FY12 Tactical Plan for System Administration and Scientific Linux

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Relevant Strategic Plans: Scientific Computing Facilities

System Administration Goal

Provide a stable Linux based computing and storage environment for FermiLab experiments.

Executive Summary of Objectives for FY12

Maintenance and Compliance Drivers

1. Maintain Linux configuration baseline and Fermilab computer security policy compliance.
2. Proactively monitor systems for hardware and operating system related failures.
3. Provide incident and problem management services.
4. Provide computing hardware procurement services to customers.
5. Provide consulting and technical support to customers and peers.
6. Work closely with customers to understand current and future needs.

Upgrade and Enhancement Drivers

1. Increase computing capacity of GPCF
2. Continue to improve collection and reporting of operational metrics.
3. Develop SLAs for all system administration related services.

Strategic Drivers

1. Leverage virtualization to reduce the number of physical machines.
2. Implement improved system management tools and procedures to improve operational efficiency.

Activities and Work Definition

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System Administration/Short Term Projects

Activity type: New Project
Description: Linux system provisioning improvement. Evaluate and, if appropriate, deploy improved tools for performing unattended operating system installations.
Timescale: Start Dec 2011; Complete Mar 2012
Metrics: N/A

Activity type: New Project

Description: Virtualization technology evaluation. Review the latest open source virtualization management offerings.
Timescale: Start Jan 2012; Complete Feb 2012
Metrics: N/A

Service Activities

System Administration/RunII Online Systems Management
Activity type: Service
Description: Maintain computer systems, storage, and other hardware related to CDF and D0 Online operations.
Timescale: Continuous
Metrics: Number of systems supported and service desk tickets.

System Administration/Server Management
Activity type: Service
Description: Provision, maintain, and monitor hardware and operating system.
Timescale: Continuous
Metrics: Number of nodes, availability, server/sysadmin ratio

System Administration/Storage Management
Activity type: Service
Description: Provision, maintain, and monitor disk based storage hardware: direct attached RAID, NAS, and SAN.
Timescale: Continuous
Metrics: Volume of storage managed. Number of storage units.

System Administration/Batch System Management
Activity type: Service
Description: Maintain and support Torque batch system software. The scope of this activity currently only includes the D0 CAB batch system.
Timescale: Continuous
Metrics: Number of tickets, job slots

System Administration/Event and Incident Management
Activity type: Service
Description: Resolve interruptions, or potential interruptions, in service.
Timescale: Continuous
Metrics: Number of Service Desk tickets, availability, incidents reporting by monitoring software.

System Administration/Problem Management
Activity type: Service
Description: Perform incident root cause analysis with the goal of reducing service interruptions.

Timescale: Continuous
Metrics: Number of problems resolved.

System Administration/Operational Planning and Consulting Support

Activity type: Service
Description: Provide scientific computing design and maintenance related technical assistance to Fermilab experiments.
Timescale: Continuous Metrics: ---

System Administration/Procurement Support

Activity type: Service
Description: Execute budget for scientific computing hardware, services, and support contracts. Assist customers with annual budget and capacity planning.
Timescale: Continuous
Metrics: Total dollar amount equipment purchased

System Administration/Professional Development

Activity type: Service
Description: Misc activities dedicated to the improvement of employee technical skill and knowledge.
Timescale: Continuous
Metrics: Number of classes taken, certifications, talks given, papers written

System Administration/System Administration Management

Activity type: Service Description: Line management, change management, service level management
Timescale: Continuous
Metrics: Staff levels

Detailed Tactical Plan Objectives and Priorities

Maintenance and Compliance Drivers

Objectives:
1. Maintain all Linux systems in accordance with the Linux Configuration Baseline and Fermilab Computer Security policies, especially the CD OS patching policy.
2. Proactively monitor systems for significant events and failures. We continue to improve our monitoring tools with the objective of detecting and correcting issues before they impact users.
3. Closely related to monitoring is incident and problem management. When a customer experiences an interruption in service the highest priority is resolve the issue as quickly as possible. Equally important is problem management where the objective is to determine the root cause of incidents or provide a workaround.
4. Provide hardware procurement services to customers. This objective includes all activities related the hardware procurement and development life cycle including:

budget planning, specifying hardware, submitting requisitions, physical installation planning, acceptance testing, and more.

5. Consulting and technical support involves providing assistance to Fermilab users who may not want their systems to be centrally managed. This also includes working with other Computing Sector departments to provide recommendations on system management tools and techniques. In same cases we will help users bootstrap a manageable computing environment by providing instruction on how to deploy specific system management tools and hardware.

6. It's all about the customers. We feel that it's important to establish and maintain a strong working relationship with our user base. With regular, effective communication we are better equipped to provide the type of computing environment needed by Fermilab experiments and users.

Assumptions and Risks:

1. Inadequate manpower to provide quality services to the Fermilab experiments. Insufficient effort is the universal and most obvious risk to IT operations.

2. Smaller budgets potentially mean that hardware may not be refreshed at regular intervals. This in turn means that hardware is more prone to failures and more effort is required to maintain systems.

3. Low morale, decreased productivity, and an increase in resignations due to various things affecting the laboratory.

4. Risk of security incidents if systems are not patched per policy.

5. Reduced availability if machines are not monitored and incident/problem management services are not properly provided.

6. As stated at the beginning of this document the goal of system administration is provide a stable computing environment. To achieve this goal we rely on stable computing facilities. Without reliable data centers, and adequate facilities related capacity planning, a stable computing environment cannot exist.

Upgrade and Enhancement Drivers

Objectives:

1. Upgrade the computing capacity of GPCF. FY11 was the first year of GPCF in production. While there were some early issues with performance the facility is now being heavily used by the IF experiments and others. In FY12 adding additional "interactive" nodes, improving backend storage and more, will increase the capacity of GPCF. Details can be found in CD-doc-4384-v1.

   Additional GPCF hardware upgrades, purchased with FY12 funds, will be performed to further expand computing capacity with the primary aim of consolidating legacy RunII systems.

2. Collection and reporting of key metrics. With the deployment of tools such as Ganglia and Graphite we continue on our quest to "measure everything". There are valuable operational insights to be gained by collecting metrics on everything from power consumption to the number of SLF4 systems deployed throughout the lab. Our improved metric collection tools will allow us to collect numbers quickly and easily.

3. Build an economic model for virtual computing. Understanding the cost associated with virtualization will help us to make informed decisions when deciding which technologies to pursue.

1. The largest risk is unforeseen technical hurdles related to GPCF software and hardware upgrades.

Strategic Drivers

Objectives:
1. Virtualization. Continue to implement systems in accordance with the Computing Sector strategy of leveraging virtualization to consolidate servers and increase reliability.
2. Continue to place a strong emphasis on improving system management tools and procedures. In FY11 we overhauled the way we manage system configurations. This year we want to focus on improving the way we provision systems. Efficient system provisioning is a challenging problem because our computing environment is incredibly complex, spanning many experiments, physical locations, and network segments.

Assumptions and Risks:
1. We must be careful not to fall into the trap of virtualizing just for the sake of virtualizing. There must be a strong business case for virtualizing a system, e.g. the cost saving realized from consolidating many physical systems into a handful of virtual systems.
2. System provisioning is tricky because our computing environment is incredibly complex spanning many experiments, physical locations, and network segments.