Unix as a Cloud

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Cloud Computing

Utility $\Rightarrow$ Ideology

User Perspective

Computer ⇒ Acess

Server ⇒ Service

Juggernaut Pioneers

- Google, Facebook & other $1B+ startups

- rigidly centralized

- hugely inefficient

Juggernaut Unix Users

- relatively minuscule regard for sharing

- massive multi-level self-repeating reinvention

- the industry of wasted effort & lost opportunity

Unix in 2011

- not fit for simple tasks anymore

- e-mail, web, file storage, etc

- any innovative cloud product

A Typical Disruption

- stretches platforms

- leverages massive resources

- is inherently open-minded

A Case Study

- a task for 100-1000+ machines

- need for a little more performance than theoretically possible

- complete reliance on open-source ecology

Heterogeny

- owned (4 DCs), rented (5 DCs), virtual

- boot from HDD, SSD, PXE/NFS, USB flash

- varying access, expected uptime and security

Heterogeneity

- primary roles: storage, processing, web, DB, memcache, sphinx

- hardware: from small virtual nodes to 72TB machines

- network: private/open, controlled/provided

Cloud Ideology

- multi-machine, multi-location abstractions

- failure anticipation and remediation

- deep automation

Unix as a Cloud

- lack of abstraction beyond a single host

- virtually zero hardware/kernel failure tolerance

- antique userland with manual transmission

Storage

- reliable storage, processing & streaming in one

- UFS2 per hard drive

- sha256-named objects, mapped to hard drives

Processing

- custom DB-backed dispatcher

- fault-tolerant race resolution

- limits and error handling

Configuration

- / on NFS $\Rightarrow$ / in git

- role-aware/multi-role config files

- LDAP $\Rightarrow$ passwd(5) in git

The Problem

- big clouds have very busy engineers working on them

- very little sharing (Hadoop, OpenStack)

- seminal opportunity for BSD

The Solution

- advocate sharing on the OS level (instead of middleware)

- start making BSD more convenient for large users

- embrace cloud ideology as a course of action

questions?

we're funding! (and hiring)

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