Leveraging the PI System at Origin Generation MSC

Presented by **Steve Miller**

SPEAKER

Steve Miller, Managing Director - Optimate Pty Ltd

- He will try to talk himself up but …
- He's just an Old Dude that used to be in a Band
- Blew his dough on drugs, women and motorbikes
- Had to get back into engineering to pay the bills

AGENDA

- About Optimate
- About Origin Generation MSC
- MSC PI System Implementation
- Methodology
- Business Benefits
- Common Integration Issues

ABOUT OPTIMATE

Our Locations

- Head Office Milton, Brisbane
- Perth, WA
- Houston, Texas

Our People

- 7 Principle Engineers / Consultants
- 16 Senior Systems / Software Engineers
- 5 Systems / Software Engineers
- 3 Admin personnel
- 2 Sales Managers
- Contract personnel

KEY INDUSTRIES / CUSTOMERS

Optimate
POWERING OPERATIONAL INTELLIGENCE

Oil and Gas

Chevron

AUSTRALIA PACIFIC LNG

Power

origin

alintaenergy

snowyhydro Limited
renewable energy

stanwell
create. generate. innovate.

Energy Developments

Mining

bhpbilliton

CITIC PACIFIC MINING

ROY HILL

Water

SA Water

WATER CORPORATION

PowerWater

ABOUT ORIGIN GENERATION

- The leading provider of energy to homes and businesses throughout Australia, and a major energy provider in New Zealand and the Pacific

- 6,000 MW Generation Portfolio –
  - Coal, Natural Gas, Wind and Hydro

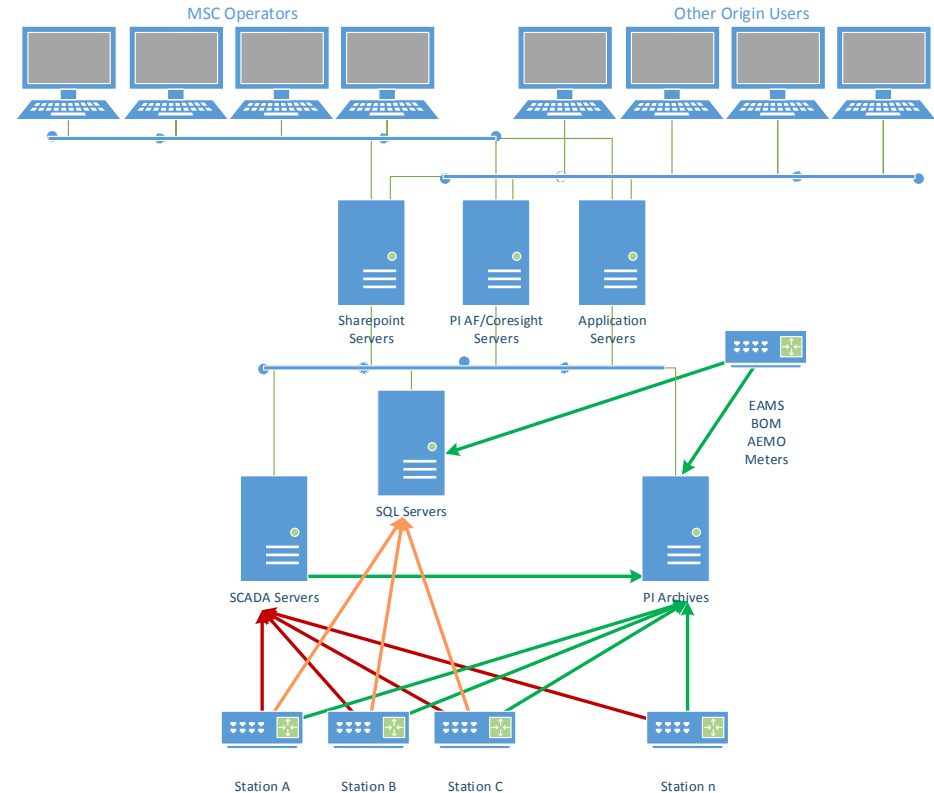- In 2010, expansion plans prompted the business to improve the efficiency and scalability of operations.

ABOUT MONITORING & SUPPORT CENTRE

- 10 Generation Sites, > 30 units,

- Monitoring & Support Centre established in 2012 to centrally monitor and support all sites.
  - Single point of call for dispatch
  - Monitoring of dispatch
  - View real-time data from all sites
  - Actively monitoring starts and load compliance
  - Central fault diagnosis and resolution
  - Performance optimisation

MSC SYSTEM IMPLEMENTATION

- MS SQL Server Cluster
- MS Sharepoint Server Farm
- PI Enterprise Agreement
- PI Collective (150,000 points)
- PI Server - Asset Framework, Analysis, Notifications, Event Frames
- PI ACE
- PI Visualisation Suite
- PI Web Parts
- Siemens T3000 and M3000

MSC Operators — Other Origin Users

Sharepoint Servers — PI AF/Coresight Servers — Application Servers

EAMS BOM AEMO Meters

SQL Servers

SCADA Servers — PI Archives

Station A — Station B — Station C — Station n

MSC PROJECT CHALLENGES

A Couple of the bigger challenges for the MSC Project were:-

- Aligning existing systems and data into "Portfolio" information models
  - Asset model in EAMS was unique for each site
  - Logic and naming standards were unique to each site

- Integration of key data from external systems
  - EAMS Asset Management System
  - AEMO, BOM, Meter Data

INITIAL APPROACH

- Step 1 – Sent letter to all Asset Maintenance System Vendors asking them to upgrade their systems to comply with NERC and IEC61970 / 61968 by the end of the month.

- Step 2 – Sent insistent emails to all Control Systems Vendors informing them that their systems didn't comply with IEC61970 / 61968 and if they didn't fix it in the next two weeks I would tell on them.

Vendors

- We were a little surprised at how unhelpful but descriptive some of the responses were. ☺

DESIGNING THE INFORMATION MODELS

- Extensive use of PI Asset Framework to conform the data
- Software developed to identify, create and test correlations from sources (Forge)
- Forge used for iterative development of information model(s) for all sites
- Initial information models developed were NERC / ISA95 / Origin Hybrid for:-
  - Gas fired power stations
  - Wind power stations
- Initial information models designed for tag management

INTEGRATION OF EXTERNAL SYSTEMS

- Console application developed to manage services for:-
    - EAMS Asset Management System data changes
    - AEMO data changes
    - Bureau of Meteorology data
    - Custodial Meter data
    - Capture read / stale data status for health monitoring

BUSINESS FEEDBACK

- MSC System Implementation (Jim Cooley, Manager MSC Systems)
  - "Significant reduction in time to respond to production critical events"
  - "Improved production performance"
  - "Centre of excellence for operational improvement across all our Assets"

- Data Management (Russell Turner, Senior Operations Capability Engineer)
  - "Forge enables us to rapidly generate hierarchies and put them in front of users"
  - "Overall complexity of AF Structure significantly reduced"
  - "Changes only made in one place"

INTEGRATION LESSON

- There is one lesson that we keep finding on larger projects, e.g.:-
  - Chevron Wheatstone Upstream and Downstream - 650,000 PI Points
  - BHP Billiton Iron Ore – 2,000,000 PI Points
  - APLNG Upstream – 1,000,000 PI Points

- A Data Management methodology is essential:-
  - It must be flexible to work with and around existing systems of record and MoC.
  - It must be agile to accommodate persistent changes from a wide user group
  - It must be effective to ensure continued confidence in the data for all users

- Some industries have maturing standards as exemplified by Frank Maio from ElectraNet in his presentation in the 2014 PI System Roadshow.

THANK YOU FOR YOUR TIME

Any Questions

SPEAKER

Please feel free to contact:-

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SITE COMMUNICATIONS

Problem

- Each site had different / multiple types of control and ancillary systems

Objective

- A common extensible approach to reduce design and maintenance effort

Solution

- Utilised an OPC Architecture
  - Common architecture across all sites
  - Redundancy for both SCADA and PI Interfaces
  - Optimised comms read requests from SCADA and PI Interface to control system
- Alarm Collectors for all site generated alarms
- Portfolio Alarm Monitoring System