SRE@MSFT

Site Reliability Engineering

Greg Veith
Director – Microsoft Azure SRE
They’re Alive!

Organizations Are Living Organisms
Evolution and Complexity
Azure Service Offerings
<table>
<thead>
<tr>
<th>Scale</th>
<th>24</th>
<th>&gt;100</th>
<th>3.3M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Datacenter Regions</td>
<td>24</td>
<td>&gt;100</td>
<td>3.3M</td>
</tr>
<tr>
<td>Datacenters</td>
<td>&gt;120k</td>
<td>~60</td>
<td>&gt;40%</td>
</tr>
<tr>
<td>New Azure customer subscriptions/month</td>
<td>&gt;120k</td>
<td>~60</td>
<td>&gt;40%</td>
</tr>
<tr>
<td>Distinct Azure Service Offerings</td>
<td>~60</td>
<td>&gt;40%</td>
<td>&gt;40%</td>
</tr>
<tr>
<td>Revenue from Startups and ISVs</td>
<td>&gt;40%</td>
<td>&gt;40%</td>
<td>&gt;40%</td>
</tr>
</tbody>
</table>
Transformation

Microsoft bets on Apache Spark to power its big data and analytics services

Office For Android Phones Now Available

Linux in the Cloud

Easily lift and shift Linux workloads to the cloud

Did you know that nearly one in three Azure virtual machines are Linux?

Redmond top man Satya Nadella: 'Microsoft LOVES Linux'
Learning Culture, Growth Mindset

Behind last night’s Bing outage

Microsoft says that a change that was being tested was mistakenly moved onto the live site, causing Thursday night’s sitewide outage.

Bing.com was down between about 6:30 and 7:00 PM Pacific Time on Dec 3, 2009. During this time, users were either unable to get to the site, or their queries were returning incomplete results page. The cause of the outage was a configuration change during some internal testing that had unfortunate and unintended consequences. As soon as the issue was detected, the change was rolled back, which caused the site to return to normal behavior. Unfortunately the detection and rollback took about half an hour, and during that time users were unable to use bing.com.

Microsoft Azure Storage Service Outage: Postmortem

This interruption was due to a bug that got triggered when a configuration change in the Azure Storage Front End component was made, resulting in the inability of the Blob Front-Ends to take traffic. The configuration change had been introduced as part of an Azure Storage update to improve performance as well as reducing the CPU footprint for the Azure Table Front-Ends.
Scaling Up Operational Models

Hi Greg!!! It looks like you are trying to build SRE at Microsoft. How can I help?
Welcome To The Team!

SR-easy
North is...
Symptoms of Success

- Availability and reliability meet SLOs
  - defend customer trust
- Eliminate human touches to prod
  - Toil elimination
- Speed up deployments
  - Reduce inventory, ship fast, safely

All the above areas reinforce measurement. Reliability’s foundation.
3 Strategic Pillars

Start SRE at Microsoft – Establish Principles

Prove the model – Apply Principles

Accelerate and improve – Scale the Principles
SRE Engagement Types

- Services at Planetary Scale
- Newer Service Facing Rapid Growth
- Greenfield Services or Redesign

- **Ops Transformation at Scale**
  SRE develops solutions to close operational gaps, fire suppressant, iterate toward transformation

- **Growth and Maturation**
  SRE attaches to team, develops targeted improvements to prepare for growth, get on call

- **Design and Architecture**
  Operability and continuous innovation, design for scale from the beginning
Production Readiness
3 Strategic Pillars

Start SRE at Microsoft - Establish Principles

Prove the model – Pilots – Apply Principles

Accelerate and improve – Scale the Principles
Service Facing Rapid Growth
Azure IoT
Established Service at Planetary Scale

Azure Storage
3 Prong Strategy

Start SRE at Microsoft - Establish Principles

Prove the model – Pilots – Apply Principles

Accelerate and improve – Scale the Principles
**Production Virtuous Cycle**

**Goal:** Enable this loop to run as fast and often as possible while maintaining SLOs.
### SRE Areas of Focus

<table>
<thead>
<tr>
<th>Area</th>
<th>Focus Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Metrics and Monitoring</strong></td>
<td>• Instrumentation, SLOs, Alarms, insights ➔ actions</td>
</tr>
<tr>
<td><strong>Infrastructure Engineering</strong></td>
<td>• Tooling, infra for global optima</td>
</tr>
<tr>
<td><strong>Release Engineering</strong></td>
<td>• Change Management, Deployment</td>
</tr>
<tr>
<td><strong>Incident Response</strong></td>
<td>• Enough Said</td>
</tr>
<tr>
<td><strong>Common Infrastructure</strong></td>
<td>• Integrating existing best in class infra</td>
</tr>
<tr>
<td><strong>Capacity &amp; Fleet Management</strong></td>
<td>• Build out, decomm, fleet understanding and mgmt</td>
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</tbody>
</table>
Metrics and Monitoring
Critical Moves, Learnings

Build and protect the SRE brand
Manage the change
Meet teams where they are
Grab a Shovel (and build a backhoe)
Find the bright spots
In Conclusion

gveith@microsoft.com