

Massachusetts Institute of Technology

MIT Update

Ivy+ @ Brown

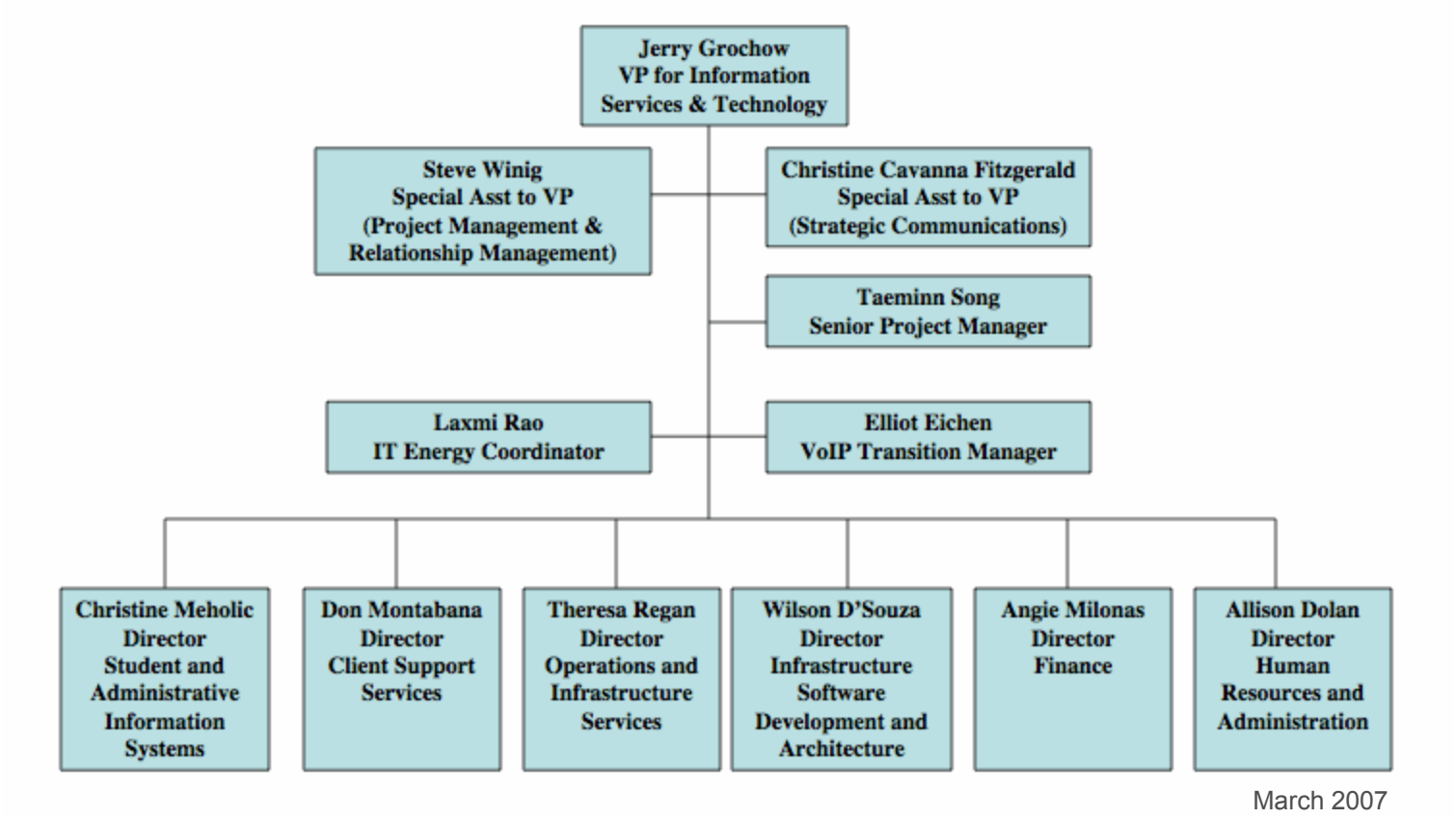
Dennis Baron

Elliot Eichen

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May 1, 2007

IS&T Organizational Chart

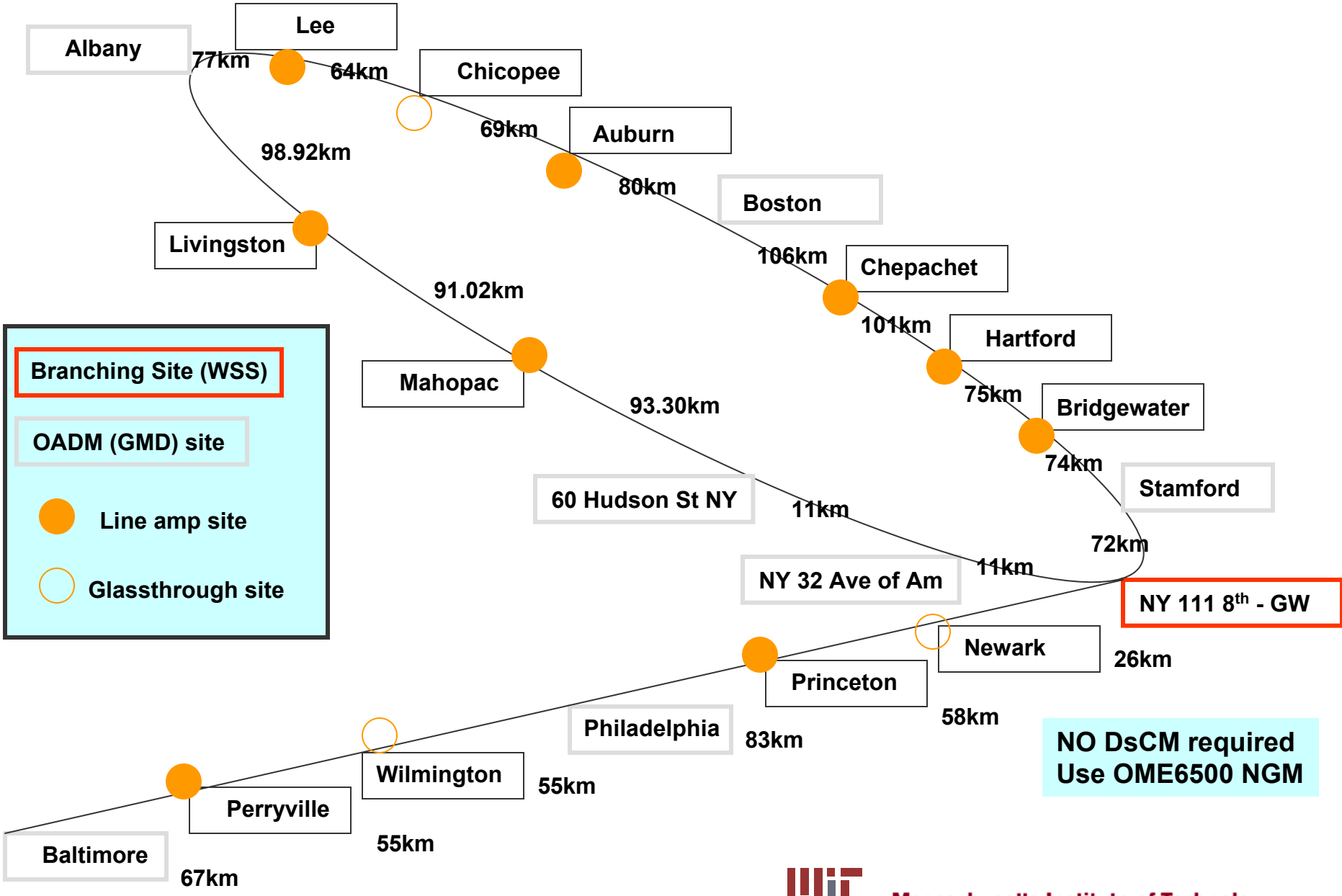


March 2007

MIT Regional Optical Network

- MIT completed the acquisition of two strands of dark fiber connecting Boston, New York City, Albany and Baltimore in March of 2006.
- MIT completed selection of Nortel as the DWDM vendor in September 2006.
- Network will provide for 72 10Gb or 40Gb wavelengths across the optical network.
- No dispersion compensation used within the network.
- Provides MIT connectivity to key regional Internet exchange points.

MIT Regional Optical Network - 72 10Gb or 40Gb λ



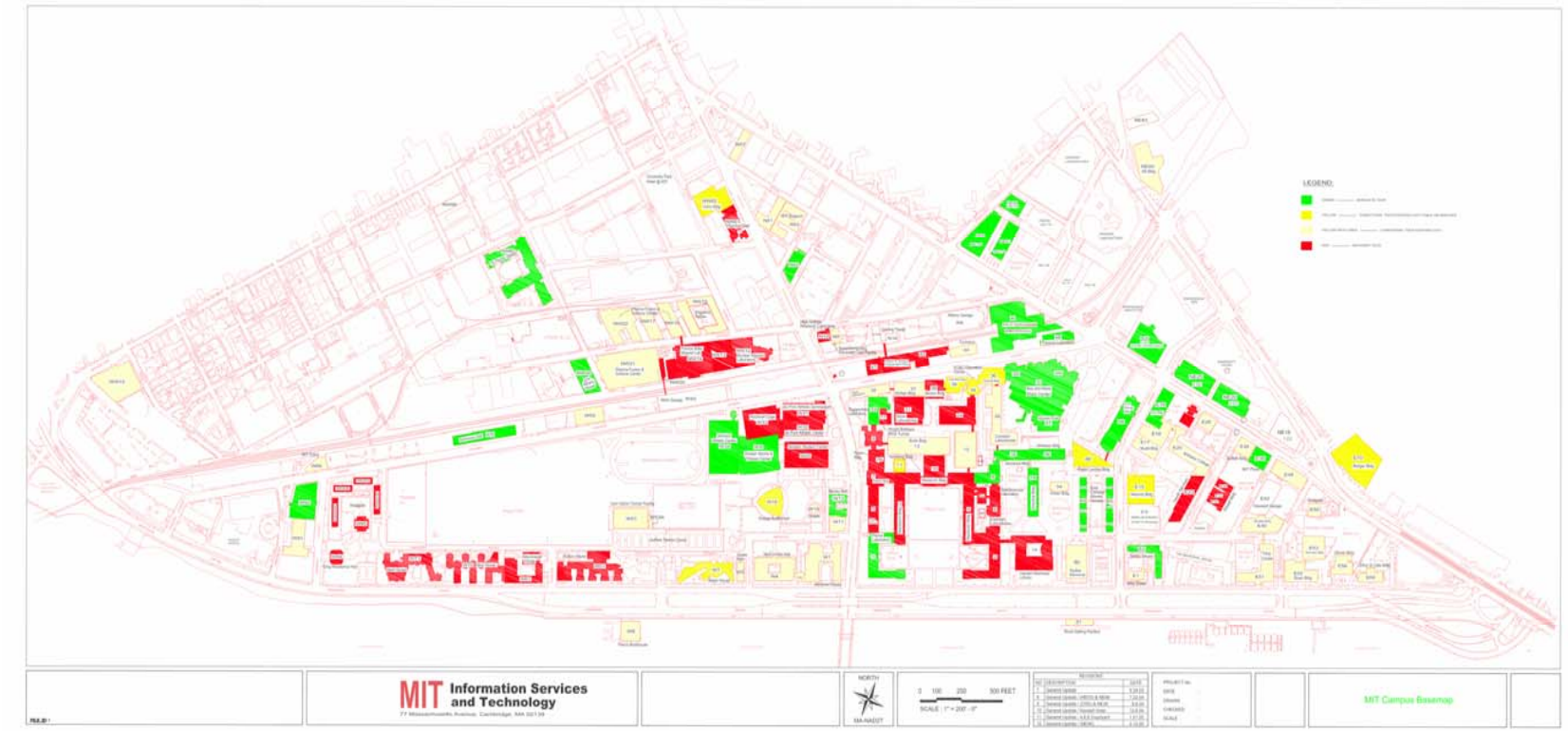
MIT Wireless Network

- Complete wireless coverage throughout the MIT campus
- Initial deployment consisted of over 3000 access points throughout the campus.
- While initial deployment delivered wireless technology, user expectations have increased as have demands for higher levels of service.
- Beginning to explore trial deployments of 802.11n before the end of the year.

MIT Wireless Network Map



MIT wired network - January 2004



MIT wired network - June 2007



Collocation Services (in transition)



Building W91 - Co-Location Facility



W91 - January 2007



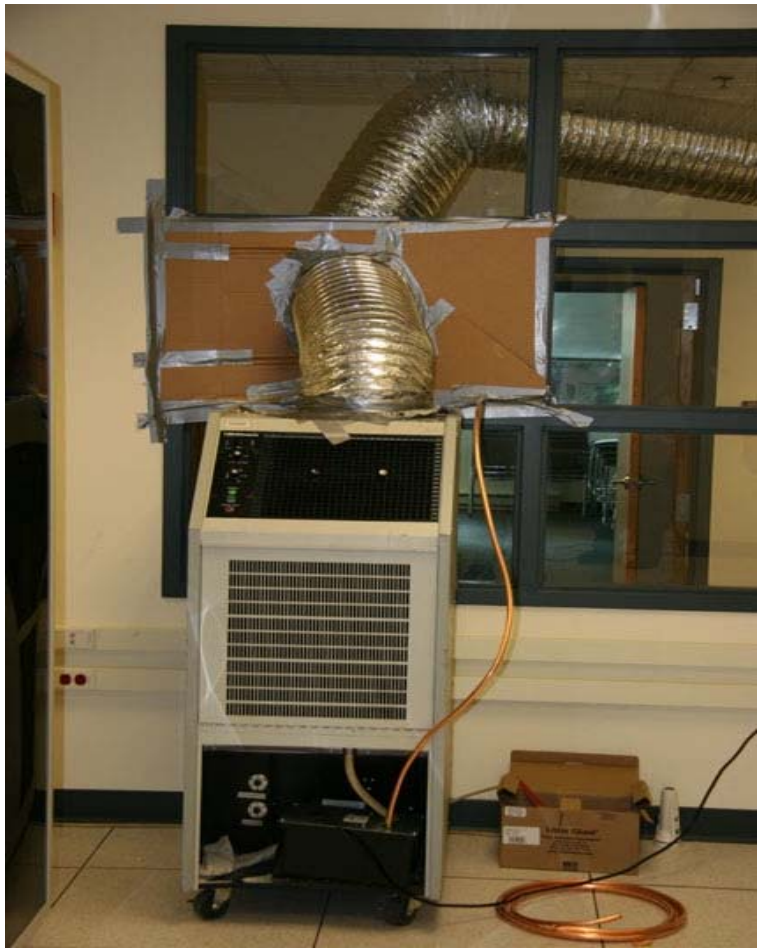
Building 24: August, 2005



Building 24: January 2007



W92-130: July 2005





W92-130: January 2007



Current Telephony Infrastructure

- Personal Disclaimer: Not Verizon/L3/Genuity/GTE



- Legacy Infrastructure:
  - 5E, 8600 lines BRI-ISDN, 12500 lines analog. ISDN generally does not have power backup at the closet.
  - Octel 350 voicemail.
  - OSS: ICE-9.
- VoIP Pilot
  - ~ 800 VoIP endpoints (Polycom 601/650/430)
  - OpenSER (3 tier proxy infrastructure), asterisk (voicemail), cisco (PRI-MGWs line-side on the 5E).
  - Internally developed OSS for CPE * infrastructure configuration (encrypted configurations, url delivered via DHCP).

VoIP Transition Plan

- **Phase I:**
  - IP-Centrex (Sylantro) + unified voicemail platform (Iperia integrated across Sylantro and legacy 5E) + security & peering infrastructure (SBCs).
  - 911/campus police policy issue.
  - Managed CPE (polycom), un-managed CPE.
  - SIP student accounts (DIDs, 5 digit outbound).
  - TLS/SRTP.
  - Ad-hoc/pilot support for WiFi/VoIP
  - Analog emergency & non-POTS services (Fax, POS, etc.) remain on 5E.
  - PRI connected M-GWs through the 5E.

VoIP Transition Plan

- **Later Phases:**
  - SIP/VoIP Peering. (Interesting opportunities for simple convergence).
  - NENA I2+ support for 911/100. Location mining at the switch port/access point level.
  - Re-homing remaining PRI's to be trunk side-carrier facing.
  - SIP/H264 video conferencing & "telepresence."
  - Gradual replacement of most analog services (fax, point of sale, etc.). Potential replacement of 5E (small PBX or outsource) for support of non-transitioned analog lines.
  - True F/W convergence (hard $$) – more likely in the GSM world.
  - 5E OSS' replacement.

Pilot Architecture

Open Source



Internal Access (Line Side)

Location dB

Outbound Proxy
Pilot:openSER

Shared Services

ENUM (DNS)

Internal (routing) Proxy
Pliot: openSER

Messaging
Pilot:Asterisk

Modem, point of sale, alarms, etc.

External Access (Trunk Side)

DMS Proxy
Pilot:openSER

VoIP Gateways
Pilot:Cisco 5850

5E

Fax

PSTN

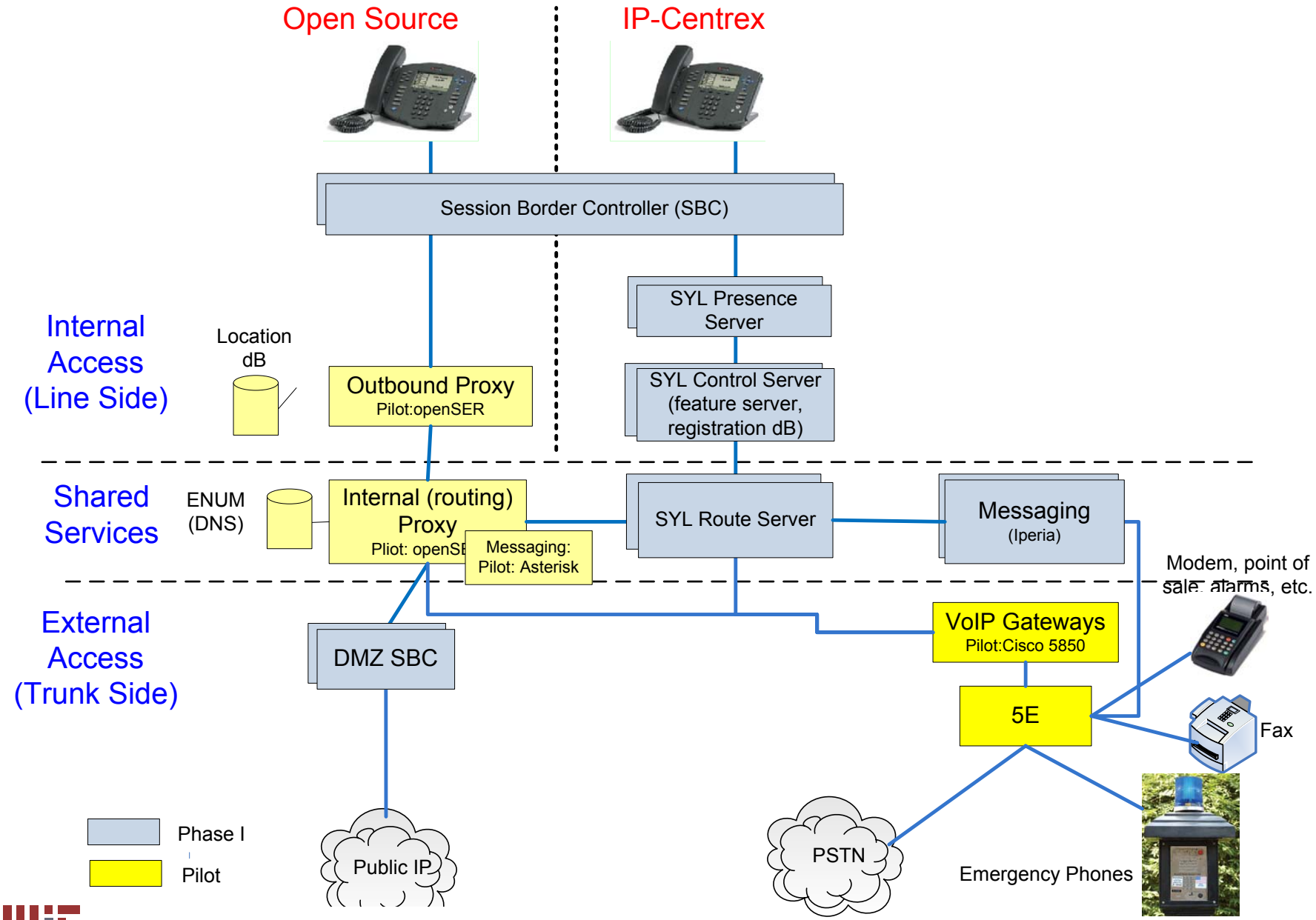
Public IP

Emergency Phones

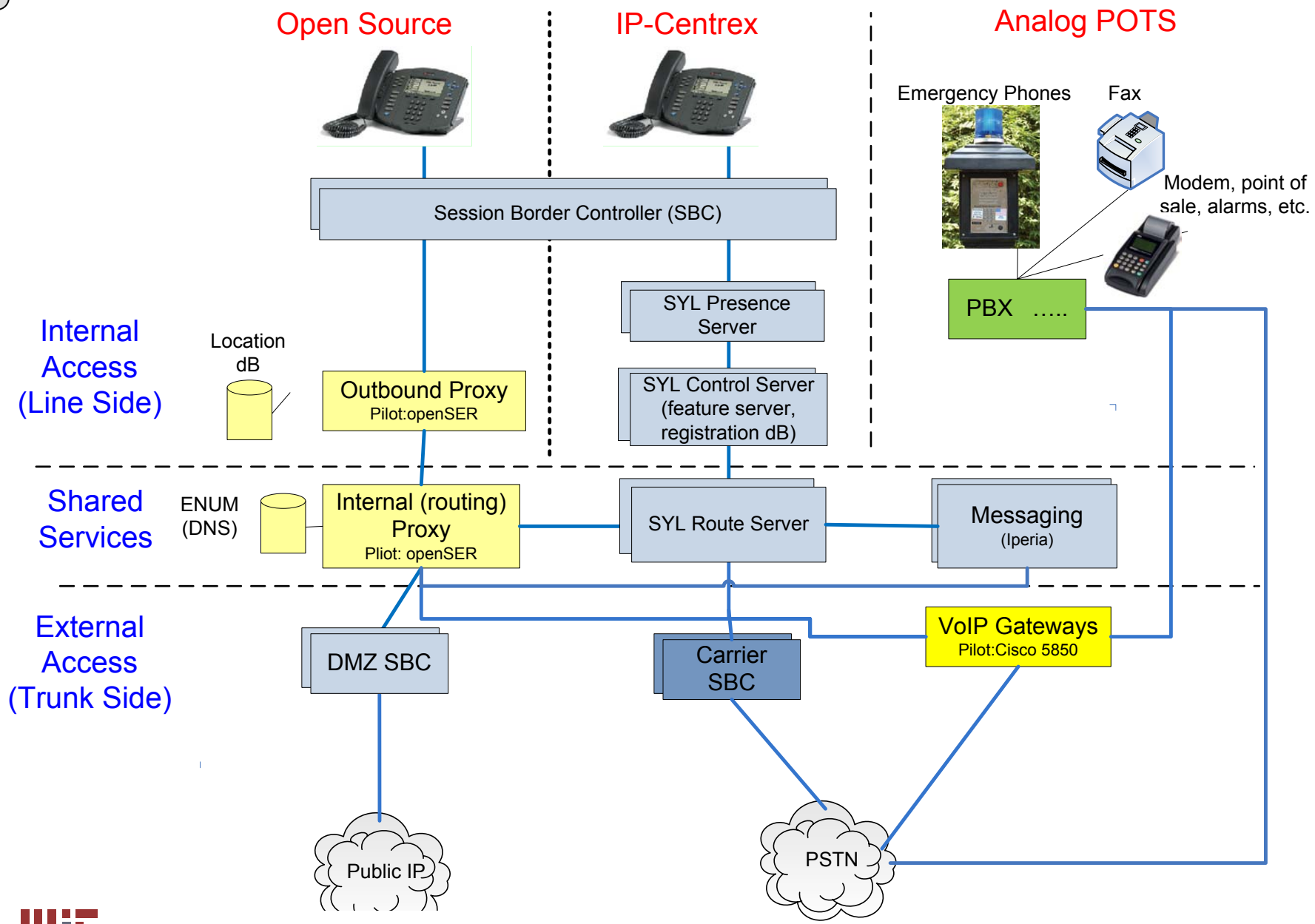


Pilot

Phase I Architecture



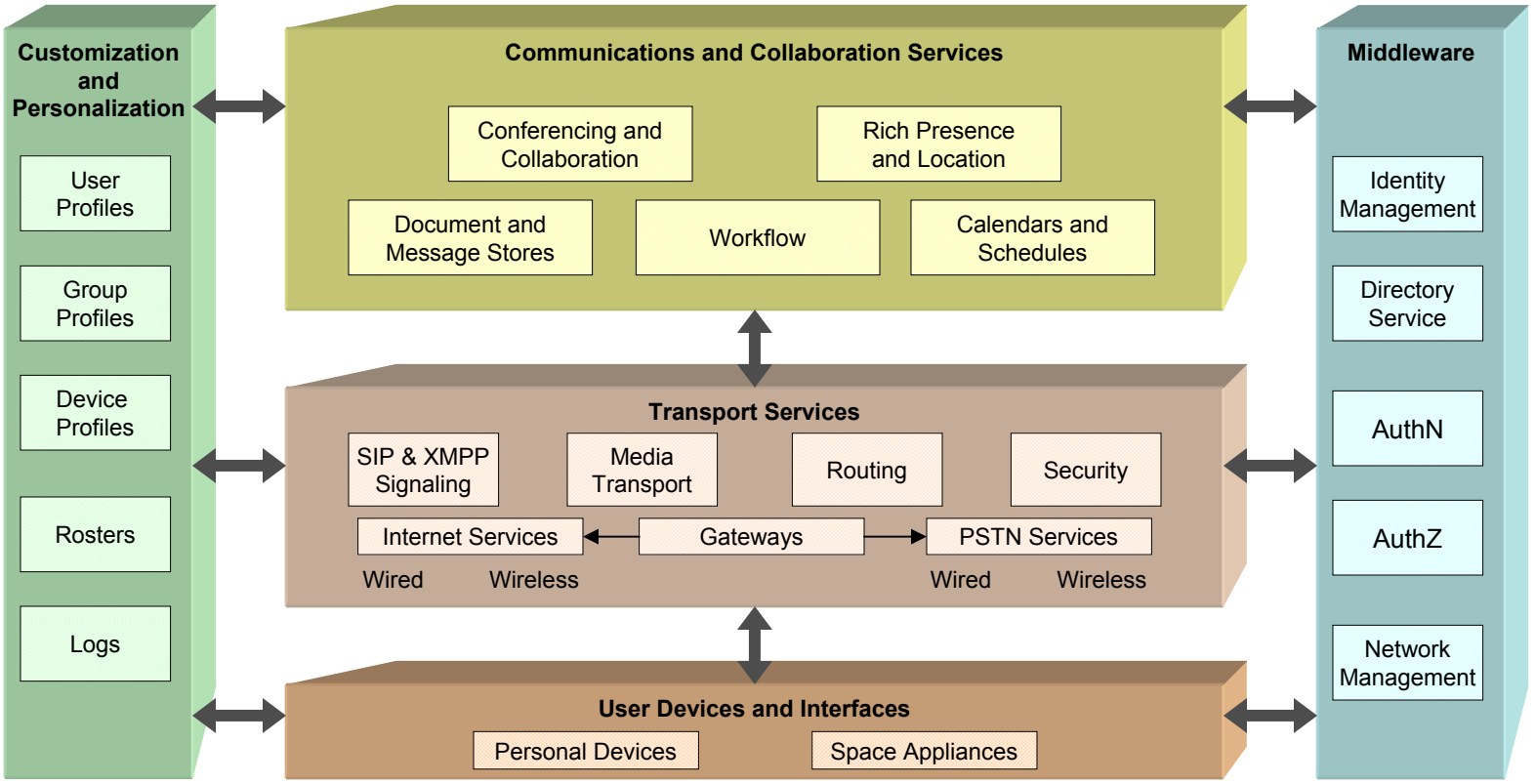
Final Architecture



Telephone and Network Pricing

- Objective – FY08 model to recover costs for network and telephone services which is
  - ✓ simple
  - ✓ transparent
  - ✓ equitable
  - ✓ auditable
  - ✓ with minimal impact on cost recovery
  - ✓ with minimal “winners & losers
- Monthly “Proxy” charge based on employees in departments, labs, and centers
  - – Includes long distance and international calling and remote access
  - – No change in billing for one-time and pass-thru charges
- Proposed annual price increases

Communications Architecture



Communications Strategy



- Integrated access to services from mobile devices
- Identify software clients that support both SIP and XMPP



- Continue to upgrade the network
  - Deploy VLANs
  - Increase redundancy
  - Expand wireless coverage
- Migrate video conferencing to SIP
- SIP Identity for authentication

Communications Strategy (cont.)



- Promote the MIT.EDU communications identity
- Leverage web-based services
- Develop services that leverage location information
- Support for “on the fly” voice conferencing



- Deploy common web-based configuration tools



- Expand support for a single communications identity
- Look to adding Kerberos support for SIP clients
- Enhance network management tools to better support real time communications

The Experimental Campus

- Support experimentation and innovation - large and small
- Provide a set of foundation services for people to build on
- Identify future production services
- Possible large project
  - Use the campus and city as a testbed
  - Not research – but a living lab
  - Engage a broad set of industry partners
  - Build and iterate

Federation Pitch

- SIP.edu
  - SIP connectivity now – don't need to do VoIP
  - Converged identities – email addresses as SIP URIs
- ISN
  - Transition to Internet-style addressing
  - Supports 12-digit keypads
- Jabber / XMPP
  - Converged identities for IM and presence