System Administration for the Enterprise

W.L. Garner and L.J. Hawk

North American Performance Group, Inc.

Introduction

- William L. Garner
  - Over 15 Years as SysAdmin
  - Large shops, Large Environments
  - Performance and Capacity Planning
  - Security Management & Incident Response
- Landi J. Hawk
  - 20 Years IT
  - Disaster Recovery Planning
  - Data Architecture & Data Warehousing
  - Application Implementations

Agenda

- Background
- What is Enterprise Administration
- Principles of Good Enterprise Administration
- Architecture of Enterprise Administration
- Practical Implementation
- Closing

Background

- Unix has taken the Data Center
- Unix has matured as an Operating System
- Administration at a server level
- Disk Arrays have been administered at a server level
- Management is looking for reductions in costs

What is Enterprise Administration

Enterprise System Administration is the activity necessary to provide and maintain IT services for the Enterprise.

What is Good Enterprise Administration

- It is efficient
- It is organized
- It is standardized
- It is procedural

What is Good Enterprise Administration

- Good Enterprise Systems Administration
  - produces consistently predictable, stable, environments
  - produces environments requiring lower levels of effort to maintain
  - is high on the Capability Maturity Model

Capability Maturity Model

- Developed by The Software Engineering Institute at Carnegie-Mellon University
- Describes five stages of organizational evolution or maturity
- Provides a model for process maturity

Software Engineering Institute's Capability Maturity Model

- Level 1 - Initial
- Level 2 - Repeatable
- Level 3 - Defined
- Level 4 - Managed
- Level 5 - Optimizing

Capability Maturity Model

Initial Level

- Not Process Oriented
- Success dependent on staff talent or luck
- Ad-hoc manner of work
- Hard to achieve improvement
- Heroes and Headaches
- 70% of IT organizations

Capability Maturity Model

Repeatable

- Managing projects using repeatable processes
- Processes driven environment
- Measure success of processes
- Make improvements

Capability Maturity Model
Defined

- Institutionalize processes
- Entire IT organization integrated into the process improvement process
- Focus on full spectrum of IT activities

Capability Maturity Model

Managed

- Quantitative Measures become important in assessing areas of improvement
- Overall quality is measured

Capability Maturity Model

Optimizing

- Highest Level of maturity
- Entire organization is focused on continuous process improvement

Mark Paulk
SEI/Carnegie Mellon University

Level	Focus	Key Process Area
Optimizing	Continual Process Improvement	Defect Prevention Technology Change Management Process Change Management
Managed	Product and Process Quality	Quantitative Process Management Quality Management
Defined	Engineering processes and organizational support	Organizational Process Focus Organizational Process Definition Training Program Integrated Management Inter-group Co-ordination
Repeatable	Project Management Processes	Requirements Management Project Planning/Tracking Configuration Management
Initial	Competent People and heroics	

Benefits of using the Capability Maturity Model

- Benefits come over time
- Reduced re-work, fewer faults, enhanced predictability, increased user satisfaction, enhanced performance reputation, increase credibility
- Greater control and better ability to plan
- Increased efficiency, accountability and responsiveness

More Information on Capability Maturity Model

- Software Engineering Institute at Carnegie-Mellon University
- www.sei.cmu.edu/cmm/cmm.html

Principles of Good Enterprise Administration

- Standardize
- Simplify
- Automate
- Segregate
- Consolidate
- Regulate

Standardize

- ServiceGuard like approach to SysAdmin
- Naming Conventions
- LVM Structures
- DBMS
- Kernel configuration

Benefits of Standardization

- Establishes the ‘rules of the road’
- Makes your environment understandable
- Empowers decision making
- Makes it easier to be right than it is to be wrong

Simplify

- Apply standards universally
- Use Authority Delegation tool
- Maintain online change log
- Use scripts
- Practice ‘Application Containment’

Application Containment

- Building applications on servers in a ways that simplify the process of relocation
- Essentially follow ServiceGuard Standards for LVM
- Benefits
  - Gives you options
  - Simplifies Disaster Recovery and Backup/Recovery Planning
  - Simplifies upgrades

Benefits of Simplification

- Simple things work
- Simple things can be taught
- Complexity is built on combinations of fundamentally sound simple ‘things’
- Simple things can be understood, internalized

Automate

- Deploy and use a scheduling tool
- Develop scripts to do ‘housekeeping’
- Take advantage of run-level functionality

Benefits of Automation

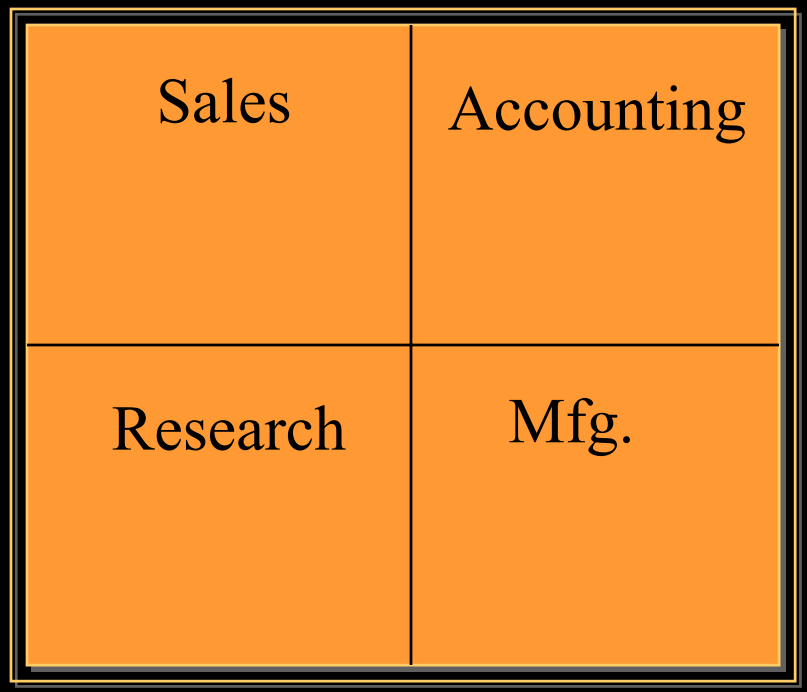
- Direct workload relief
- Reliability
- Consistency

Segregate

- Logically organize applications by business unit
- Within business units, segregate applications by operational function

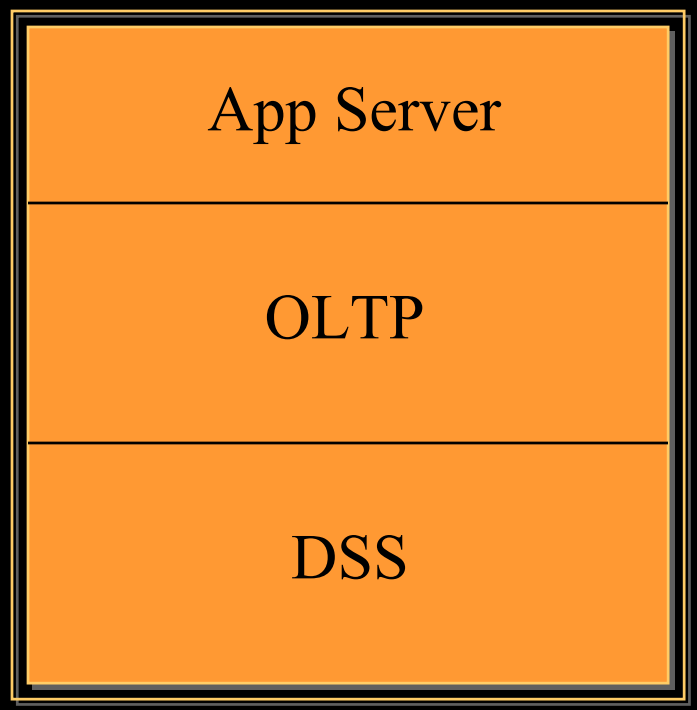
Segregate

- Logically organize applications by business function.



Segregate

- Segregate by operational category



Benefits of Segregation

- Opportunity to synchronize IT operations with Business cycles
- Insulates servers and applications
- Enable simplified approach to backup/recovery
- Enable simplified approach to Disaster Recovery

Benefits of Segregation

- Optimum hardware configuration based on role
- Optimum O/S configuration based on role
- Metrics tuned for role

Consolidate

- More applications on fewer ‘bigger’ servers
- Business unit separation makes for a more manageable environment
- Separation by operational role makes for higher performing environment

Benefits of Consolidation

- Fewer Servers to maintain
- Easier to maintain 1 big server than to maintain 25 small servers
- Easier to manage points of failure

Benefits of Consolidation

- At the Business unit level, separation makes for a more manageable environment
  - Simplified SLA
  - Insulation from other business unit disruptions

Regulate

- Establish thresholds and use them
- Proactive system capacity and performance monitoring
- Enforce standards
- Manage implementations

Architecture of Enterprise Administration

- It's not a 24x7 world
- It is a 360 Degree world
- The computer is no longer a server
- The 'computer' is the combination of every server, every disk array, every network device and every cable in the data center

Architecture of Enterprise Administration

- Application Containment becomes essential
- Mobility and high availability
- Periodic consolidation and re-alignment

Practical Implementation

- Design your environment
- Deploy all new servers according to your design
- Deploy all new applications according to new standards
- Establish a schedule to retrofit standards to old applications

Practical Implementation

- Business justification for retrofit
  - More effective use of assets
  - Fewer servers mean fewer support contracts
  - Reduced internal support effort

Closing

- Enterprise Administration is an exercise in engineering
- Always work from business requirements