CLOUD COMPUTING CONCEPTS

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DATACENTER OUTAGE STUDIES

Lecture E

WRAP-UP

Outages Are Inevitable

- Outages are inevitable
- We’ve seen how AWS, Facebook, The Planet kept affected users updated throughout
  - Frequent updates
  - Coupons/discounts
  - Published post-mortems afterwards
  - All these bolster customer confidence
- Many companies run dashboards with real-time information
  - Google Apps status dashboard
  - AWS dashboard

Not all Companies …

Not all companies are as open as those discussed

- RIM Apr 2007 – day-long outage; no details
- Hostway Jul 2007 – informed customers that it would move its DC Miami → Tampa, and that outage would be 12 hours
  - Outage was 3-7 days

Overall Lessons Learnt

- Datacenter fault-tolerance akin to human ailments/medicine today
  - Most common illnesses (crash failures) addressed
  - But uncommon cases can be horrible (unexpected outages)
- *Testing* is important
  - American Eagle, during a disaster, discovered that they could not fail over to backup DC
- Failed upgrades common cause of outage
  - Need a fallback plan

Overall Lessons Learnt (2)

- Data availability and recovery
  - BCP, Disaster-tolerance
  - Cross-DC replication, either by provider or by customer
- Consistent documentation
  - A Google AppEngine outage prolonged because ops did not know which version of docs to use for recovery
  - Google's fix: mark old documents explicitly as "deprecated"
- Outages always a cascading series of failures
  - Need more ways to break the chain and prevent outages

Overall Lessons Learnt (3)

- Other sources of outages
  - DOS-resistance
  - Internet outages
    - Under-sea cable cut, DNS failures, government blocking Internet (mostly via DNS)
    - Solution: Alternate DNS services
- Many failures are unexpected
- But there are also planned outages (e.g., kernel upgrades)
  - Need to be planned well
  - Steps documented and followed
  - Fallback plans in place