

End-customer and Provider Operations

-Martin G. Guldberg

Outline

- **What is an outage?**
- **Outage Root Cause Analysis (RCA) and Eradication**
- **New Project Bugs/RCA**

What is an outage?

Any node/card/blade/chassis/frame/process that drops “calls” (ex. data, SMS or voice) **IS** an outage!

- RCA needs to be treated as such no matter how brief

Provider responsibility is to our customers...no one else

Who is a “customer”?

- Mother/wife – making **urgent** call/SMS with tired kids, flat tire, stuck on the side of a road
- Business person - sending **critical** e-mail via an aircard
- Delivery person - delivering a package **on time** relying on ‘Navigator’ to give timely directions
- Business - email and video conferencing carried via 10Gbit Enet

Outage RCA and Eradication

- **Priority 1 - Outage Restoration**
 - If simplex outage, ensure traffic is on redundant equipment
- **Priority 2 - Outage Risk assessment**
 - Are customers or the system still at risk?
 - If yes...
 - Proper detection method required for all other nodes
 - Has the problem been replicated in a lab?
 - Has proposed workaround/fix/detection been tested in a lab?
 - Does the lab mirror commercial systems for testing the fix?
 - H/W type, S/W release, traffic loading, traffic mix, etc...

Customers are NOT a lab to test the product on!

Outage RCA and Eradication

- **Priority 3 – Thorough RCA/Problem Eradication**
 - **Was data available from system to get a RCA?**
 - **System must put out sufficient data to determine a thorough RCA when outage occurs**
 - **Examples: Core dump, stack dump, register snapshot, etc...whatever is needed to get a thorough RCA**
 - **Can the system be designed to not have the outage? - “purposely flawed by design”**
 - **Simplex is better than duplex outage**
 - **Was there an alarm put out alerting the operator to the outage?**
 - **Were operations teams clear that the alarm meant there was an impacting problem?**
 - **Can system be change to alert of a problem BEFORE an outage?**
 - **How did defect escape labs to impact customers?**

Outage RCA and Eradication

- **Priority 3 – Thorough RCA/Problem Eradication (cont.)**
 - Turn key or single POC vendors
 - “We don’t know what happened” – never an acceptable response
 - Did vendor get people on the conference bridge quickly enough?
 - Blaming a supplier is unacceptable
 - Is outage timeline accurate?
 - Known issues....why wasn’t action taken to prevent the outage?
 - Vendors should supply original documentation of when known issue was discovered and demonstrate process improvements

New Projects/Bug RCAs

- **Outages on pre-productions systems should be treated like a production outage**

- **RCA needed on escape defects/bugs**

“Do our customers have to find 100 bugs and get 100 patches to fix the issues?!...OR will we do a thorough/meaningful review to see what systemic flaw is in the system?”

- **How did defect escape vendor labs to impact customers?**

3 things to remember

- Our customers are the ones who really matter!
- Treat the system as our own and do whatever it takes to be successful.
 - Escalate – let management help us
 - Work with a sense of urgency
- Everything should be done to prevent outages and bugs from escaping lab testing – thorough RCA

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