DevOps and Storage Management
Improving Storage Delivery Through Continuous Improvement and Automation

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What is DevOps?

- Collaborative Culture
- Automation Tools
- Metrics and Measurement
- Lean Principles
- Agile
What is DevOps

“a cross-disciplinary community of practice dedicated to the study of building, evolving and operating rapidly-changing resilient systems at scale.” - Jez Humble
What is DevOps?

- Multi-disciplinary teams sharing the same tools and metrics, using Lean and Agile principles to deploy and manage complex systems at scale.
What is Lean?

Lean management is an approach to running an organization that supports the concept of continuous improvement, a long-term approach to work that systematically seeks to achieve small, incremental changes in processes in order to improve efficiency and quality.
What is Lean?

Build

Learn

Measure

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What is Agile?

- A software development methodology that emphasizes close collaboration between developer teams and business experts, face-to-face communication, frequent delivery, and tight, self-organizing teams.
What is Agile?

Inputs from Customers, Team, Managers, Execs

Product Owner

1. Prioritized list of what is required: features, bugs to fix...

Product Backlog

2. Sprint Planning Meeting

Sprint Backlog

3. Team selects starting at top as much as it can commit to deliver by end of Sprint

Team

Task Breakout

Sprint

4. End date and team deliverable do not change

Sprint Backlog

Scrum Master

Daily Standup Meeting

Sprint Review

Finished Work

Sprint Retrospective
What is Agile?
What does this have to do with storage?

- Gather Metrics
  - Make them available to everyone
- Create and Improve Process
  - Break up projects into manageable and measurable tasks
  - Involve other teams
- Automate
Gathering Metrics

WE ♥ METRICS
Gathering Metrics – Service Metrics

- How long do tasks take?
- How many times do you do any given task?
- Is there anything that blocks your work?
- Record all failures
- Record all task blockers
Gathering Metrics - Events

- Storage Growth
- Free Capacity
- Total IOPS
- Latency
- Network Throughput
- FC Throughput
- All Failure and Error Events
Improve Processes
Continuous Improvement

- a long-term approach to work that systematically seeks to achieve small, incremental changes in processes in order to improve efficiency and quality
Continuous Improvement
Automation

AUTOMATE

ALL THE THINGS!
Automation

- LUN and Volume Creation
- LUN and Volume Expansion
- Adding and Tuning Hosts
- Configuring Snapshots and Replication
- Backup
- Monitoring and Alerting
- Incident Logging
Automation Tools
Putting it all Together

- Use service metrics to find repeated tasks
  - Automate all individual configuration tasks
  - Develop a task catalog
  - Develop a service catalog
- Use event metrics to set a benchmark
  - Use this benchmark to determine when a resource becomes “full”
  - Create alerts based on thresholds
Service Catalogs

- Keep it simple
  - Start with a small catalog
  - Limit choice to start
- There will be exceptions
  - Exceptions are OK!
  - Exceptions get processed by the continuous improvement loop
Wrapping It Up

- DevOps principles like Agile and Lean can be applied to traditional infrastructure teams
- Gather a set of baseline metrics and use ongoing metrics collection to continuously audit and improve processes
- Automate as many tasks as possible
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