

Performance Accounting Security

EmanicsLab – A Distributed Computing and Storage Testbed for EMANICS

*1st EMANICS Workshop on P2P Management
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***Based partially on original slides by Larry Peterson, Vivek S. Pai et al.
(Princeton University) and Timothy Roscoe (Intel Research Berkeley)**

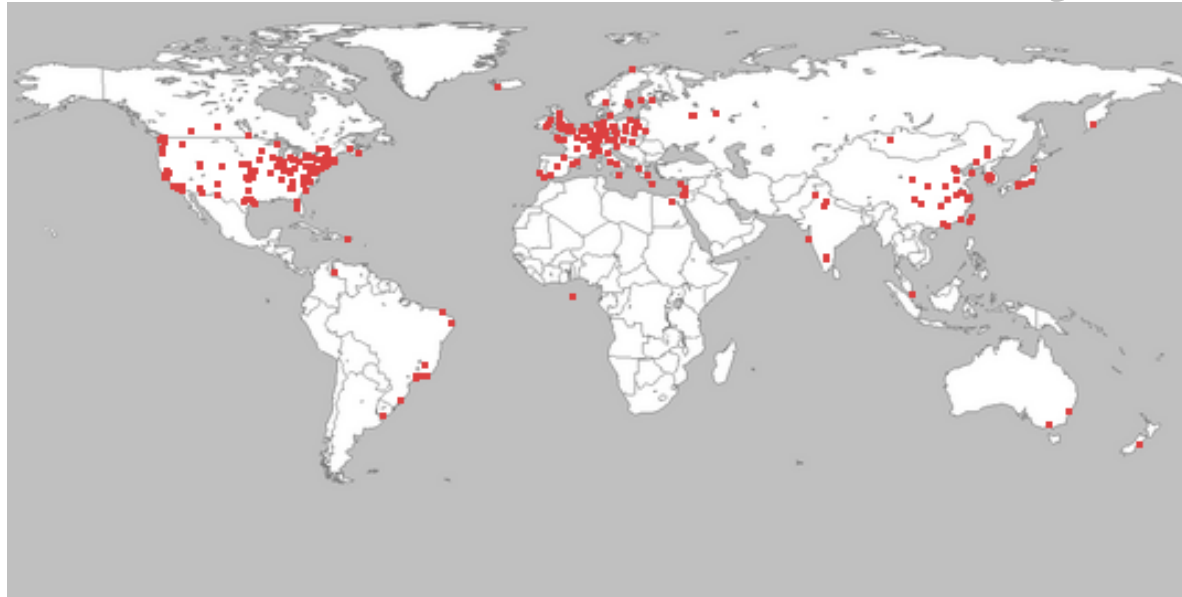
PlanetLab - What it is

- Large collection of machines spread around the world for distributed systems research
- Established in 2002 by UC Berkeley, Princeton University, and University of Washington
- Now a consortium of companies and universities
 - E.g. Intel, HP, and Google

PlanetLab - Value Proposition

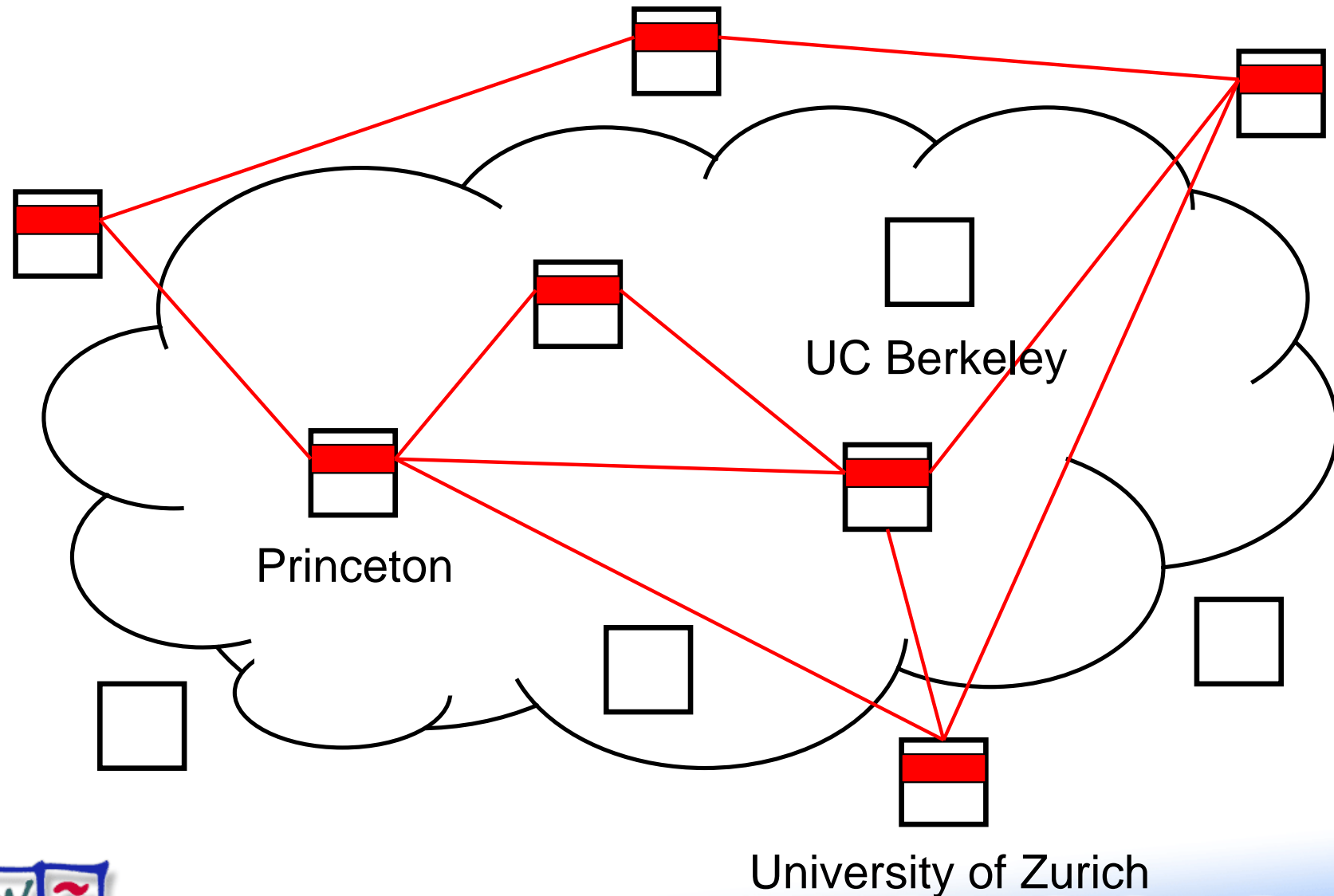
- Institutions join, provide 2 nodes at minimum
 - Hosted outside the firewall
- In exchange, researchers get a small slice of many machines worldwide
 - High benefit from a small entry fee

PlanetLab Today

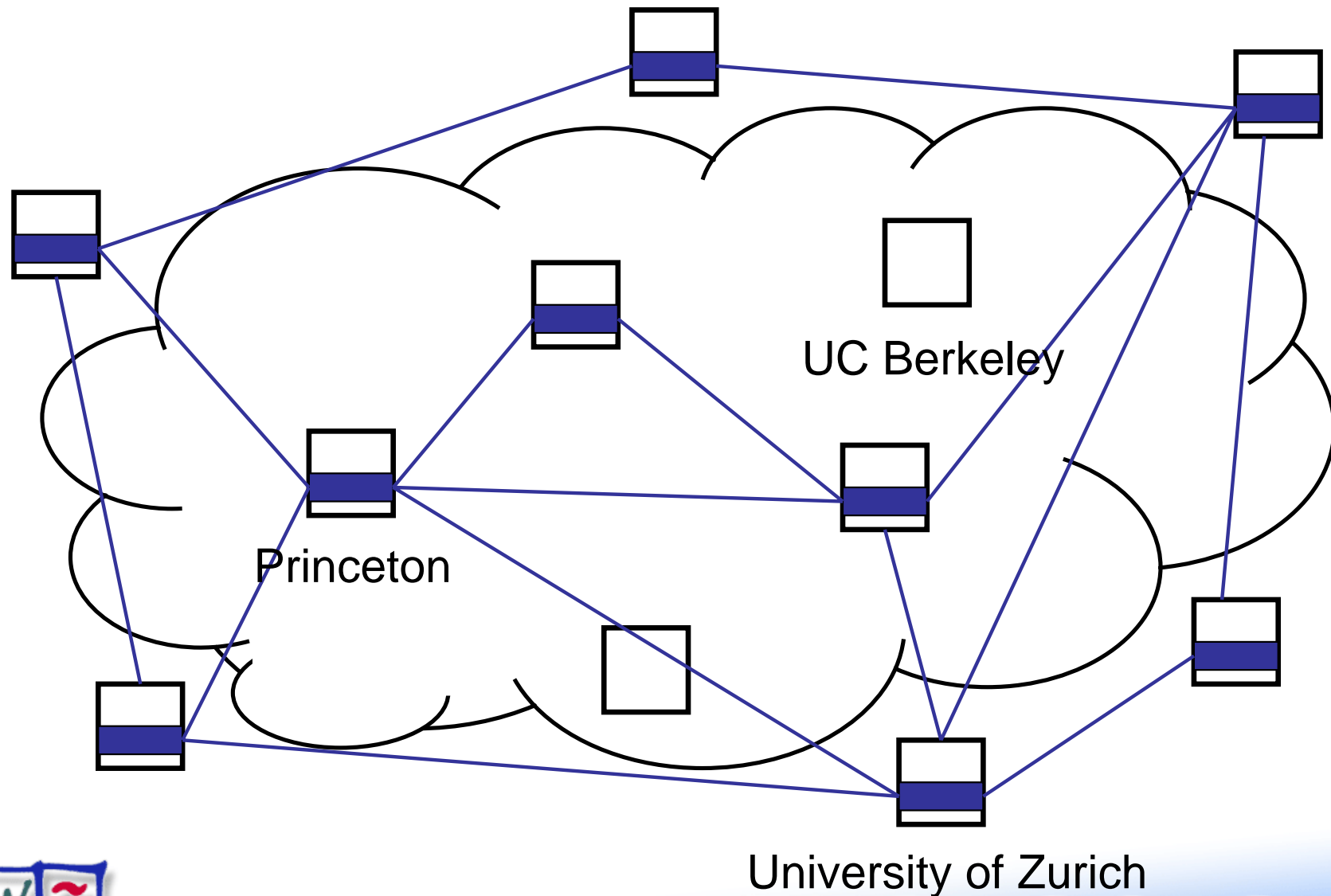


- 836 nodes spanning 412 sites and over 35 countries
 - Nodes within a LAN-hop of over 3M users
- Supports *distributed virtualization*
 - Each of over 500 network services running in their own *slice*
- Carries real user traffic
 - Generating over 4 TB / contacting over 1M unique IP addresses daily

PlanetLab Service Example 1



PlanetLab Service Example 2



PlanetLab: What does it have to do with P2P

- PlanetLab is a hybrid P2P system
 - Nodes are relatively autonomous
 - Local control through admin slice
- PlanetLab enables
 - Deployment of P2P applications at planetary scale
 - Across jurisdictional and administrative boundaries
 - Evaluation of P2P applications in a realistic setting
 - Real latencies between nodes, nodes may be unreliable
 - Nothing works as expected at scale!
- Many P2P applications are tested on PlanetLab
 - E.g. OceanStore, Bamboo, Chord, PeerMart
- PlanetLab Challenge
 - Remove PlanetLab Central entirely

Drawbacks of PlanetLab

- PlanetLab configuration and control is done centrally by PlanetLab administrators
 - Users needs cannot always be accommodated
 - Could be a problem if strong trust relationships and access protection mechanisms are required
 - E.g., for trace repositories
- Resources in PlanetLab are limited
 - Standard disk quota only 5GB per user on each node
 - Distributed flow collection requires much more storage
 - A load average of 7 is not uncommon on PlanetLab nodes

Benefits of EmanicsLab

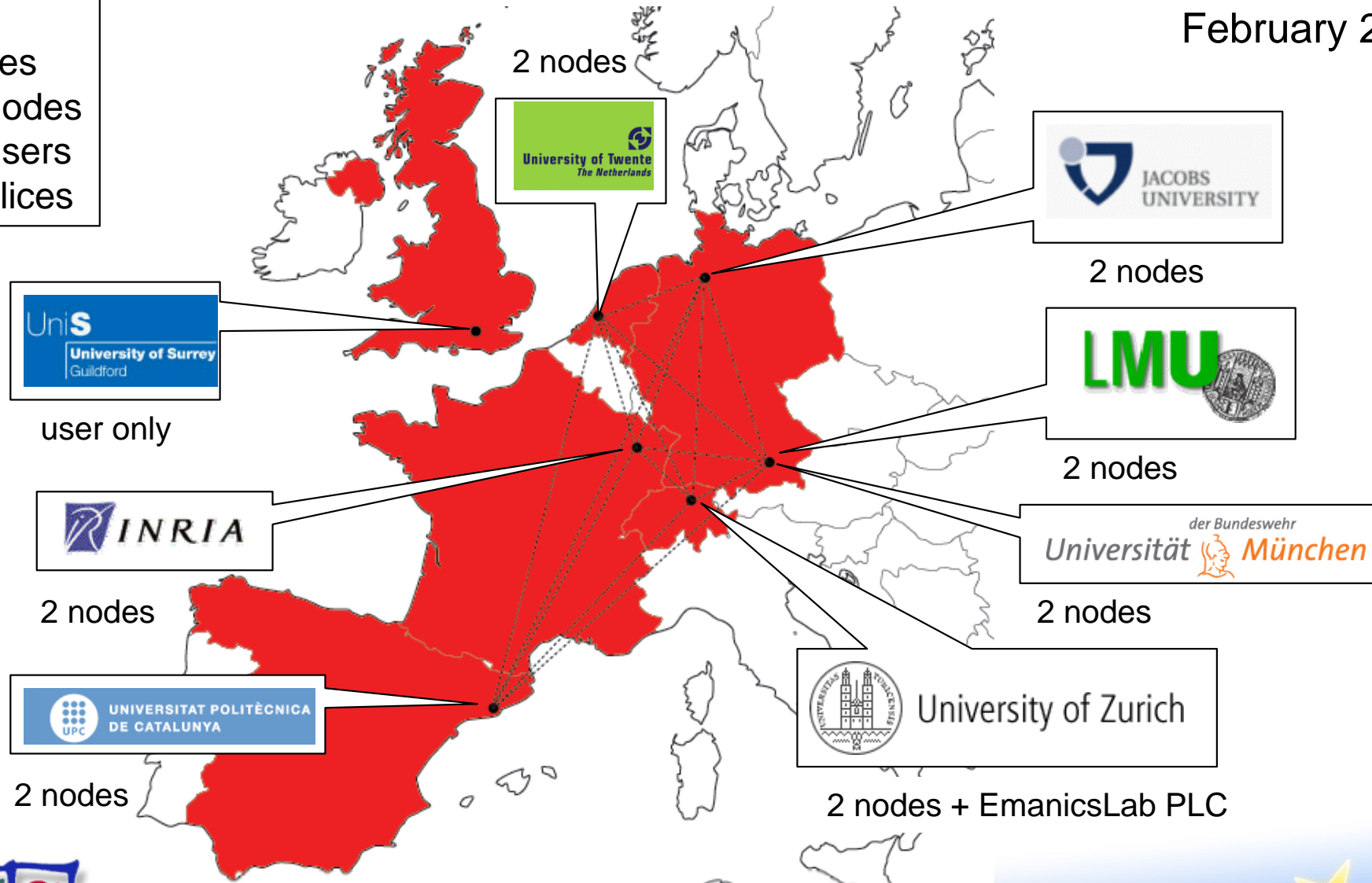
- EmanicsLab is dedicated to Emanics
 - Enables the flexible allocation of resources to research activities within Emanics
 - Ensures that the control of the testbed stays within the NoE
 - Access to the testbed can be restricted if necessary
 - Extensions or changes to the testbed can be done
 - E.g., use of a different virtualization platform
 - Specific services supporting research on network and service management can be provided
 - E.g., distributed trace repositories

EmanicsLab Sites

February 2008

Total:

- 8 sites
- 14 nodes
- 30 users
- 11 slices



EmanicsLab Nodes

Site	Hostname	RAM	HDD	CPU
UniZH	emanicslab1.csg.uzh.ch	1 GB	500 GB	Pentium 4, 3.6 GHz
	emanicslab2.csg.uzh.ch	1 GB	500 GB	Pentium 4, 3.6 GHz
IUB	emanicslab1.eecs.jacobs-university.de	1 GB	80 GB	Pentium D, 2.8 GHz
	emanicslab2.eecs.jacobs-university.de	1 GB	80 GB	Pentium D, 2.8 GHz
LMU	emanicslab1.lab.ifi.lmu.de	1 GB	800 GB	Pentium 4, 3 GHz
	emanicslab2.lab.ifi.lmu.de	3.6 GB	1080 GB	Core 2, 2.13 GHz
UniBW	emanicslab1.informatik.unibw-muenchen.de	2 GB	150 GB	Xeon, 3.0 GHz
	emanicslab2.informatik.unibw-muenchen.de	2 GB	150 GB	Xeon, 3.0 GHz
UPC	moscu.upc.es	1 GB	200 GB	Athlon XP, 1.4 GHz
	muro.upc.es	1 GB	250 GB	Core 2, 2.13 GHz
INRIA	host1-plb.loria.fr	2 GB	750 GB	Pentium 4, 3.0 GHz
	host2-plb.loria.fr	3 GB	750 GB	Core 2, 2.93 GHz
UT	emanicslab1.ewi.utwente.nl	4 GB	2000 GB	Dual Core Xeon, 3.0 GHz
	emanicslab2.ewi.utwente.nl	4 GB	2000 GB	Dual Core Xeon, 3.0 GHz
		27.6 GB	9290 GB	

EmanicsLab Slices

Sites	Principal Investigators	Slices	Users
UniZH	David Hausheer, Cristian Morariu, Thomas Bocek	uzh_voip uzh_datta uzh_fastss uzh_iploc	Stefan Huber, Gregor Schaffrath Cristian Morariu, Nicolas Baumgardt, Feng Liu Dalibor Peric, Thomas Bocek, Fabio Hecht Martin Waldburger, Stefan Bösch
IUB	Juergen Schoenwaelder	iub_buglook	
LMU	Feng Liu		
UniBW	Frank Eyermann	unibw_asam	Frank Eyermann
UPC	Pau Valles	upc_sblomars	Pau Valles
INRIA	Emmanuel Nataf	inria_p2psip inria_p2prevocation Inria_jump	Balamurugan Karpagavinayagam Thibault Cholez Emmanuel Nataf
UT	Ramin Sadre	ut_snid	Ramin Sadre
UniS	Stylianos Georgoulas		

Further EMANICS partners can join, if they like to use EmanicsLab

EmanicsLab Monitoring: PlanetFlow

PlanetLab
An open platform for developing, deploying, and accessing planetary-scale services

[Welcome](#) [Basic Search](#) [Advanced Search](#) [Browse By Slice](#) [Browse By Source](#) [Archives](#) EmanicsLab Node: emanicslab1.csg.uzh.ch

Browse By Slice

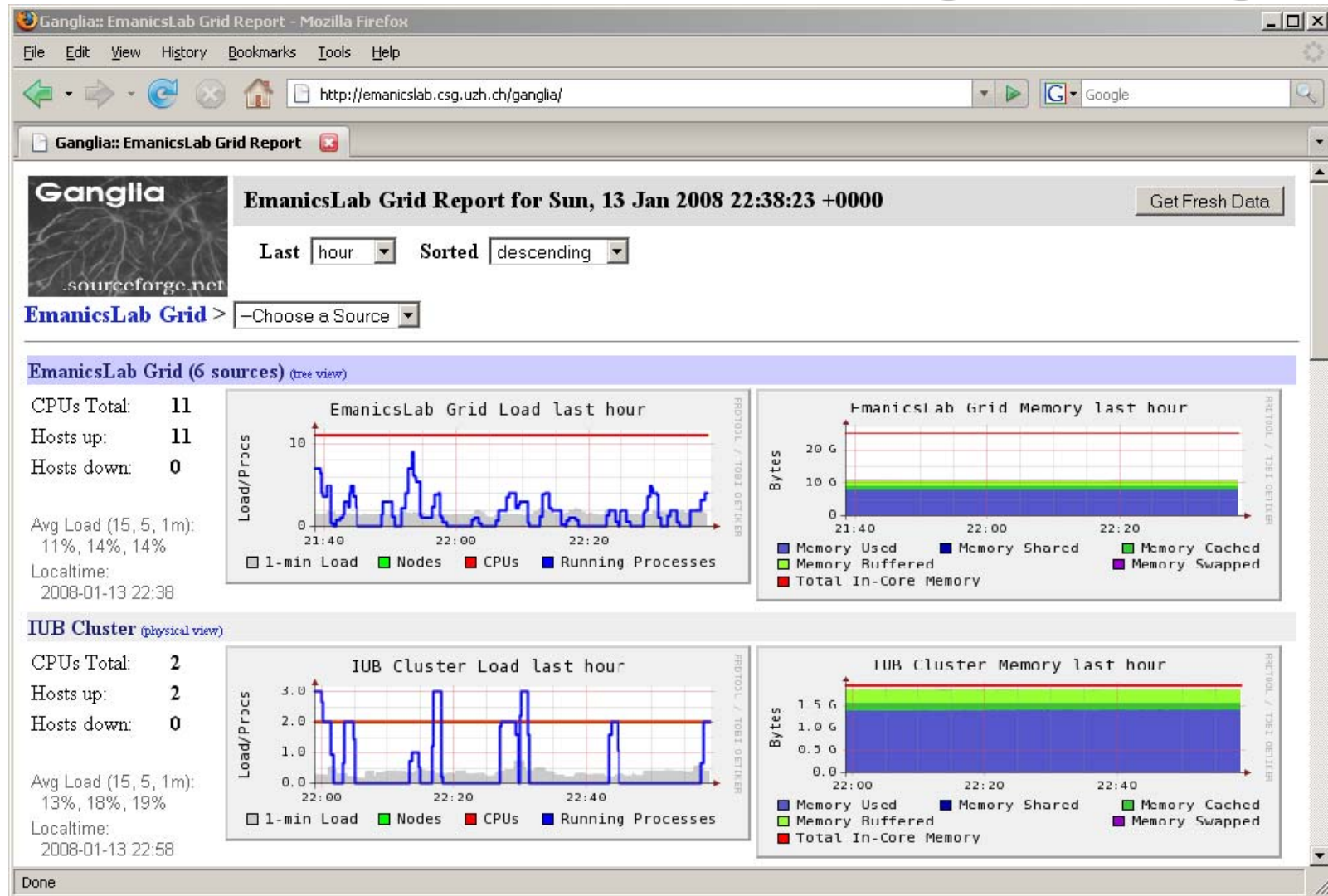
Sunday, January 13, 2008

Click **Slice**, **Flows**, **MPackets**, or **MBytes** to sort the table on that column, or to toggle the sorting order if the table is already sorted on that column. Click **Calculate...** to view the detailed statistics for a particular row if they are not already visible.

Slice	Flows	Percent	MPackets	Percent	MBytes	Percent	Source IPs	Destination IPs	Top Destination	MBytes	Percent
pl_ganglia	5156	41.23%	0.07	53.18%	38.49	58.91%	1	2	192.41.135.194	37.63	97.77%
root	3678	29.41%	0.06	42.80%	26.52	40.59%	1	18	192.41.135.198	22.04	83.12%
connection-refused	3595	28.75%	0.00	2.88%	0.18	0.28%	1	80	192.41.135.194	0.17	93.37%
icmp-reply	3	0.02%	0.00	1.05%	0.11	0.17%	1	3	192.41.135.195	0.11	99.95%
icmp-unreachable	72	0.58%	0.00	0.09%	0.04	0.06%	1	72	221.208.208.91	0.00	5.43%
Total	12504	100.00%	0.13	100.00%	65.34	100.00%					

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EmanicsLab Monitoring: Ganglia



EmanicsLab Monitoring: ElabMoni

EmanicsLab Slice Monitoring

http://...

Link Unit

- Usage Overview

Quick Stats

Nodes reporting: 14
Total memory used: N/A
Total memory used(%): N/A

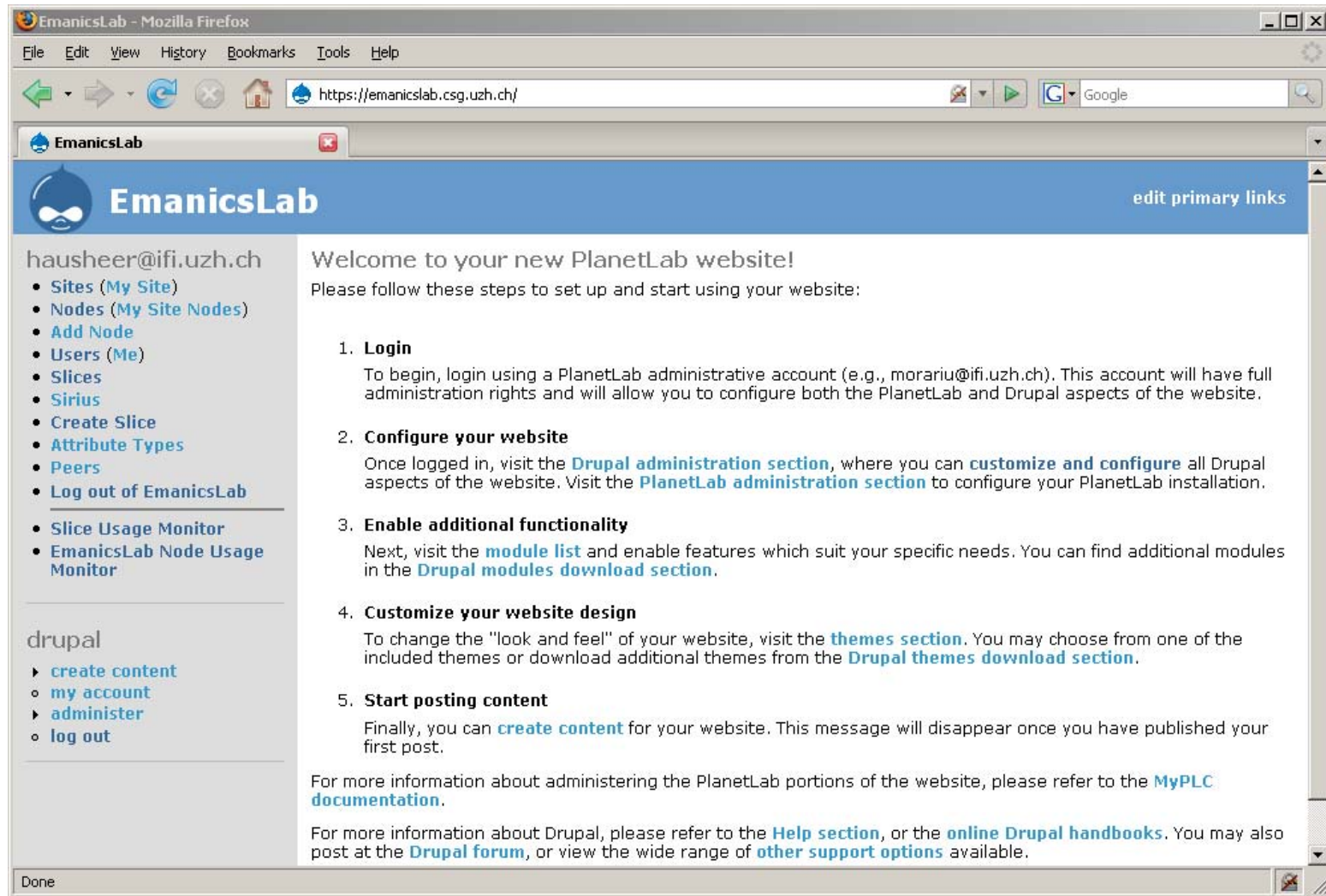
Average usage for the last 60 seconds:

Slice Name	Total CPUs	Total MEM
pl_ganglia	0.1833	37.55 MB
pl_netflow	0.1758	658.05 MB
upc_test	0.0383	6.39 MB
root	0.0000	57.09 MB

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EmanicsLab Web Interface



The screenshot shows a Mozilla Firefox browser window displaying the EmanicsLab website. The address bar shows the URL <https://emanicslab.csg.uzh.ch/>. The page features a blue header with the EmanicsLab logo and the text "edit primary links". Below the header, the user email "hausheer@ifi.uzh.ch" is displayed. The main content area contains a welcome message and a list of steps to set up the website:

- 1. Login**
To begin, login using a PlanetLab administrative account (e.g., morariu@ifi.uzh.ch). This account will have full administration rights and will allow you to configure both the PlanetLab and Drupal aspects of the website.
- 2. Configure your website**
Once logged in, visit the [Drupal administration section](#), where you can **customize and configure** all Drupal aspects of the website. Visit the [PlanetLab administration section](#) to configure your PlanetLab installation.
- 3. Enable additional functionality**
Next, visit the [module list](#) and enable features which suit your specific needs. You can find additional modules in the [Drupal modules download section](#).
- 4. Customize your website design**
To change the "look and feel" of your website, visit the [themes section](#). You may choose from one of the included themes or download additional themes from the [Drupal themes download section](#).
- 5. Start posting content**
Finally, you can **create content** for your website. This message will disappear once you have published your first post.

For more information about administering the PlanetLab portions of the website, please refer to the [MyPLC documentation](#).

For more information about Drupal, please refer to the [Help section](#), or the [online Drupal handbooks](#). You may also post at the [Drupal forum](#), or view the wide range of [other support options](#) available.