Automate or Die:
*Five network automation things you have to do*

Eric Hanselman, Chief Analyst
Overview of today’s presentation

The Five Things
Where are we now?
What’s the problem?
Moving forward
Automation decision framework
Q&A
The Five Things

Why wait?
- Systems integration
  - Information sharing
- Provisioning
  - Resource allocation
- Compliance and control
  - Review and revise
- Telemetry
  - Trends and health
- People
  - Building skills
Where Are We Now?

Most organizations have some automation...

- Doing the simple stuff
  - Scripts
  - Limited business assessments
- Critical tasks stay manual
  - Review
  - Change window limits
- Doing more can seem risky
  - Don’t break things
  - Hidden intent
  - Unknown effort to implement
  - Differing controls and vendors
Most Are Still Hammering Away...

Manual operations dominate

- Manual with Limited Automation Tools: 46.4%
- Automated with Manual Exception Handling: 38.3%
- Highly Manual: 8.6%
- Policy Based Automation and Orchestration: 5.5%
- Other: 1.2%

Source: 451 Research, Voice of the Enterprise: Servers and Converged Infrastructure, Workloads and Key Projects 2017
Q37 In general how would you describe your organization’s workload or service provisioning process?

Q29. Which of the following best describes your organization’s approach to NEW technology adoption?

Company culture, particularly as it pertains to new technology adoption, has a direct impact on workload or service provisioning process. The more skeptical, the more manual the environment.
What’s the Problem?

Network automation is hard

- It’s the inverse of compute automation*
  - Compute – Complexity at speed
    - Doing many atomic things
  - Network – Complexity at scale
    - Doing a few very big things
- Operations have higher risk
- Risk complicates transition

* Borrowed from Steve Riley, D20 Brass Band, who got it from Adrian Cockcroft, AWS/Netflix...
Why Bother?

Scale and speed will leave you in the dust

▪ Compute automation pressure
  ▪ Don’t be the constraint

▪ Security responses
  ▪ Enable damage limitation

▪ Hybrid cloud
  ▪ Dynamic extension

▪ Containers and microservices
  ▪ Too many, too fast
What do we need to do?
The five things are a minimum
- Systems integration
  - Establishing common links
- Provisioning
  - Repeatable operations
- Compliance and control
  - See and act
- Telemetry
  - More than alarms
- People
  - Overcoming concerns
Systems Integration

Establishing common links

- Feeding from sources of truth
- Resource assignment
  - IPAM and DNS
  - Path management
- Configuration management
  - Capture current state
  - Holding on to history
- Identity management
  - Scale
  - Control and accountability
Provisioning

Repeatable operations

- Allocation and alignment
  - Internal and external resources
  - Integrating performance parameters
    - Translating LAN and WAN
- Resource pool establishment
  - Controls for sharing
- Most important point of abstraction
  - Common tasks translated into specialized actions
Compliance and Control

See and act

- Maintaining touch with reality
  - Aligning configuration and control
  - Who’s on that segment?
- Correcting drift
  - ACL maintenance
  - Application alignment
  - Access updates
- Automated controls
  - Scenario planning
  - Reversions “undo” button
Telemetry

More than alarms

- Raising awareness through correlation
  - Aligning events and actions
  - Workload actions and effects
  - Distinguishing anomalies and trends
  - Catching the unknown

- Human machine teaming
  - Simplifying troubleshooting
  - Making associations between events
  - Automatic visibility
People

Overcoming concerns

- Establishing a vision of the future
  - CCIE’s to a greater cause
  - Really, truly killing CLI
    - Process, process, process!
- Skilling up
  - Matching tools and teams
- The NetDev debate
  - Who codes?
Learning to let go

Establishing trust

- Managing risk in the transition to automation
  - Capturing hidden policy and intent
  - Establishing safeguards
- Sharing control
  - Resource agreements
  - Preparing for policy
- Moving to abstractions
  - Normalizing activities
  - Standardizing operations
Start Automating the Right Things

The infrastructure transformation journey demands it

- Business processes
- IT processes
- Automating efficiently and effectively
  - Prioritizing the work
  - Aligning need with capabilities
  - Aligning cost with benefit
Automation Effectiveness Framework

The Automation Maturity Model
- Classifies 6 levels of automation

The Process Portfolios
- Business Process Portfolio
- IT Process Portfolio
- Each Process Documented using a Process Detail Sheet

The Automation Effectiveness Assessment
- An analytic technique used to evaluate and rate automation effectiveness
- Two sets of evaluation criteria
  - Managerial Evaluation Criteria
  - Maturity-Level Evaluation Criteria
- A Managerial Confidence Rating

The Findings and Recommendation Report
- Determines actions and timing
- Maps the impact of automation on value to the business
The Automation Effectiveness Framework

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<tr>
<th>Automation Maturity Level</th>
<th>Autonomous</th>
<th>Predictive</th>
<th>Contextual</th>
<th>Controlled</th>
<th>Assisted</th>
<th>Manual</th>
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<td>Real-time autonomic computing system equipped with artificial intelligence capable of self-configuring, self-healing, self-protection, and self-management.</td>
<td>Applications include feedback loops to machine learning algorithms that compare historic and current data to predict successful recommendations prior to an event.</td>
<td>Applications are situationally aware, track user activity, and are equipped with recommendation engines to contextually guide decision making during use.</td>
<td>Processes are managed and execute within an application, or are orchestrated across multiple applications, that stores/retrieves information and/or processes transactions.</td>
<td>Office productivity tools, electronic forms or task specific software utilities are used to automate some tasks and/or parts of a workflow.</td>
<td>Tasks, activities and decisions rely completely on human effort and intervention. No application software, office productivity tools or utilities are used.</td>
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Provoke Thought About Processes and Automations

Business Processes
- Strategic Value?
- Use?
- Organizational Span?
- Complexity Depth?
- Metrics?
- Discipline?
- Escalation?
- Documentation?
- Training?

IT Processes
- Strategic Value?
- Use?
- Toolchain Complexity?
- Toolchain Architecture?
- Metrics?
- Rigor?
- Escalation?
- Documentation?
- Training?
The Essence of Automation Effectiveness – 4 Things Needed

Codification
  • Repeatable tasks (logic) need to be easily and quickly codified and adapt as needed

Data
  • Needs to be curated and distributed, accurately and timely

Integration
  • Connections need to be in place and reliable among participant systems

Execution
  • Automations must be measured, monitored and controlled
Journeys You Don’t Want to make

Deciding what not to do
- Assessment defines suitability
- Aligning work and resources
  - Some processes can’t support
  - Lack of necessary elements
    - Documentation
    - Escalation
    - Metrics
Putting Automation to Work

Abstractions drive operational efficiency
- Effective across datacenter, service provider and cloud
- Ensuring that controls are doing what’s needed
- Greater understanding drives automation
  - Integrating awareness from process to technology
  - Increasing business relevant context
  - Greater context reduces risk
  - Completing the circle
Key Takeaways

Automating network operations will reduce risk and enable technology transitions

Comprehensive network automation is required to meet scale and speed needs

Simple assessments can drive successful automation outcomes