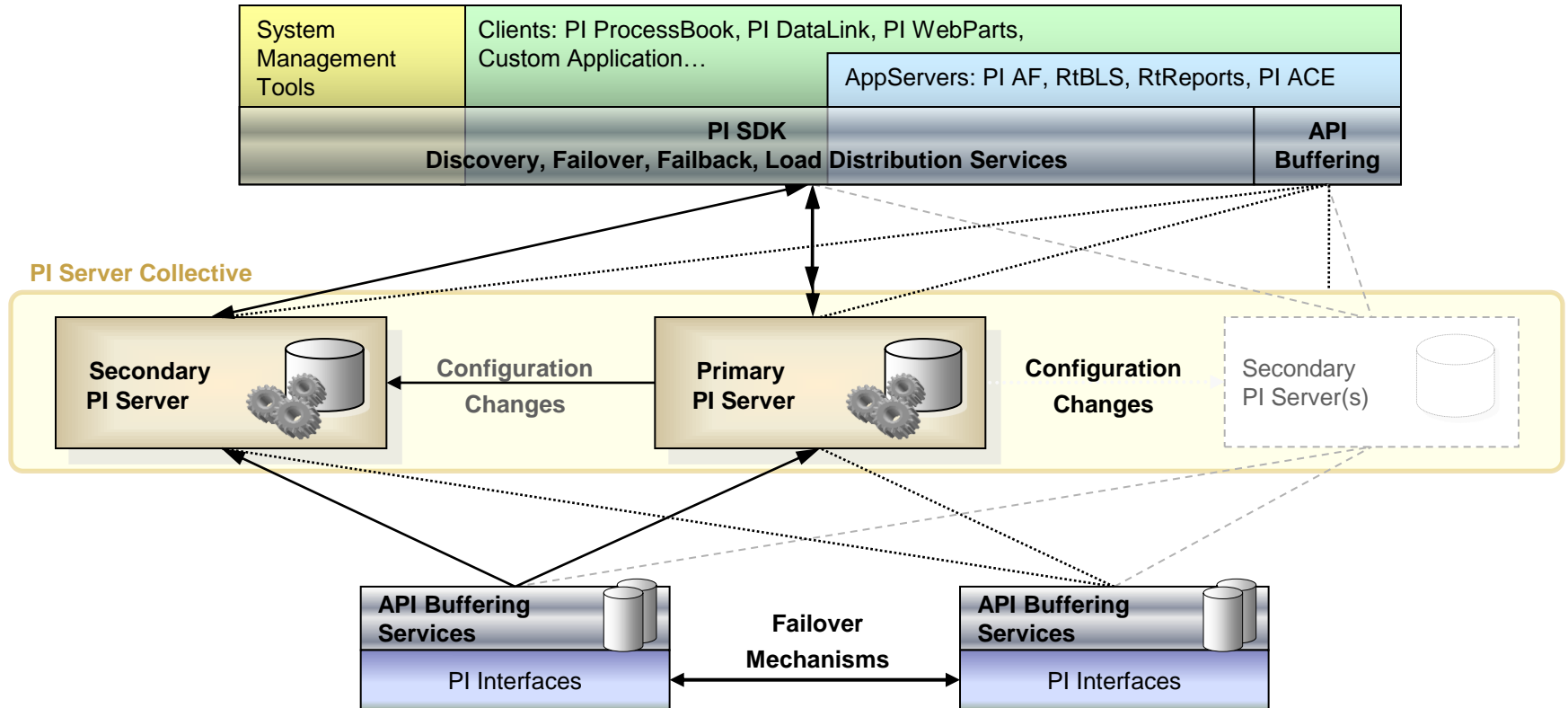
H: C&S; M: Call-out; L: Failure during checks



Audits, Cold Fy Review
RCFA

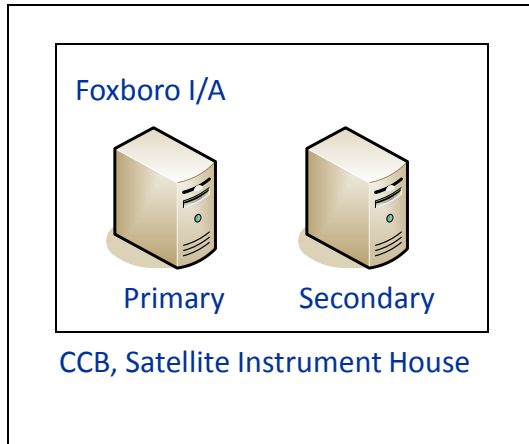
**Integrity,
Security**

High Availability Strategy

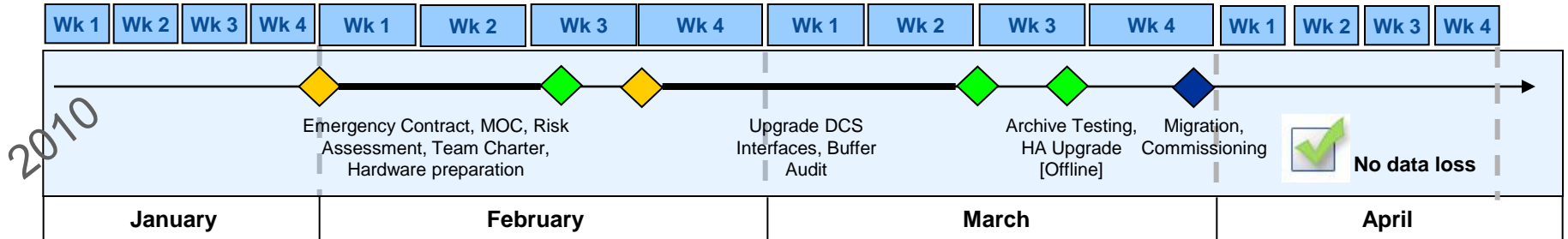
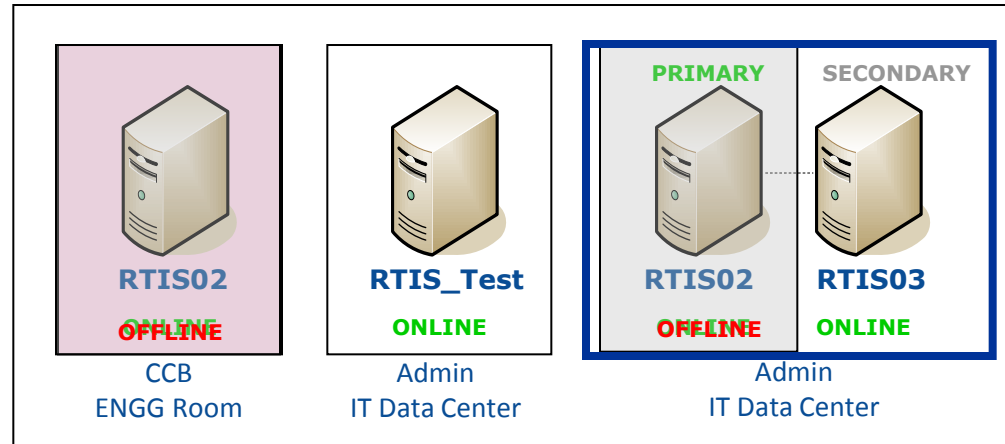


High Availability Upgrade Steps & Challenges

Upgrade DCS Interfaces



Archive Testing, Migration & Commissioning



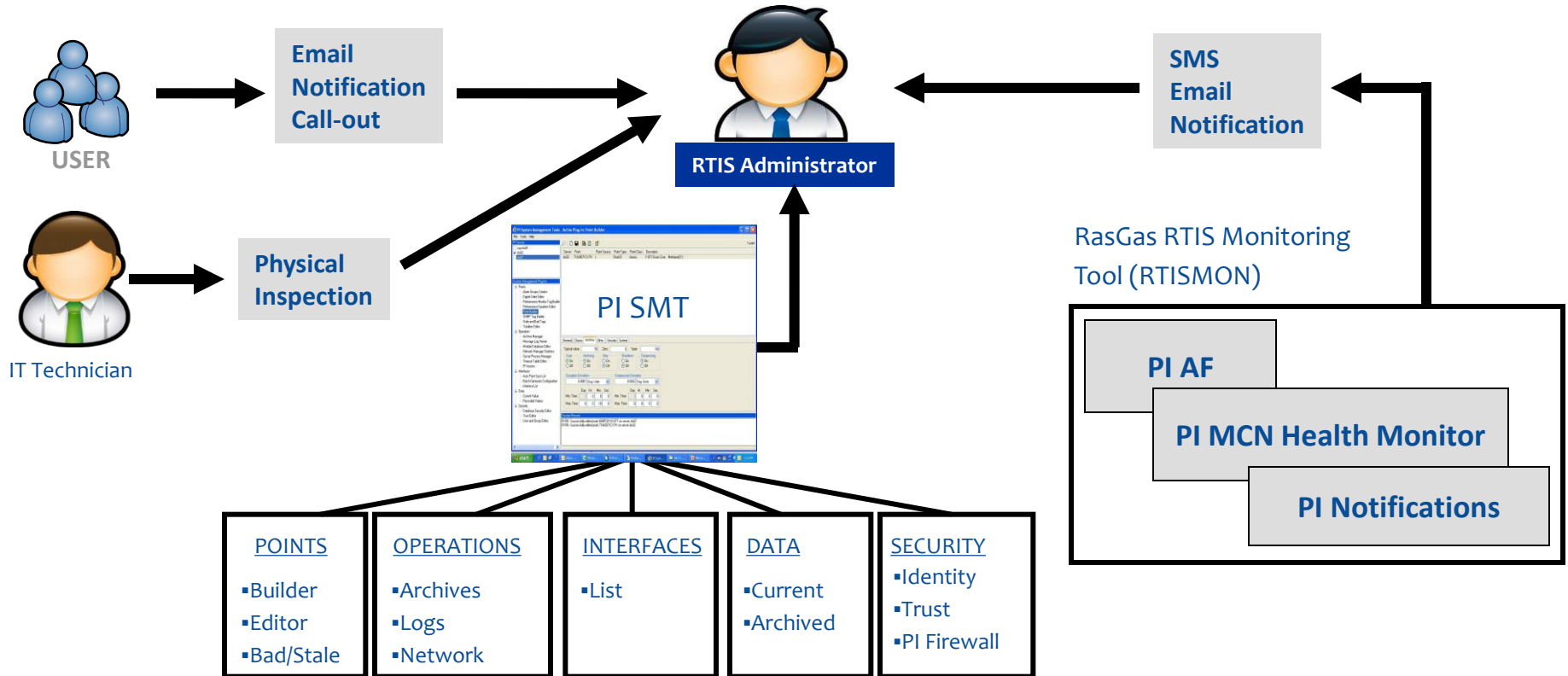
Resources: ◆ RasGas ◆ RasGas and EMI



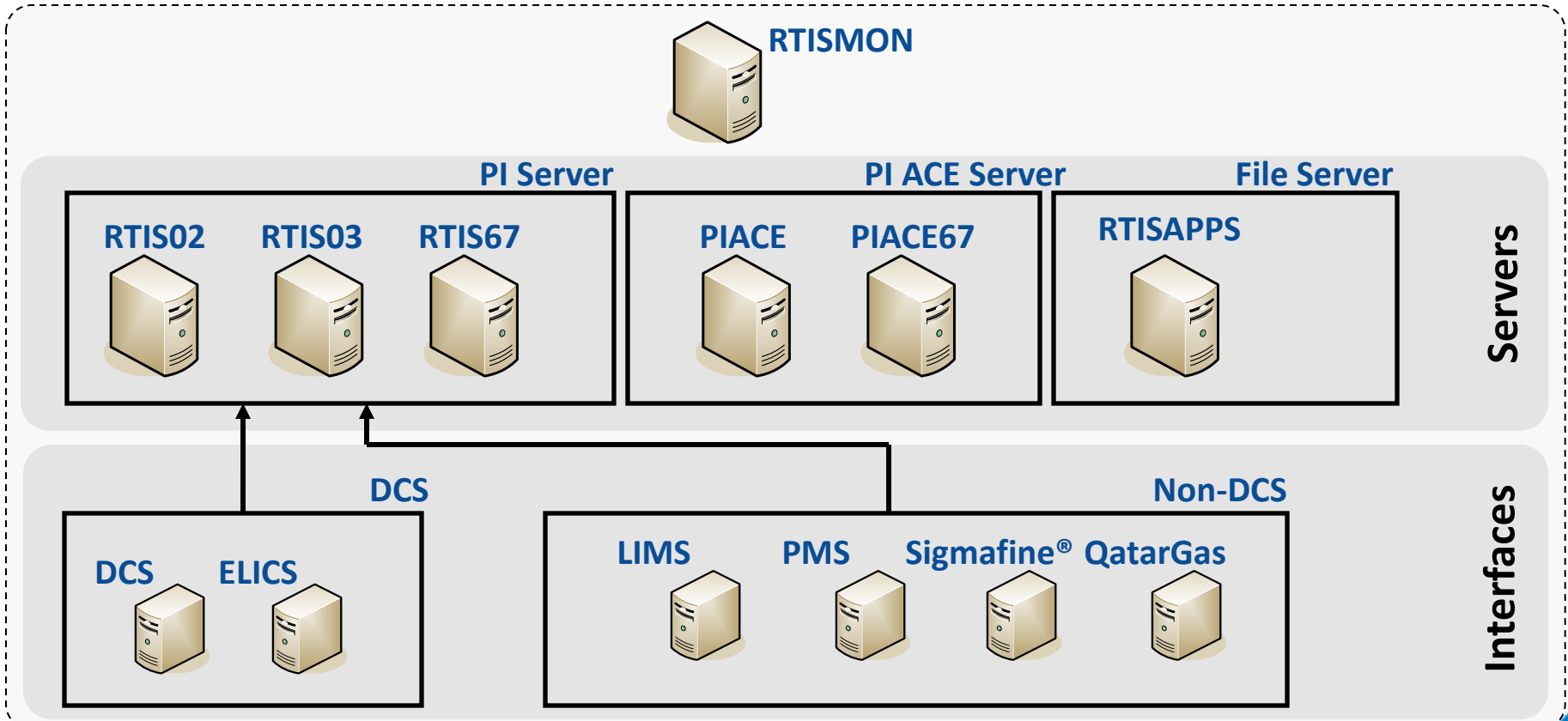
Phase 2: Monitoring Tool

Presented By:
Mohammad Shamsul
Senior Engineer (Controls – RTIS)

RTIS Monitoring Process

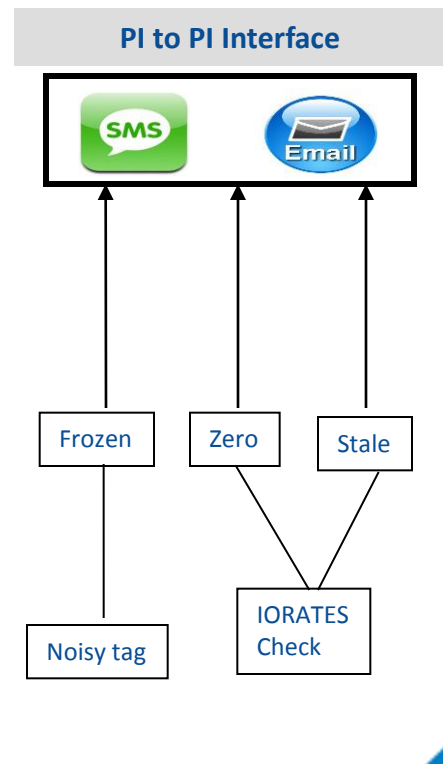
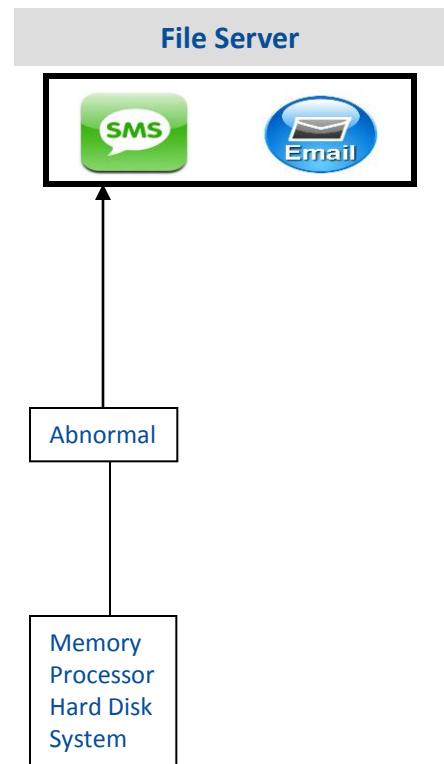
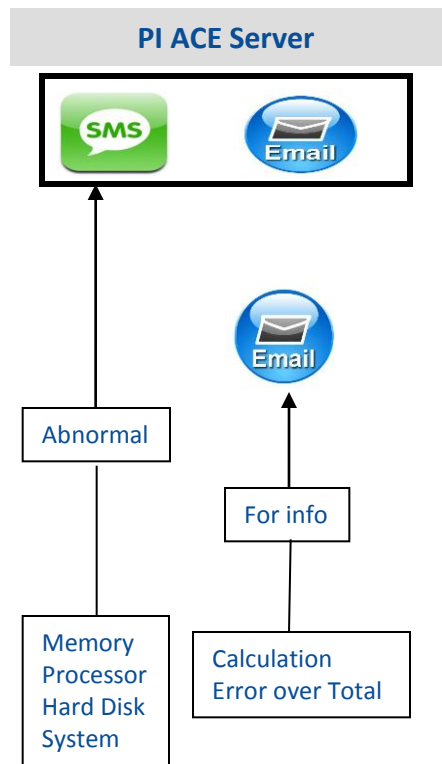
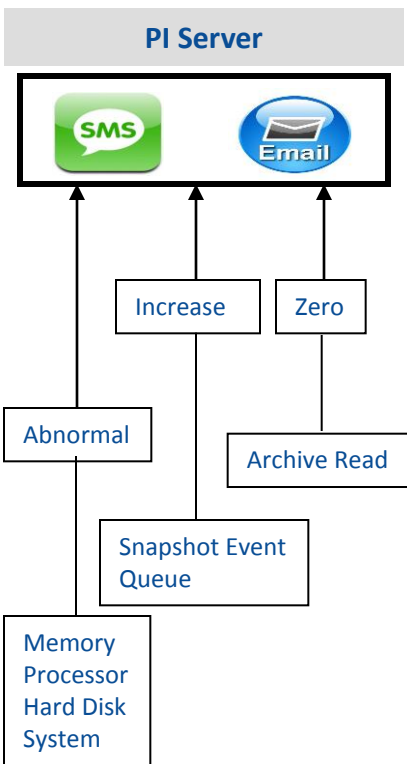


RTISMON Architecture



Monitoring Rules (Servers Side)

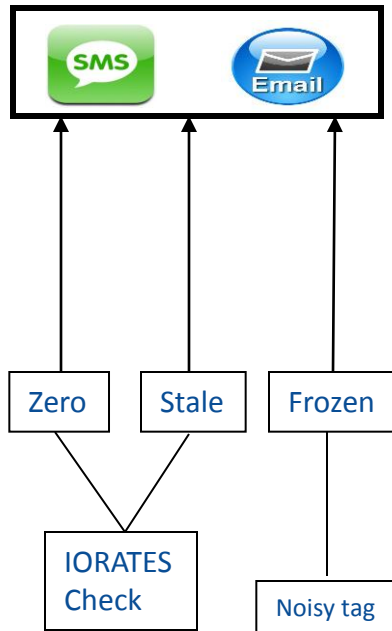
* Note: PING test applied to all



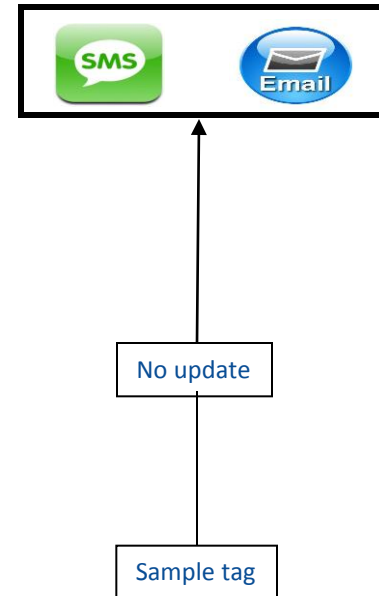
Monitoring Rules (Interfaces Side)

* Note: PING test applied to all

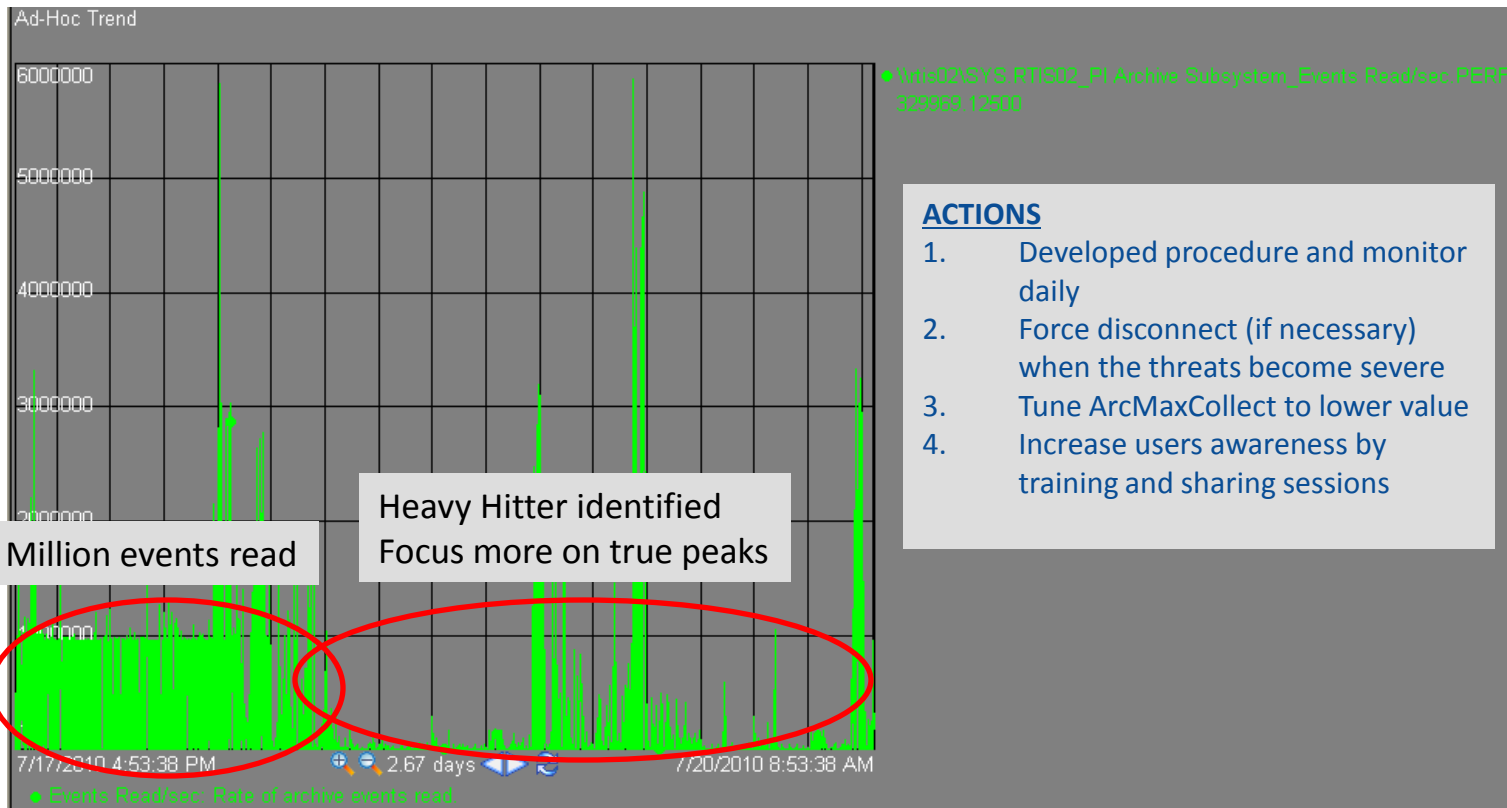
DCS Interfaces



Non-DCS Interfaces



PI Archive Sub-system Case Study





Improvements and Benefits

- **Criticality**: *growing number of users, interfaces and critical data into RTIS, uninterrupted data*
- **Reliability**: *address obsolescence due to aging hardware and PI System version*
- **Integrity**: *take advantage of latest PI System surveillance tools*
- **Security**: *utilizing PI System security features for data security*



Future Plans and Next Steps

- Upgrade RGX-2 RTIS server to High Availability
- Database tuning
- Develop RTIS KPI / Performance report



Questions?

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Thank you