

HPC Operations and Monitoring

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HPC Operations and Monitoring

Keeping LANL's HPC Datacenter Operational 24/7 by 365

BACKGROUND & MOTIVATION

The Laboratory's supercomputers play a vital role in our mission of stockpile stewardship and scientific discoveries.

- Our Operations Team is monitoring HPC systems 24/7 by 365.

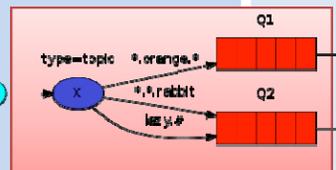


- Extensive modifications were made to customize the IT monitoring application Zenoss to fit our environment.

INNOVATION

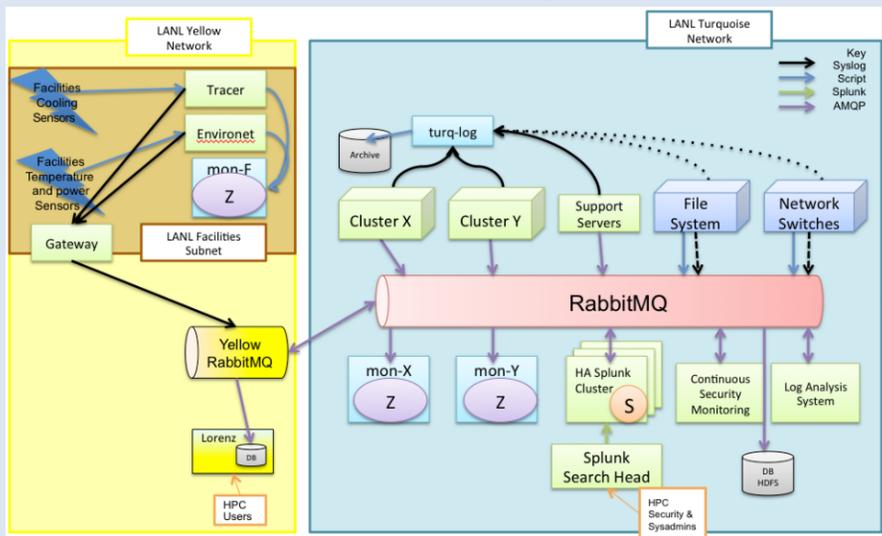
Monitoring infrastructure built around RabbitMQ lays the foundation for a full datacenter view and deeper analysis.

- RabbitMQ producer/consumer model provides one place to send log data while providing a plug and play architecture for any new analysis engine.
- Includes facilities data feed for full datacenter view.
- Provides infrastructure for event correlation and deeper log analysis.



DESCRIPTION

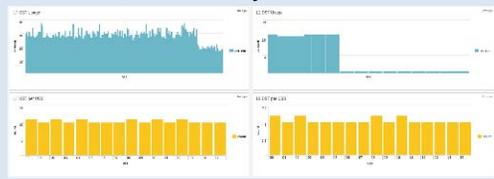
Our new monitoring infrastructure provides a single layer for data collection with the ability to filter and distribute data where it needs to go.



- RabbitMQ is an open source implementation of the Advanced Message Queuing Protocol (AMQP).

- The monitoring infrastructure currently processes 2 million message per day.
- Both the log analyzer, Splunk, and end user dashboard, Open Lorenz, are fed by RabbitMQ.

- Splunk is our main data analysis tool, providing easy to use dashboards.



TRL 9: Zenoss has been in production since '09 at LANL and provides the foundation for our cluster monitoring.

TRL 7: RabbitMQ infrastructure has been moving data in a production environment since January '15.

ANTICIPATED IMPACT

The new monitoring infrastructure paves the way for a full view of the datacenter.

- Provides event correlation within the complicated environment of the HPC systems, networks and file systems.
 - Allows for tuning and optimizing HPC resources.
 - Preemptively identifying and fixing issues.
- Adds facilities data along side system information giving a cohesive view of the full datacenter.

PATH FORWARD

Full Datacenter View

- After integrating all facilities and system data producers, a full view of the datacenter can be provided.

Trinity

- LANL's newest and largest Advanced Technology System setup June '15.
- Water cooled system drawing up to megawatts of power.
- Estimated monitoring data rate of 4 TB/day.

Potential End Users

- LANL's Operations Team, HPC Administrators, Support Personnel and End Users.

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