



From Speculate to Substantiate – Deciphering the Clues to a Monitoring System's Performance Gremlins

Glen Juback
Senior Engineer – GE Power
Process and Data Quality Improvement for Monitoring & Diagnostics

Vidhya Sagar Reddy Arumalla
Systems Architect – Tech Mahindra

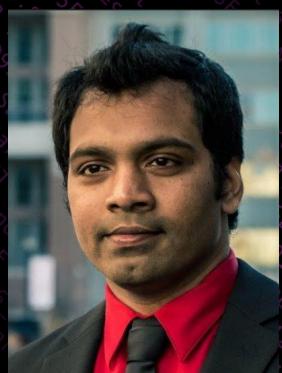




splunk>



Glen Juback
BSME Michigan State 1983
General Motors – Advanced Manufacturing 1984-1996
GE Plastics – Manufacturing Consulting 1996-2005
GE Power - Monitoring & Diagnostics 2005 to present



Vidhya Sagar Reddy Arumalla aka Maddy
MSME Clemson 2010
Project Manager for Analytics and Splunk at Tech Mahindra
Splunk Solution Architect and Systems Architect at GE Power
Focused on Predictive Maintenance, Automations and Integrations

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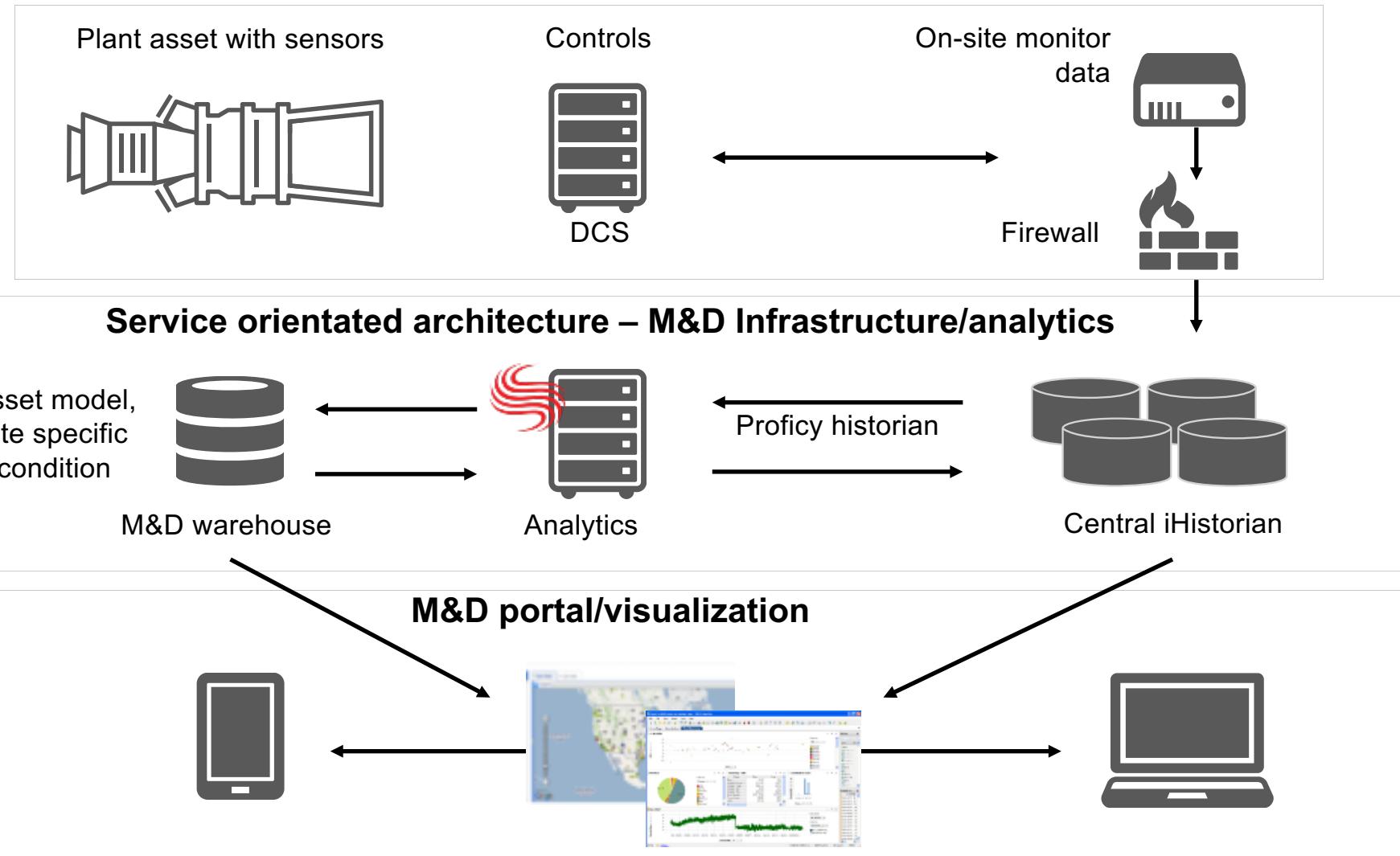


24 x 7 Global operations
900+ power plants
70+ countries
\$360MM customer value

~6000 monitored assets incl.
2500+ gas turbines
400+ steam turbines
2500+ Generators
1000+ BOP assets (HRSG's, etc.)

60,000+ operation alerts
9,000+ trip events
60+ dedicated engineers
400+ supporting domain experts
~300 Advanced Analytics

M&D Infrastructure



Challenge

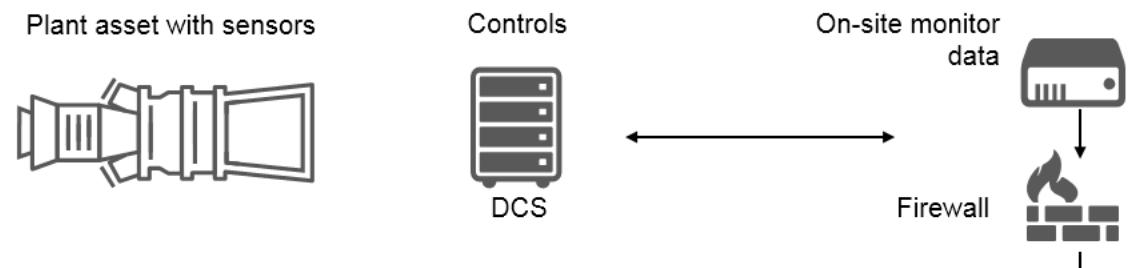
Real Time Identification of Power Plant Monitoring System Issues

- Dropouts of gas and steam turbine monitoring need to minimized
 - Identification of specific failure point not obvious from high level metrics
 - Monitoring performance of databases or logging onto servers very tedious
 - Often failure analysis was more speculative than conclusive
 - Frequency and duration of issues meant long hours and weekends attempting to resolve
 - Mis-diagnosis directed efforts and funding ineffectively

Splunk Solution Step 1 of 4

Data Acquisition of Asset Operation

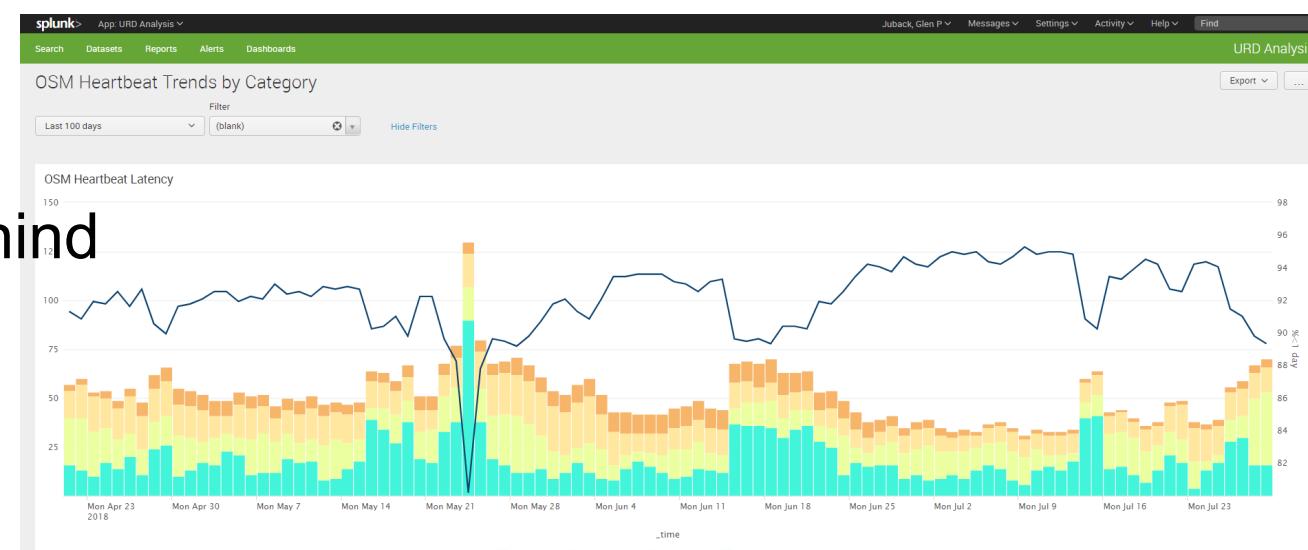
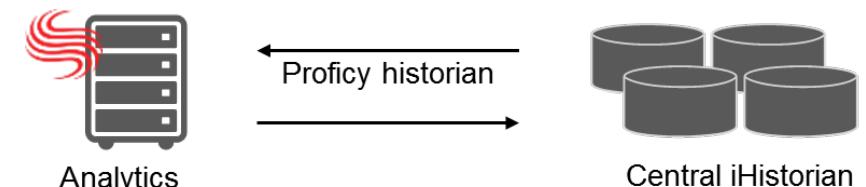
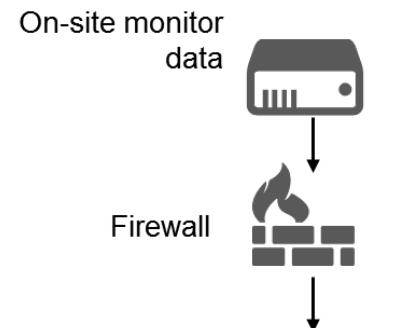
- ▶ Asset data is successfully being recorded at desired sample rates
 - ▶ Various logs identified containing indicators of various performance issues
 - ▶ Logs forwarded to Splunk server
 - ▶ Reports created identifying specific modifications to be made to collection process for optimization



Splunk Solution Step 2 of 4

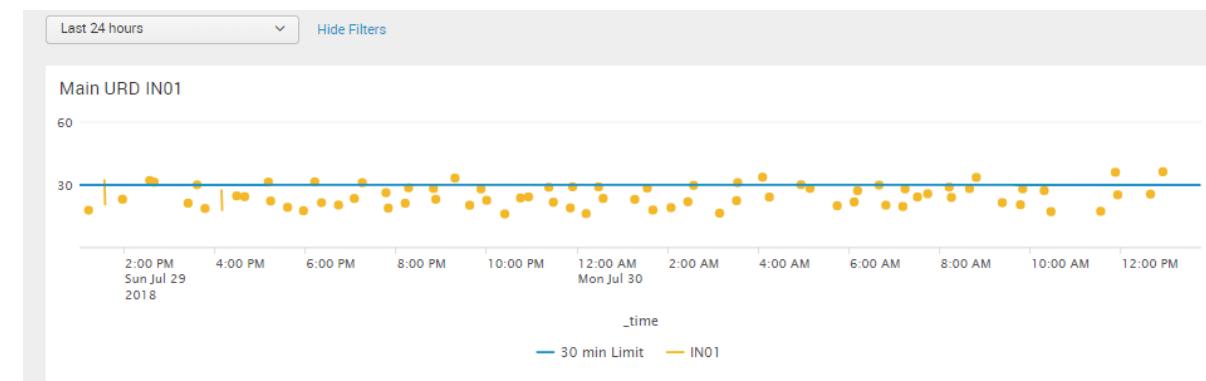
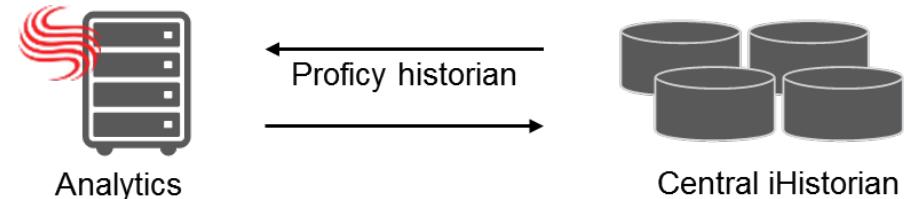
Data Transfer from OSM to Central Servers

- ▶ Data transfer needs to be as real-time as possible
- ▶ Analytic schedulers continually query the historians for latest timestamp and record to logs
- ▶ Data transfer latency calculated from logs
- ▶ Alerts generated for assets falling behind



Splunk Solution Step 3 of Historian Performance

- ▶ Query performance must meet the process requirement
 - Analytic schedulers continually query the historians for latest timestamp and record to logs
 - Query response times are then calculated/Plotted
 - Alerts generated for slow performance
 - Historian logs identify the resource causing poor query performance
 - ▶ High historian performance ensures analytics are running as near real-time as possible

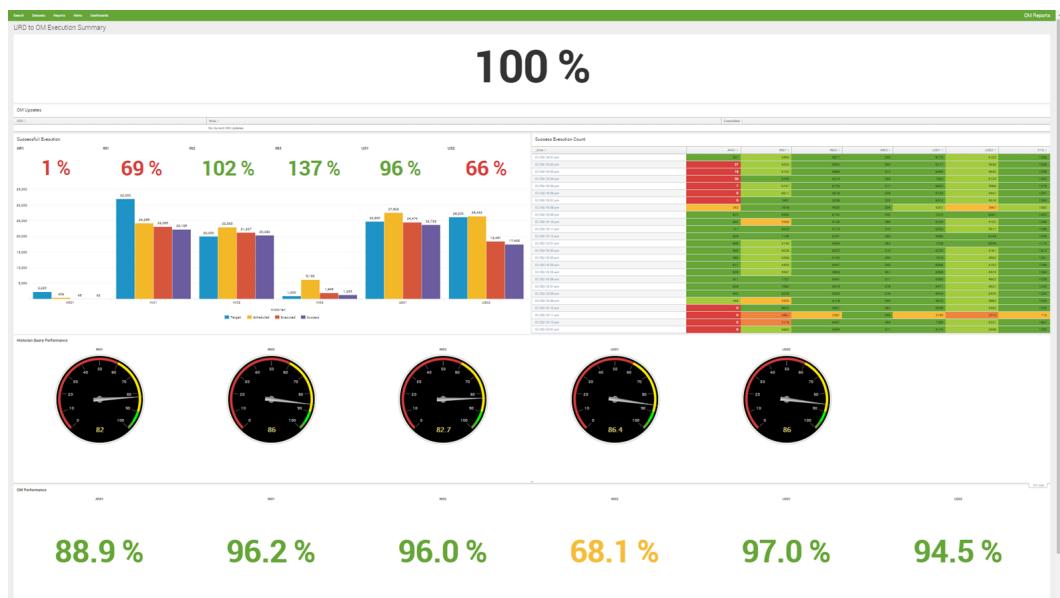
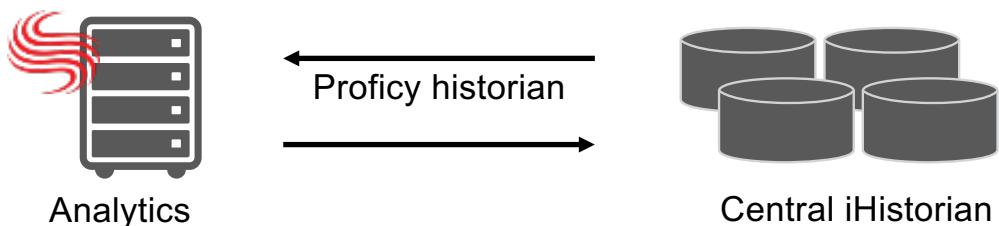


Splunk Solution Step 4 of 4

Analytics Execution

Analytics must execute on assets once data is available

- ▶ Analytic schedulers generate logs of queued assets
 - ▶ Analytic execution servers generate logs of attempted executions
 - ▶ Error messages generated for failed executions
 - ▶ Dashboard displays analytic execution performance vs. target
 - ▶ Pareto'd failure reasons drive issue resolution



Continual Development

- ▶ Inclusion of additional sources of information such as support cases, database integrations
- ▶ Refinement of root cause detection and alert generation
- ▶ Application on other environments

Thank You

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