A Brief History

❖ Mainframes - System support team of 30+
❖ Minis - Smaller (<10) support team
❖ PCs - One administrator per machine!
❖ UNIX - 1:1 to 1:150?
The Role of System Administrator

❖ The Troubleshooter
❖ The Walking Encyclopaedia
❖ The Tool Smith
❖ The Researcher and Student
❖ The Technical Writer
❖ The Strategist and Tactician
❖ Doctor and Counsellor

The Workplace Problems

❖ Lack of management understanding
❖ Lack of reporting standards
❖ Lack of workplace standards
❖ Lack of time for research and problem prevention
❖ Sysadmin is a 24-hour concern
❖ Exactly where is the boundary?
Problem: Management

❖ What is it that we do?
❖ How much effort is required to do it well?
❖ What’s so difficult about running a few systems anyway?
❖ We’re invisible when everything is ok
  – First against the wall when it hits the fan.

Problem: Programmers

❖ Programs are generally written as though they will be the only thing present in the target environment.
❖ This is rarely true
  – Even when it is, the system is continually changing
❖ SysAdmin is the point of integration
  – Tens of applications
  – Hundreds of users
  – Thousands of commands
Problem: Availability

❖ Whatever we’re doing, we stop the moment the system breaks
  – There is an inherently reactive workload element which overrides other aspects of the role
❖ That doesn’t mean we get funding or permission to prevent things breaking

Problem: Standards

❖ The existing standards efforts have all either attempted to grab “low hanging fruit” or just not understood what was needed
  – POSIX.1: Removable Media
  – POSIX.1h: Services for Reliable, Available and Serviceable Systems (SRASS)
  – X/Open Distributed Systems Management
❖ They’ve failed, for the most part
  – They lack direction and context
  – They lack understanding of the problem space
The Nature of the Job

❖ Principle Investigator - for *any* problem
❖ Innate Intricacy of Environments
❖ Highly Individualised Environments
❖ Systems Undergoing Continual Change
❖ Continuing New Technology Introductions

The Programmer’s Stone

❖ Packers and Mappers
  – Packers are the people who pack things into neat little boxes and execute procedures learned by rote
  – Mappers are the people who seek to understand the underlying concepts and map those concepts to the problem space
❖ There is a significant push to attempt to address the shortage of sysadmins by reducing the role to procedures for Packers
  – This is inherently flawed
The SysAdmin and TQM

- TQM is what we know as “Root Cause Analysis”
  - TQM is a SysAdmin's *modus operandi*
- Fighting the god of entropy!
  - Such a battle mandates a systemic view
  - We must seek to solve the class of problems
- Always more problems
  - We’ll never be out of a job

Where Nature Meets Engineering

- An Organic System Grows
  - We fight entropy - the advance of decay
  - We attempt to retro-fit “order”
- An Engineered System is Built
  - We implement new systems
  - We replace old systems (technology turnover)
- We can Choose the Balance
The Hidden Cost

❖ Too many sysadmins re-invent each site in their own image
❖ Huge cost of staff turnover
❖ Huge cost of lost productivity
❖ Different ≠ Bad
❖ Time for the ego-less sysadmin?

Technology Turnover

❖ We are our own worst enemies
❖ It continues to become cheaper to replace technology than to maintain it properly
   – The cost of implementing fresh technology is far cheaper than the cost of maintaining entropy-laden legacy environments.
❖ We never actually bother to solve the real problems - just mutate them a bit!
We need to grow up!

How does a Profession Develop?
- Go it alone
- Discovery of peers (networking)
- Formation of local support groups
- Conferences and newsletters
- Standardisation of practices
- Introspection and Formalisation

Standardisation of Practices

Why bother
- People change jobs every 18-36 months
- Mappers need shared mental models
  - This is how we exchange ideas
- Accelerated Development of the Industry
Benefits of a Common Understanding

❖ Organisational Maturity
  – Independent benchmark for evaluation
  – Ability to plan proactive improvement projects
❖ Consulting Consistency
❖ Personal Development
  – Certification
  – Degree level courses

So How do we Get There?

❖ In order to progress towards the provision of mature IT services, we must first understand the nature of that problem space.
  – We need to break the problem down into bite sized chunks, so we can plan how to address shortfalls.
  – In order to decide on what the pieces are, we must understand the nature of systems administration.
What’s Already Out There?

- ISACA COBIT
  - High-Level Process-Oriented Controls
- SEI CMM
  - Organisational Maturity for Software Development
- PM-BOK
  - Responsibilities based Controls

Professional Development

Key Areas of Responsibility

- Tasks
- Skills
- Knowledge
Key Areas of Responsibility

❖ KARs provide a view which is independent of platform, vendor, environment and skill level
  – This allows us to develop meaningful metrics for measuring and planning improvement works
❖ The SAGE Body of Knowledge, SA-CMM/ Taxonomy of Best Practices project is seeking to define Systems Administration and develop a Capability Maturity Model for the field
  – This is a work in progress

Systems Management Disciplines

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<th>Protect</th>
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Service Management
**Change Management**

- Change Management Process
  - Flexibility, QA, Risk Mgmt, User Acceptance
- Production Control
  - Responsibility, CCB, Cause and Effect, Impact
  - Matrix, Notification
- Certification Process
- Change Support Automation
- Software Change Management Plan

**Problem Management**

- Help Desk
- Trouble-Ticketing System
- Workflow Management
- Problem Resolution and Causal Analysis
- Service Management
- Event Management
Facilities Management

- Data Centre
  - Equipment labelling, environmental controls, physical security, computer room environment, planning
- Equipment Management
  - Maintenance contracts, console management
- System Documentation
  - Physical maps, logical maps, key support docs, document management, access and use

Network Management

- Network Strategy
- Network Management
- Network Operations
- Network Gateways
- Network Security
Server Management

- Host Management Standards
- Host Installation and Configuration Standards
- Centralised Configuration Management
- Centralised Host Administration
- Automated Housekeeping
- Automated Administration
- Information Flow Management
- Continuing Review of Practices

Software Management

- Software Distribution and Management
- Production Acceptance Process
- Application and Service Monitoring
- Application Distribution and Synchronisation
- License Management
Data Management

- Data Management Policy
- Backup and Restore
- Storage Management
- Data Availability
- Database Management

Backup and Restore

- Media Selection
- Scope and Schedule
- Coverage Verification
- Media Verification
- Volume Management
- Failure Management
- Off-site Backups
- Service Guarantees
The SA-BOK Project

- The Goal:
  - To define a reference framework defining systems administration
  - To capture “Industry Best Practices”
  - To identify the core skills, knowledge and disciplines required, such that people can be more effectively trained in the field

Project Interlocks

- SAGE is presently undertaking several projects which all dove-tail into each other:
  - The Taxonomy Project
  - The Certification Project
  - The Education Project
  - The Updated Job Descriptions Booklet

- All of these share a need for a common understanding of the role
Phase 1 - SA-BOK

- Define the Domains and Sub-Domains of Responsibility
- Define the Concepts, Knowledge and Tasks for each Domain
- Benefits:
  - Shared Mental Models
  - Improved Training Programs
  - Definition of “System Administration” Skills
  - Dictionary of Systems Administration

Phase 2 - SA-CMM

- Define levels of maturity with respect to each of the Domains
  - Using objective criteria, similar to CMM
- Define evaluation criteria for each Domain
- Benefits:
  - Commence industry benchmark program
  - Provide impetus for organisational recognition
  - Promote the proactive improvement of practices
Phase 3 - SA-IBP

- Capture Industry Best Practice into Web site
  - Lots of contributors
  - Lots of beneficiaries
- Benefits:
  - Learn from your peers

THE END

- Taxonomy BOF - Thursday @ 7pm
- Questions?
- Comments?