PlanetLab Current Status

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Overview

• PlanetLab is about 5 months old
• Development primarily here and Princeton
• Research topics at Berkeley only just emerging
• This talk is a overview of where we’re currently headed.
• Slightly Mothy-centric since Brent is ill
  – But go talk to him!
Deployment

- 101 nodes, 42 sites
- Line of University volunteer sites
- Some Industrial research volunteers
- Budget for colo centers
- Boot CD in development for next phase
Research Agenda

• Very early stages
  – S/w development, operations and support moving (slowly) to DSL team

• Current small-ish projects here:
  – Resource brokers
  – DHT benchmarking
  – InfoSpect monitoring
  – Spread-spectrum storage
  – Deployment languages
  – Economic resource management
Resource Brokers / Slices

• Brent, Mothy, Larry Peterson, etc.
• IPTPS: “Slices: Providing a Stable Core for Peer-to-Peer Applications”
• Key PlanetLab rsrc allocation issue
  – How does an application request a slice?
  – How is it allocated?
  – How does the process span multiple providers?
  – How are allocations verified?
DHT Benchmarking

• Mothy, Sean Rhea (Oceanstore)
• IPTPS: “CANs Need Application-Driven Benchmarks”

• Aims:
  – Design good benchmarks for DHTs/CANs/DOLRs
  – Get real results using PlanetLab
  – Demonstrate the differences between systems

• Currently: Tapestry, Chord
  – Pastry, Strawman in process
InfoSpect

Results of Prolog queries

Discovery tools / wrapper scripts

Observations as Prolog facts

Rules

Prolog Knowledge Base

Results

Ping

Ssh

Ganglia
InfoSpect monitoring

• Mothy


• Use of Prolog engine for PlanetLab fault diagnosis
  – “Axioms” prime the system
  – Small “driver scripts” discover information
  – Inference rules encode assumptions
  – Queries return anomalous conditions
InfoSpect example

• Trivial example:

  badstuff(Problem,Site) :-
    db_host(Site,DbHost,Dblp,_,_),
    ssh_greeting(Dblp,_),
    ping_failed(Dblp),
    swritef(Problem, '%%w (%%w) is filtering pings (and possibly other stuff)', [ DbHost,Dblp ]).

• About a dozen of these tests and growing.
• Runs continuously
  – Somewhat depressing results 😊
Spread-spectrum storage

• Mothy + Steve Hand (Univ. Cambridge)
• Remember interview talk 😊
• Transient, “soft capacity” storage for PlanetLab
  – User software distribution
  – Log file / results collection
• Other calls for storage services
  – Oceanstore, SFS,
Deployment languages

• Mothy, and whoever

• Appropriate languages for expressing the deployment of PlanetLab applications
  – Apply declarative techniques
  – Borrow ideas from component languages
  – Possible synergy with macroprogramming

• Just a wild and crazy idea right now
Economic Resource Management

• Brent, et.al.
• Policies built over slice model
  – Resource consolidators
  – etc.
• Lots of code being written
• Please ask Brent when he’s recovered
  – if he were here he would say a lot more.
Other work we know about:

- UCB: Oceanstore, ROC
- UWash scriptroute
- Duke AC/DC (adaptive overlays)
- Princeton: RON routing service
- Cambridge: PlanetProbe
- Rice: Topology-aware Pastry
- CMU: launching DoS attacks
- ...and many more
Summary

• Still “finding our feet” research-wise
• Lots of issues coming out of deployment
• Beginning to engage UCB students more
• Reasonably gaggle of research directions