“Standard Deviations” of the “Average” System Administrator

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Goals of this talk

• Challenge “mores” of the profession.
• Make established sysadmins angry.
• Make beginning sysadmins happier.
• Ask some tough questions.
• Take a controversial stance on how to improve the practice and profession.
In the last episode,

• The Microsoft Certified Engineer (MSCE) exams:
  – Do not measure system administration capability.
  – Do not accept some “correct” answers.
  – Were not trusted by potential employers in the audience.
In this episode,

• The MSCE program is **fantastic!**
  – …from a certain point of view…
  – …and Darth Vader isn’t Luke’s father…
Some definitions

• **Conformity**: attempting to do things the same way as others (an ad-hoc **process**).

• **Consistency**: result of doing things the same way (an ad-hoc **result**).

• **Standards**: specific goals for conformity (a structured **result**).

• **Compliance**: obeying standards (a structured **process**).
We are a culture of non-conformists

• I can make my systems work better than that.
• I value being creative and trying new things.
• It’s more efficient for me to manage a network molded in my own image.
• I don’t care if others don’t understand it.
• I feel more secure if others cannot do my job.
• I can’t afford to conform and also fight fires.
• All of these are value judgments.
Cost of non-conformity

How many of you:

• can delegate any job to another administrator?

• can quit and be replaced by an outsider in a reasonable time?

• have documentation that describes and explains your choices?

Non-conformity costs money!
Uses of System Administration Standards

• Reduce need for documentation.
• Reinforce best practices to management.
• Exploit social footprint of software.
• Promote interchangeability of staff.
• Reduce learning curve for new staff.
Key to using SA standards

• Adopt a **global view** and **risk model**.
• Analyze **lifecycle cost** of decisions.
• Consider the health of the **profession**.
MSCE Revisited

• What’s the value of memorizing “the right way” to do something?
• Answer: if everyone does it that way, you know how it was done.
• The MSCE approach defines a de-facto standard.
• So if you assume management of a system previously managed by an MSCE-certified admin, there’s a good chance you’ll understand what was done!
• Makes no sense for the individual.
• Makes a lot of sense for the organization.
Analogous to the MSCE: National Electrical Code

• There are many ways an electrician could wire a house.
• But there are only a small number of approved ways.
• These are listed in the National Electrical Code (NEC).
• (local codes provide amendments)
What the NEC does

• Provides documentation of best practices.
• Concentrates on externally observable and verifiable results of practice.
• Supports a guild system that trains people in the code.
• Defines what it means to certify results.
• Compliance is required by law.
Non-technical tenets of the NEC

- Wiring is **forever**.
- If you **touch** it, you make it **comply**.
- Standards are:
  - unambiguous,
  - externally verifiable,
  - and based upon a **shared risk model**.
Learning From Electricians

• Can test **knowledge**, but not **skills**.
• Must **observe results** of skills in the **work environment**.
• This requires **apprenticeship** and **inspection**.
• Goal of inspection is checking for **compliance** with **standards**.
A good system administration standard:

• Codifies and documents **best practices**.
• Utilizes **global knowledge** of the effects of decisions.
• **Informs management** about **vital parts of the job** that they might otherwise ignore.
• Reduces the need for **local documentation** of site practices.
• Supports **interchangeability** of staff and **site maturity**.
• Provides a meaningful **metric** with which **sites** can be checked for **compliance**.
Low-hanging fruit

• Many choices we make as system administrators have **nothing to do with behavior**.

• I have called these “**incidental**” choices.

• Schwartzberg and Couch (2004): most of a web server’s configuration is **incidental**.

• Examples: names of servers, mount points for file servers, locations of home directories, locations of web content, etc.
High-hanging fruit

• Other standards concern **quality of practice**.
  – Electrician Example: use electrical tape to prevent shorts.
  – Sysadmin Example: monitor behavior of services to prevent undetected outages.

• Purpose of these standards: **inform management**.
Downsides of Standards

• Can give hackers more information about site weaknesses.
• Can make networks more vulnerable by enforcing a systems monoculture.
• Can mandate lower-performance solutions.
Discussion Questions

• Do you think your organization has standards for system administration?
• Do advantages outweigh disadvantages in adopting standards?
• Should we foster health of the individual over health of the profession?
See also

• My ;login: articles in August and October 2008 issues.
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