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DevOps-Continuous Integration

Roles and Metrics

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Outline

- **Many responsibilities are moving from Ops and QC to development**
- Proposed division of responsibilities
- DevOps metrics

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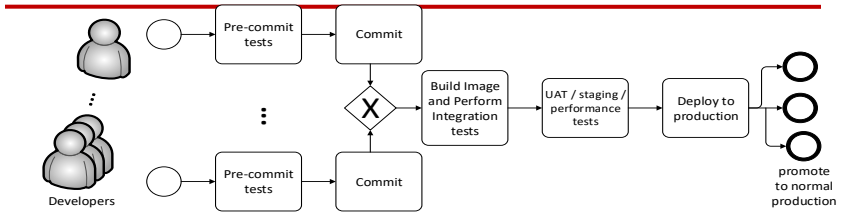
DevOps responsibilities that must be accomplished



Pre-production
- Tool installation, configuration, maintenance
- Testing configuration, test cases
- Design for deployment, monitoring

Deployment
- Approval
- Installation/roll back of new release

Production
- Monitoring configuration, analysis
- Incident response
- Resource allocation

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Traditional organization structure

Development
- Tool configuration,
- Test cases for integration
- Design for deployment, monitoring

Quality Control
- Test cases in staging
- Deployment approval

Operations
- Tool installation, configuration, maintenance
- Installation/rollback of new release
- Monitoring configuration, analysis
- Incident response
- Resource allocation

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Typical responsibility ratios

- Developers: 100 people
- Operations: 10 people
- Security: 1 person

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In DevOps world, things are changing

- How much change depends on domain of the organization
- Internet scale organizations (Amazon, Google, Netflix) are the leaders
- Firms with internet facing elements (financial, sales) are adopting some practices and investigating others

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Tool Management

- Some organizations, e.g. Netflix, Google, now have a separate department whose responsibility it is to create new tools.
- Other organizations allow developers to choose the tool suite
- Still other organizations have Operations choose the tools used in the deployment pipeline
- In every case, it is up to the development team to configure the tools for their own use.

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Deployment/rollback

- Continuous deployment – automated testing, automatic deployment after developer commits
- Continuous delivery – automated testing, deployment decision is manual. Regulations may require human sign off on deployment decisions
- Rollback decision is made either automatically based on some rules or by developers
  - Rollback is undoing a deployment

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Incident handling

- Very organization dependent. Options are
  - Developers now carry pagers and are the first responders – “You Build it-You Run It”
  - Operations are still the first responder
  - Separate team dedicated to reliability are the first responders. Google has role called “Site Reliability Engineers”

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Resource Allocation

- Now almost universally under control of developers.
- Result of the use of the cloud and virtualization.
- Leads to different type of charging model – charged based on resources used.

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Testing

- Movement toward more and more automated testing.
- Pre-requisite for continuous deployment

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Outline

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- **Proposed division of responsibilities**
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Attempt to organize DevOps based development

- Microsoft and Alibaba Cloud announced “Open Application Model”
- Defines responsibilities for developers and operators in terms of platform based tools
  - Developer builds applications in containers
  - Application operator packages and deploys containers
  - Infrastructure operator tunes as necessary at run time.

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Outline

- Many responsibilities are moving from Ops and QC to development
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- **DevOps metrics**

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DevOps metrics

- Without metrics there is no way to know if you are improving in your performance of processes
- The metrics an organization or team gathers is an indication of what is important to them
- Two kinds of metrics
  - Business
  - Operational

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Business metrics

- Time on site for customer
- Customer sign ins
- Application opens
- Revenue rates
- Purchases per visit
- Response times

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Operational metrics

- Performance - latency, page load speed
- Traffic – number of requests per unit time or number of users
- Availability – rate of failing requests or failing services
- Utilization
  - CPU
  - I/O

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Additional Metrics

- Deployment frequency.
- Deployment time.
- Customer tickets.
- Automated test pass %
- Defect escape rate.
- Failed deployments.
- Mean time to error detection (MTTD).
- Mean time to error recovery (MTTR).

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Summary

- Many responsibilities are moving from Ops and QC to development
- Developers are becoming responsible for
  - Deployment/rollback
  - Monitoring
  - Incident handling
  - Resource allocation
  - Testing and test generation
- The metrics gathered indicate what is important to an organization

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