PlanetLab Introduction

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Planetlab: What is it?

- 670 machines spanning 325 sites and 35 countries
  - nodes within a LAN-hop of > 3M users
- Supports *distributed virtualization*
  - each of 600+ network services running in their own *slice*
- RPI is part of it
Motivation

- A new class of services & applications is emerging that spread over a sizable fraction of the web
  - CDNs as the first examples
  - Peer-to-peer, ...
- Architectural components are beginning to emerge
  - Distributable hash tables to provide scalable translation
  - Distributed storage, caching, instrumentation, mapping, ...
- The next internet will be created as an overlay on the current one
  - as did the last one
  - it will be defined by its services, not its transport
    - translation, storage, caching, event notification, management
- There is NO vehicle to try out the next $n$ great ideas in this area
Slices
Slices
Slices
User Opt-in
Per-Node View

Node Mgr  Local Admin  VM₁  VM₂  ...  VMₙ

Virtual Machine Monitor (VMM)
Global View

PLC
Long-Running Services

- Content Distribution
  - CoDeeN: Princeton
  - Coral: NYU
  - Cobweb: Cornell
- Storage & Large File Transfer
  - LOCI: Tennessee
  - CoBlitz: Princeton
- Anomaly Detection & Fault Diagnosis
  - PIER: Berkeley, Intel
  - PlanetSeer: Princeton
- DHT
  - Bamboo (OpenDHT): Berkeley, Intel
  - Chord (DHash): MIT
Services (cont)

- Routing / Mobile Access
  - i3: Berkeley
  - DHARMA: UIUC
  - VINI: Princeton
- DNS
  - CoDNS: Princeton
  - CoDoNs: Cornell
- Multicast
  - End System Multicast: CMU
  - Tmesh: Michigan
- Anycast / Location Service
  - Meridian: Cornell
  - Oasis: NYU
Services (cont)

- Internet Measurement
  - ScriptRoute: Washington, Maryland
- Pub-Sub
  - Corona: Cornell
- Email
  - ePost: Rice
- Management Services
  - Stork (environment service): Arizona
  - Emulab (provisioning service): Utah
  - Sirius (brokerage service): Georgia
  - CoMon (monitoring service): Princeton
  - PlanetFlow (auditing service): Princeton
  - SWORD (discovery service): Berkeley, UCSD
Usage Stats

- Slices: 600+
- Users: 2500+
- Bytes-per-day: 3 - 4 TB
- IP-flows-per-day: 190M
- Unique IP-addrs-per-day: 1M
For more info....

- PlanetLab website: http://www.planet-lab.org/