Auditable Security Controls Of Best In Class Security and IT Operations Organizations:

What Do They Do And How Do They Do It?

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Surprising Executive Allegations

- We have heard some very surprising things in the 30 Practitioner Roundtables we've hosted in the last four years
  - Control and security are not possible
  - Change management is bureaucratic, slows work down, decreases productivity, and is overly burdensome
  - My business demands are so high in my environment is so high, that the management of change is not possible
  - I can sustainably achieve my security objectives without repeatable, verifiable IT operational processes
- Really? Why do they believe these things?
  - Is there anything we can do to change their belief systems?

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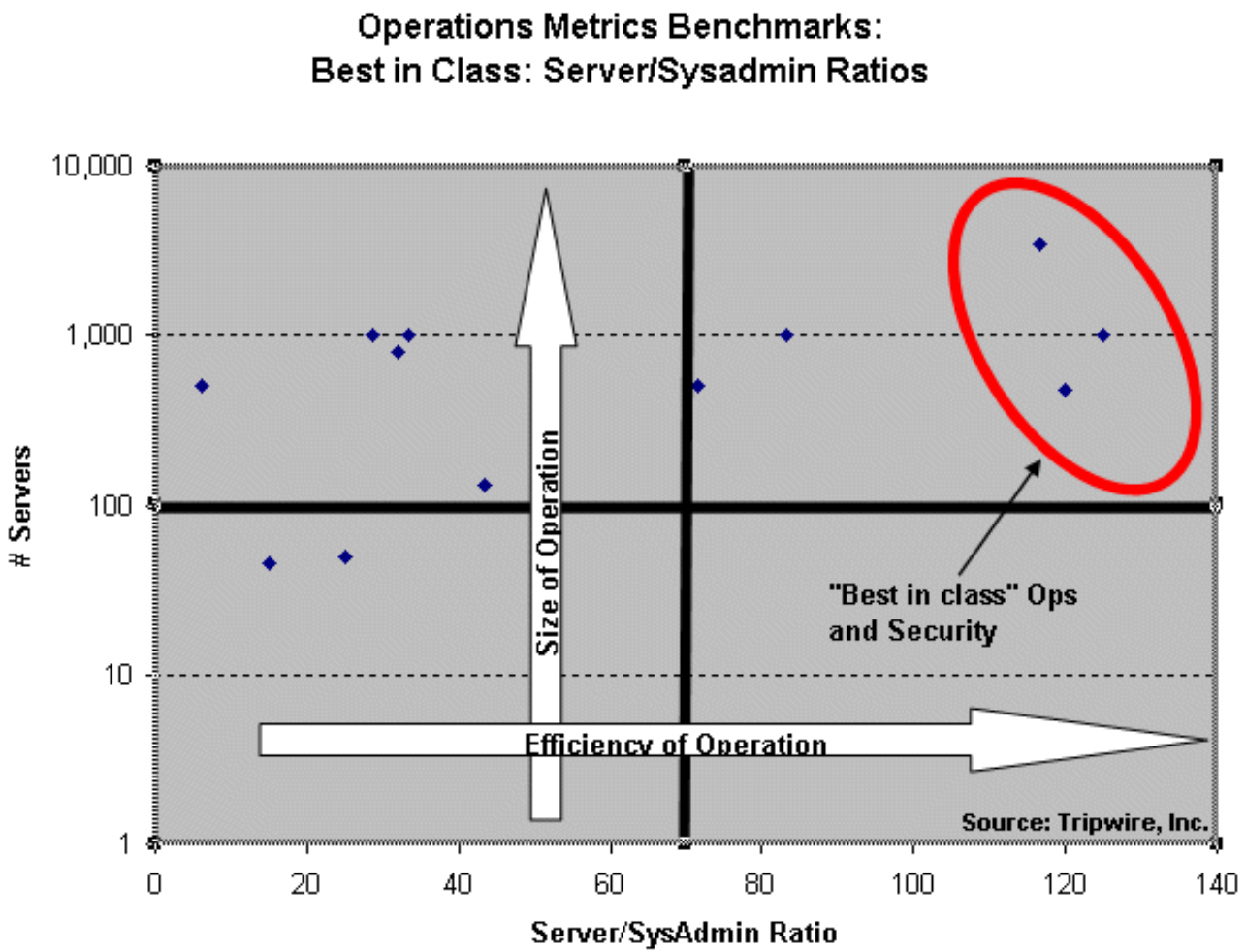
Best In Class Ops and Security



Best in class Ops and Security organizations have:

- Highest server/sysadmin ratios
- Lowest Mean Time To Repair (MTTR)
- Highest Mean Time Between Failures (MTBF)
- Earliest integration of Security into Ops lifecycle

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Talking Points

- What is common among the high-performing IT organizations?
  - What are their beliefs?
  - Why do they hold these beliefs?
  - What behaviors and characteristics do they exhibit?
- What are the key differences between the high- and low-performing IT organizations?
  - Patch management, management scorecards, IT outsourcing
- How do organizations transform from a low- to high-performing IT organization?
  - Visible Ops methodology
  - Process area metrics
- The VEESC Benchmarking Study (Valuing the Effective, Efficiency and Security of IT Controls)
  - The hypothesis and methodology
  - Our call to action!

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History of IT Operations and Security Research

- Began studying high-performing IT operations and security organizations in 2000, to understand their processes and implementations. These organizations exhibited:
  - Highest availability
  - Shortest MTTR
  - Lowest IT cost profiles
  - Least amount of time spent on unplanned work
  - Best integration of security into operational processes
- Now working with IT Process Institute, CMU's Software Engineering Institute and SANS to understand how high performing organizations work manage IT to achieve business objectives
  - Functional roles span: IT Operations, Audit, Security, Management, Governance, etc…
  - 04/2003: Co-chaired SANS *Auditable Security Controls That Work*
  - 10/2003: Co-Chaired SEI *Best in Class Security and Operations Roundtable*
  - 10/2004 (in planning): Co-Chairing SANS *Defining IT Operational Training Curriculum*

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Common Traits Of The Highest Performers

- Culture of change management
  - Integration of IT operations and security processes via problem management and change management processes
  - Processes that serve both organizational needs, as well as business objectives
  - Highest rate of effective change (approved changes, change success rate)
- Culture of causality
  - Highest service levels (MTTR, MTBF)
  - Highest first fix rate (unneeded rework)
- Culture of compliance and continual reduction of operational variance
  - Production configurations
  - Highest level of pre-production staffing
  - Effective pre-production controls
  - Effective pairing of preventive and detective controls

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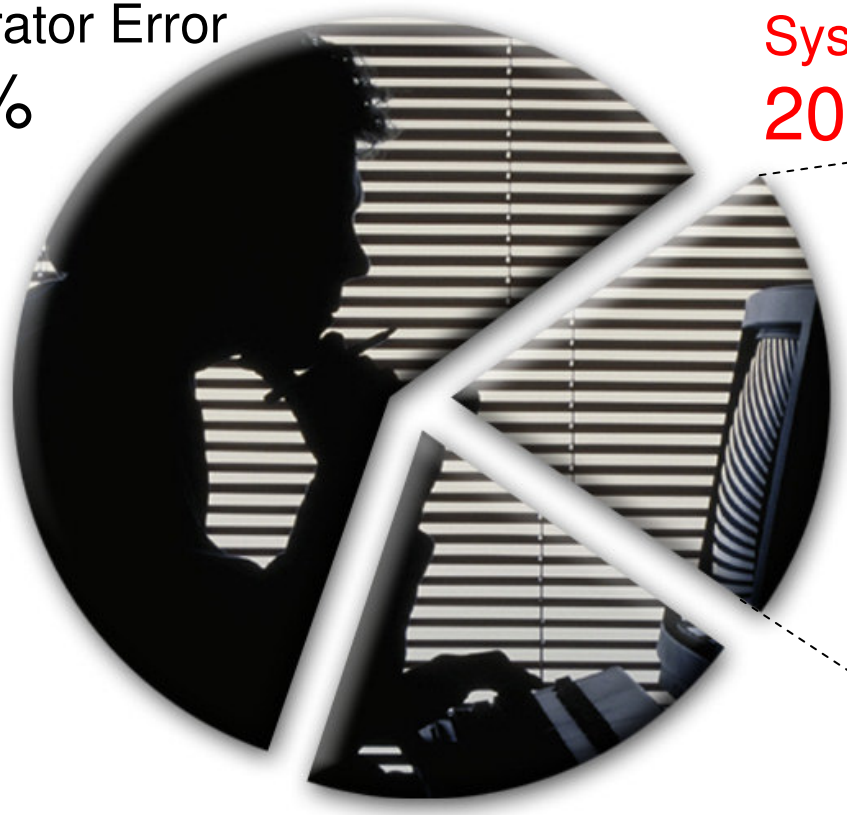
Causal Factors of IT Downtime



Operator Error
60%

System Outages
20%

Security Related
5%

Non-Security Related
15%

Application Failure
20%

Source: IDC, 2004

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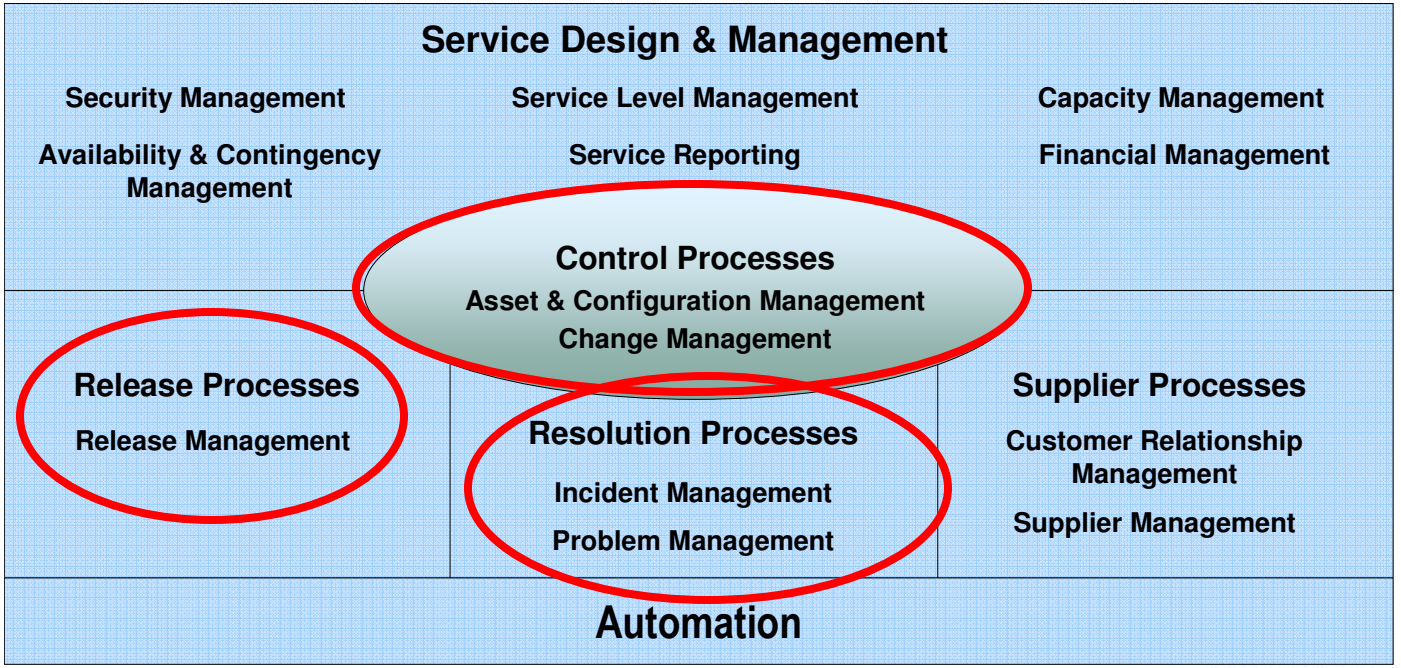
Common Process Areas Of High Performers

- All the high-performers had self-derived the same way of working
  - Culture of change management
  - Culture of causality
  - Culture of compliance and desire to continually reduce variance



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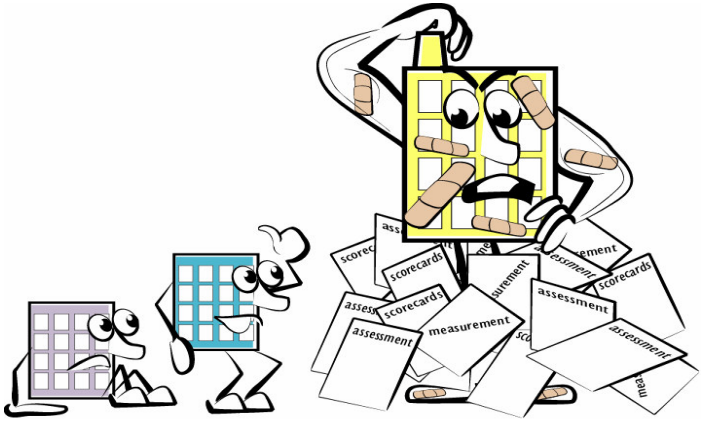
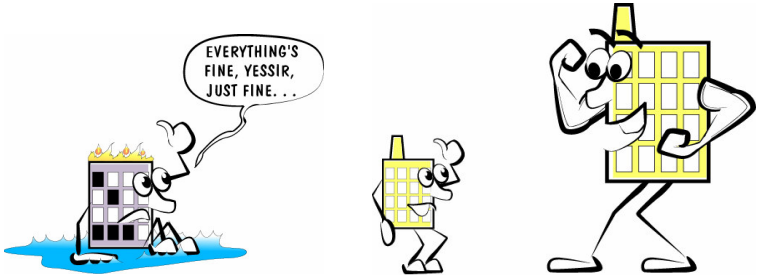
Areas of Pain Identified by High Performing Organizations

- Volume of patches and patch management
  - Low performing: Adhoc, chaotic, urgent, disruptive; increase in unplanned work
  - High performing: Planned, predictable, just another change --> higher change success rate
- Proliferation of “scorecards” and other measurement, assessment instruments
  - Low Performing: Look to external sources, authorities; adopt scorecard du jour
  - High Performing: Have defined their own performance characteristics; can demonstrate traceability to other instruments
- Managing outsourced IT services
  - Transfer risk; out of sight; then unable to control
  - Manage like any other business unit or project; understand unique challenges; develop more bullet proof service level agreement





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Common Root Causes - 1

- The absence of explicit articulation of current state and desired state obscures amount of pain
  - "It doesn't hurt enough yet; don't know that there is an alternative."
- A culturally embedded belief that control is not possible
  - Abdication of responsibility – "throw up my hands"
- A system that rewards and reinforces personal heroics, instead of repeatable, predictable discipline
  - "What is overlooked is that if one person can save the entire boat, one person can probably sink it, too. "

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Common Root Causes - 2

- The argument that IT ops and security are different (than other business investments or projects)
  - A common belief is that ongoing security can exist outside the scope of IT operations.
- The continual desire for a technical solution
  - Technology is easier to justify and implement than people and process improvements

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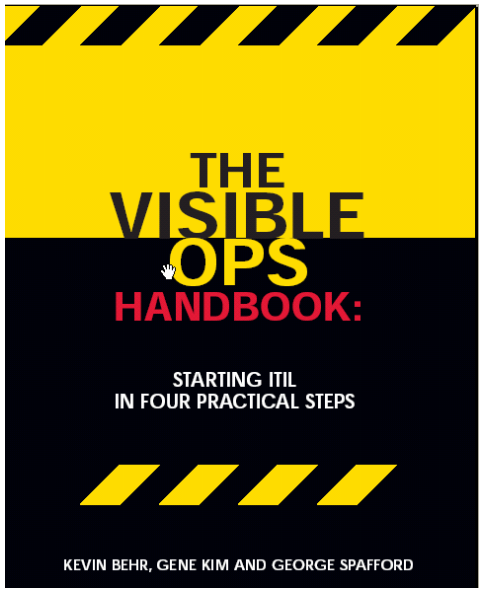
Visible Ops: Four Steps To Build An Effective Change Management Process

- Each of the four Visible Ops steps is:
  - A finite project: not a ISO 9001 initiative or a vague 5-year vision
  - Catalytic: returns more resources to the organization than it consumes, fueling the next steps
  - Sustaining: process stays in place, even when the initial force behind it disappears
  - Auditable: supports factual reporting and attestation to process adherence and consistency
  - Ordered: must be done in the specified order to achieve the above
- Model based on five years studying high-performing IT Ops and Security organizations
- Visible Ops has been donated to the ITPI



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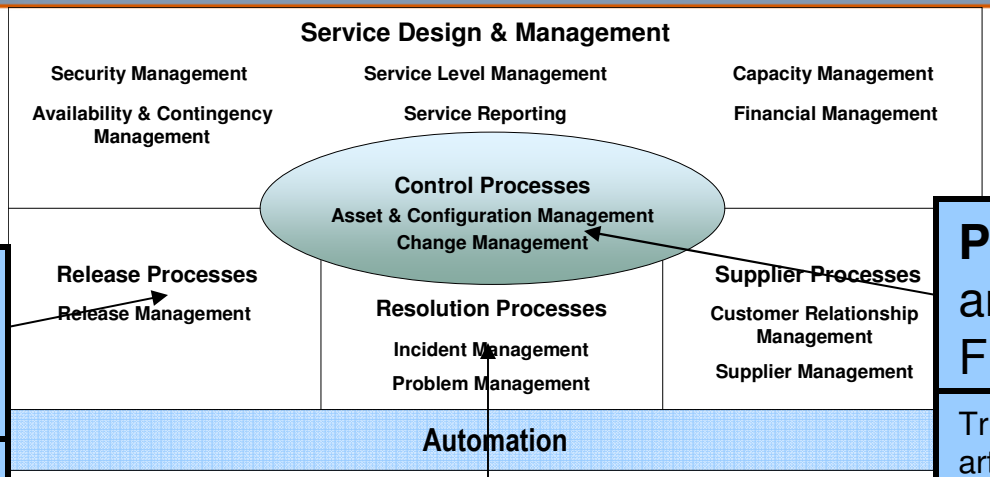
Visible Ops: Four Steps To Build An Effective Change Management Process



Phase 3: Establish Repeatable Build Library

Tripwire captures known good state in preproduction.

Tripwire captures production changes that need to be baked into the build.

Phase 2: Catch and Release, Find Fragile Artifacts

Tripwire protects fragile artifacts.

Tripwire enforces change freeze and prevents configuration drift.

Phase 4: Continually improve

Tripwire detects change, which all process areas hinge upon.

Phase 1: Electrify Fence, Modify First Response

Tripwire enforces the change process.

Tripwire rules out change as early as possible in the repair cycle.

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Which Metric Do You Want To Improve?

- Release
  - Time to provision known good build
  - # turns to a known good build
  - Shelf life of build
  - % of systems that match known good build
  - % of builds that have security sign-off
  - # of fast-tracked builds
  - Ratio of release engineers to sysadmins
- Controls
  - **# of changes authorized per week**
  - # of actual changes made per week
  - **Change success rate**
  - # of emergency changes
  - # of service-affecting outages
  - # of “special” changes
  - # of “business as usual” changes
  - Change management overhead
  - Configuration variance
- Resolution
  - **MTTR, MTBF**
  - **% of time spent on unplanned work**

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Thought Experiment

- What is more desirable?
  - 1000 servers, configured identically, but configured insecurely
  - 1000 servers, configured randomly, but 20% configured in a secure manner

Most high performing organizations would choose the first. Why?

Ability to systematically change all configurations, ability to defeat entropy, ability to maintain any *desired state…*

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ITPI Background

- The Information Technology Process Initiative (ITPI), a not for profit organization, is engaged in three principle areas of activity, Research, Benchmarking and the Development of prescriptive guidance for practitioners and business executives.
- The ITPI has collaboration agreements in place with research organizations such as The University of Oregon Decision Sciences program and The Software Engineering Institute at Carnegie Mellon University.
- We are currently working to create prescriptive guidance that solves the common objectives of IT Security, Corporate Governance, Audit and Operations.
- Through Research, Development and Benchmarking the ITPI creates powerful measurement tools, prescriptive adoption methods and control metrics to facilitate management by fact.

http://www.itpi.org

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Hypotheses

- That there is a low cost of quality for attaining high-performing and best-in-class characteristics
  - For instance, to achieve high availability, you can achieve by repeatable processes or controls, or by throwing enough resources at the problem (ad hoc)
  - In the two cases, how much does it cost to increase availability by 1%?
  - Show that processes allow linear improvement, while ad hoc creates exponential cost
- That the thinking processes of high-performance IT operations management can be quantitatively and qualitatively correlated

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Hypotheses ***

- That within the five BS 15000 process areas, the release, controls and resolution are dominant
  - The three process areas create leading indicators (exogenous), while the remaining process areas create trailing indicators (endogenous)
- Candidate controls for correlation (and causation)
  - Change management
  - Release and configuration management (inventory)
  - Incident and problem management
  - Service level and availability management
  - Service catalog
  - Intrusion detection and access controls

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Summary

- Visible Ops is the result of years of studying high-performing IT operations and security organizations in conjunction with the ITPI
- Transformations are possible and repeatable
- Visible Ops shows how to make these transformations in just four, achievable steps

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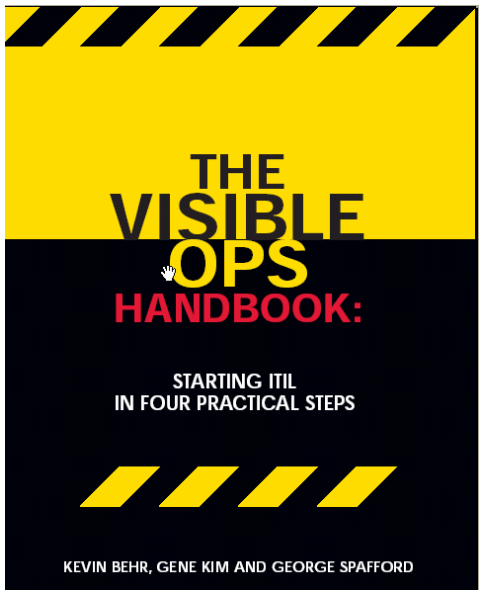

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