Open Source Network Infrastructure for Health Information Systems

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Objective

This paper describes a
network infrastructure based on
Open Source Software implanted in an academic
hospital and medical school at the Federal University
of São Paulo (UNIFESP), in Brazil

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Free / Libre / Open Source Software - FLOSS

Software whose source code is available under a license that allows users to:

- change
- improve
- redistribute

Motivation

Why NOT using proprietary software?

In the context of a public university and academic hospital in Brazil

LOW BUDGET

no provision for
expensive software upgrade and update

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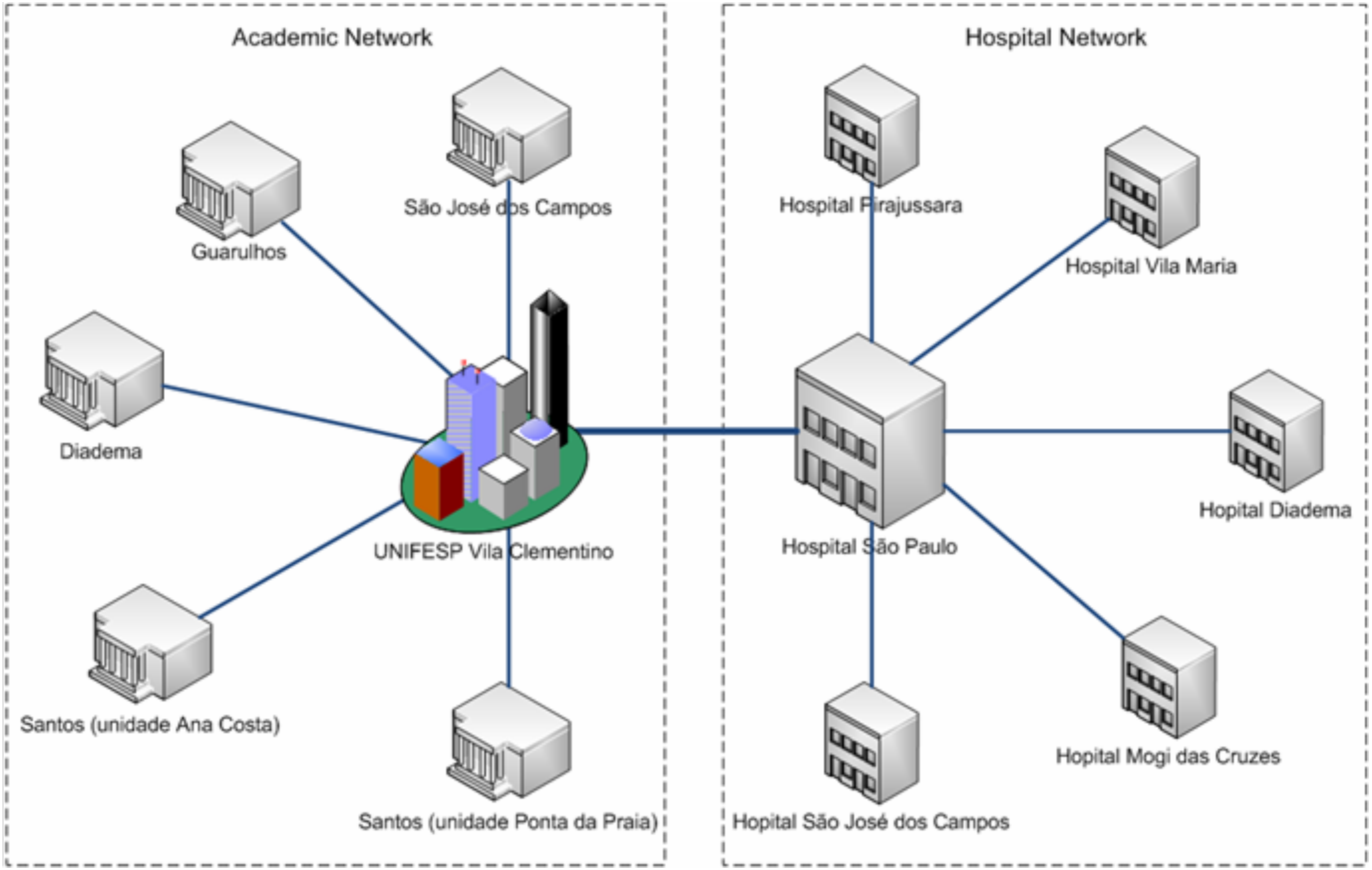
Academic & Hospital Networks



200 Servers ← 90% OpenSource Based

4,000 Workstations ← Multiple end-user platforms
MS-Windows, MacOS, Linux, FreeBSD,
SunOS, IRIX, Tru64

7,000 Users

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Network Service Infrastructure Based on FLOSS

- Server Operating Systems
  - Linux
  - FreeBSD
  - NetBSD
  - OpenBSD

Core OS services
Routing and Bridging
NAT - Network Address Translation
Network Packet Filtering

- Basic Network Services
  - DHCP – Workstation Configuration
    - ISO DHCPD
  - DNS – Name Resolution
    - DJB TinyDNS
  - Proxy – Internet Cache
    - Squid
    - SquidGuard
  - Authentication/Authorization
    - FreeRadius
    - OpenLDAP

Optimize Bandwidth Usage with cache

Centralized Directory Based on LDAP

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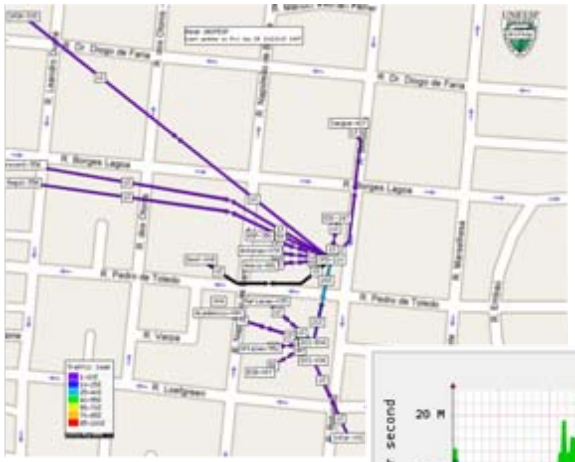
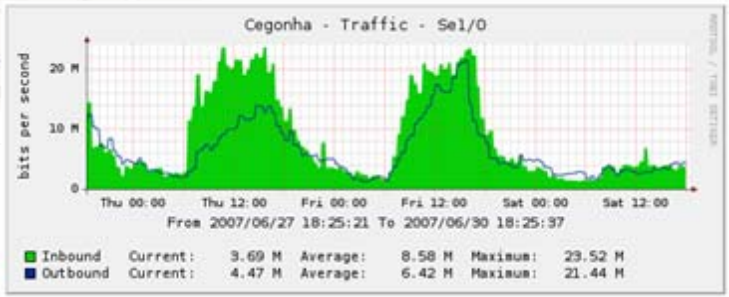
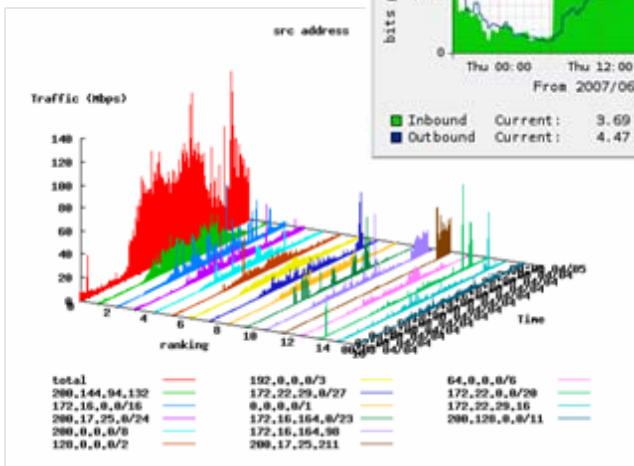
Network Monitoring

- Monitoring
  - MRTG
  - CACTI
  - WeatherMap
  - Nagios
  - Aguri
  - ArpWatch
  - NMAP
  - NTop
  - Bmon
  - Wireshark







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End-User Services

- Voice over IP
  - Asterisk
  - OpenSER
- Web Services
  - Apache
  - OpenSSL
- Remote access
  - OpenSSH
- File and printing
  - Samba
  - CUPS
- Database Management
  - PostgreSQL
  - MySQL

- E-mail
  - Postfix
  - SpamAssassin
  - ClamAV
  - Amavisd
  - MailScanner
  - Postgrey
  - Courier
  - Cyrus
  - MailMan
  - HordeIMP
- Backup
  - Amanda

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Conclusion

- No cost and frequent software

  UPGRADES and UPDATES

  – Security fixes

  – Bug corrections

  – New features

- Software customization

  – Staff adds specific functionalities

- Reliability, Security, Performance

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