

NETWORK & TELECOMM

“STATE OF THE UNION”

Agenda

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- **Projects of interest to LSPs**
- **Major N&T projects & initiatives**
- **FY'09 rates**
- **N&T LSP resources**
- **Discussion**

Interest to LSPs

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- Network upgrades -ongoing
- Network rates for FY'09
- Wireless 802.1x (secure W2 client)-June 30
- Email-POBOX to Zimbra conversion-July 28
- VoIP support - ongoing
- IM client – ongoing

Major Projects & Initiatives

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- Next Generation PennNet**
- Public Safety**
- Wireless**
- Email**
- IM**
- VoIP/Voicemail**
- ACDs**
- MAGPI**

Next Generation PennNet

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- Reduce Impact of College Hall Node Room on PennNet Operations
 - Under 25% of PennNet Connections remain
- Deploy gig connections to 110 subnets for capacity by 06/09
 - To date 57 of these subnets have gigabit Ethernet connections.
 - To date 93 buildings have gigabit Ethernet connections
- Deploy dual gig connection for most subnets for redundancy by 06/09
 - 45 buildings with dual connectivity/Expect 65 to 70 by end FY2008
 - Dual gig connections 42 currently
- All closet and building entrance devices upgraded by 06/09
 - 70% of all closet electronics are gig capable.
 - 67 of 93 BE upgraded by end FY2008.

Gig Connected Buildings (Single Feed)

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Bldg. Code	Description	Primary NAP (Uplink)		Bldg. Code	Description	Primary NAP (Uplink)
ACH	Anatomy Chemistry	Modv – Gig		IST	Vagelos Labs	Vag – Gig
BNH	Bennett Hall	Vag – Gig		JAF	Jaffee	Vag – Gig
CHV	3937 Chestnut St.	LEV – Gig		LCD	42 nd & Locust	Schattner - Gig
COM	1920 Commons	HNW Router		LFR	Lauder Fischer	SDH Router – Gig
CPN	Colonial Penn	HNT - Gig		LOG	Logan Hall	Vag – Gig
CST	3820 Locust Walk	HNT - Gig		LSB	Lynch – Life Sciences	Leidy Router
CUT	Nursing LIFE	LEV - Gig		LSH	3643 Locust Walk	CPC Router
DHW	Duhring	Furness Router		LUK/LUS	3706 Locust Walk	HNT - Gig
DUB	Dubois	HNT – Gig		MCA	McNeil Center for Early American 3355 N 34st	Vag - Gig
DUN	Dunning	WTM Router		MCP/MPY	Mod 7 Facility/Murphy	HNT - Gig
FKF	Franklin Field Archives	WTM Router		MED	3508 Market (Science Center Bldg)	MKC Router
FTY	108 S. 40th Street	LEV - Gig		MEY	Meyerson Hall	Vag - Gig
GEB	Graduate Education	HNT - Gig		MKB	3600 Market (Science Center Bldg)	MKC Router
GRE	Greenfield Intercultural	GYM Router		MKK	3700 Market (Science Center Bldg)	MKC Router
HIL	Hill House	Vag – Gig		MLA	Med Labs (John Morgan)	Modv – Gig
HOU	Houston Hall	CHNR – Gig		MSC	Music Building	Vag - Gig
ICA	Institute of Cont. Art	NIC – gig		MSA	Music Annex	Music Router
IRV	Irvine Auditorium	Vag – Gig		MSP	3900 Walnut	GYM Router

Gig Connected Buildings (Single Feed)

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Bldg. Code	Description	Primary NAP (Uplink)		Bldg. Code	Description	Primary NAP (Uplink)
NEW	Newman Center	GYM Router		SAH	St. Anthony's Hall	CPN Router
OVH	Old Vet Hosp	Vet Hospital Router – Gig		THR	3900 Walnut (Greek)	HNW Router
PSY	Psychology Labs	HNT - Gig		WAT	4032 Walnut (Greek)	HNW Router
Quad	Quad Complex	HNT - Gig		WLN	3337 Locust Walk	CPN Router
RAL	Ralston House	NIC - Gig		WMH	3700 Chestnut	GYM Router
ROS	Rosenthal	Vet Hospital Router - Gig		WTM	Weightman Hall	Vag - Gig

Gig Connected Buildings (Dual Feed)

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Building Code	Description	Primary NAP (Uplink)	Secondary NAP (Uplink)
ACC	Annenberg School	Levy – Gig	HNT - Gig
ANB	Annenberg Center	Levy – Gig	HNT - Gig
BLK	Blockley Hall	ModV - Gig	CHNR 100mbps
BRB	Bio-Medical Research Building #1	Modv - Gig	HNT - Gig
BRC	Bio-Medical Research Building #2	Modv - Gig	HNT - Gig
CHM	Chemistry Labs	Vag - Gig	Modv - Gig
CHP	Public Safety 4040	HNT - Gig	LEV - Gig
COL	College Hall	Vag - Gig	Modv - Gig
CRB	Clinical Research Building	Modv - Gig	HNT - Gig
DRL	David Rittenhouse Labs	Vag - Gig	NIC – Gig
ENG	English House	NIC - Gig	HNT – Gig
EVN	Evans Dental	HNT - Gig	SCH – Gig
FBA	Franklin Building Annex	NIC – Gig	Vag – Gig
FKB	Franklin Building	NIC – Gig	Vag – Gig
FUR	Furness Building	Vag - Gig	HNT - Gig
GYM	Gimbel Gym	NIC – Gig	HNT – Gig
HNT	Huntsman Hall	HNT - Gig	Vance – Gig
HNW	Harnwell House	LEV - Gig	Modv- Gig
HRN	High Rise North (Rodin)	LEV - Gig	Modv- Gig

Gig Connected Buildings (Dual Feed)

Building Code	Description	Primary NAP (Uplink)	Secondary NAP (Uplink)
HRS	High Rise South (Harrison)	LEV - Gig	Modv- Gig
HSE	Class of 1925 House	LEV – Gig	Modv – Gig
HSH	Hill Pavillion	LEV - Gig	HNT – Gig
JSN	Johnson Pavilion (Med School)	ModV - Gig	HNT – Gig
KIN	Kings Court	NIC - Gig	HNT – Gig
LDY	Leidy Labs	ModV - Gig	HNT – Gig
LEV	Levy Dental	HNT - Gig	SCH - Gig
MKT	3440 Market St	NIC - Gig	Vag - Gig
NEB	Nursing Education Building	ModV - Gig	HNT - Gig
SCC	Steinberg Conference Center	Huntsman Rtr - Gig	Vance - Gig
SCH	Schattner Building	Lev – Gig	EVN - Router
SDH	Steinberg Hall-Dietrich Hall	Huntsman Router - Gig	Vance - Gig
SEAS/GRW	Graduate Research Wing (Moore School)	Vag - Gig	NIC - Gig
SPE	Sansom Place East (Nichols)	NIC - Gig	HNT - Gig
SPW	Sansom Place West (Grad Tower)	NIC – Gig	HNT - Gig
VAN	Vance Hall	ModV – Gig	Huntsman Rtr – Gig

Gig Connected Buildings (Dual Feed)

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Building Code	Description	Primary NAP (Uplink)	Secondary NAP (Uplink)
VHP	Vet Hospital	VRB Router - Gig	LEV - Gig
VPL	Van Pelt Library	Vag – Gig	Huntsman Rtr - Gig
VPM	Van Pelt Manor	HNT – Gig	LEV - Gig
VRB	Veterinary Medicine Teaching & Research Building	ModV – Gig	Vet Hospital Rtr – Gig
WAL	3401 Walnut St.	NIC - Gig	Vag - Gig
WAL	3401 Walnut St. (computer room)	NIC - Gig	Vag - Gig
WMS	Williams Hall	Vag - Gig	HNT - Gig

Dual Connected Buildings (100/Gig or 100)

Building Code	Description	Primary NAP (Uplink)	Secondary NAP (Uplink)
GEO	Left Bank	Vag100mbps	CHNR 100mbps
MCN	McNeil Building	HNT – Gig	CHNR 100mbps
MKC	Market 3624	NIC – Gig	CHNR 100mbps

Public Safety

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- Security Cameras – We provide infrastructure and support over 150 PS CCTV cameras. This year we added 5 more cameras in the Western end of campus.
 - Cameras and Emergency Phones in progress for three new transit stops (located at UPHS-Gates, Rosenthal, Schattner) vestibules.
- Emergency Phones – We upgraded, manage and monitor 128 self-reporting garage E-phones and will have another 91 Building E-phones upgraded in a few weeks. These new SMART phones proactively improve campus security with automated monitoring & reporting of emergency phone status.
- Elevator phones – Targeting upgrades to all elevator phones (~250). Current PA State Elevator Code affects the upgrades in buildings more than 4 stories high (roughly 50% of these phones). DPS is pursuing a code variance.
- Penn Alert – ISC worked with Public Safety on the Penn Alert system, including working with cellular companies on SMS delays over their network, working with Verizon to insure their network will be able to handle the 15,000 calls in 10 minutes. Campus wide test on 02/29/2008.
- We are in progress of testing and designing a new fire alarm system. ISC may provide fiber infrastructure to diversify the current copper fire alarm infrastructure.

Wireless Update

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- ISC operates 930 APs
 - ▣ Resnet 449 AP's/ Remaining campus 481 APs
 - ▣ SAS/SEAS operate 343 APs
 - ▣ 1273 campus-wide (approximately 60%-65%)
- Since January, all wireless LANs are set up to have access to both AirPennNet (802.1x) and Wireless-PennNet (web intercept)
 - ▣ Permits gradual user conversion to AirPennNet for Schools and Centers
- BlueSocket AuthN Page reconfigured to notify users of changes to Wireless-PennNet
 - ▣ Permits download of SecureW2
 - ▣ Documentation for installing supplicant (for Windows machines) and installation instructions (for MAC's) is posted on Supported Products Page
 - ▣ Informs Blue Socket users that Wireless-PennNet Service is being retired on June 30, 2008.

Wireless Update (continued)

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- New Wireless Network (PennNet Guest)
 - Guest Access to PennNet with a lower barrier to entry and bandwidth limitations (1 Meg max)
 - Testing in Progress
 - NetReg Configuration completed in Feb 2008
 - Wireless Network in 3401 N&T Suites and in TSS March 2008
 - Pilot 2 Customer Locations End March 2008
 - One location to be selected where we have Wireless-PennNet
 - Second Location will be Life Science (Lynch) Lab
 - Anyone interested?
 - First Production Site will be for Destination Penn in Mid May 2008
 - Target Full Production Date (Service everywhere AirPennNet is located, non-residential) by 06/30/2008

Wireless Update (continued)

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- One Common Wireless LAN (AirPennNet)
 - AirSAS to AirPennNet
 - Working with SAS Networking on Inventory of Wireless LANs in all SAS buildings.
 - Approximately 240 AP's will get converted to AirPennNet
 - Target completion by September 1, 2008
 - AirSEAS to AirPennNet
 - 103 AP's across 8 buildings will get converted to AirPennNet
 - Target completion by September 1, 2008

POBOX Classic and Exchange

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- ❑ Pobox Classic: Lower cost email services
- ❑ Pobox Exchange: Integrated email and calendar
- ❑ Both provide spam and virus filtering
- ❑ Both support hosted domains ([user@domain.upenn.edu](#))
- ❑ Both support [user@upenn.edu](#) addressing
- ❑ Both use fully replicated servers and storage
- ❑ Both are monitored around the clock. Reports at <http://status.net.isc.upenn.edu>

POBOX Exchange Service

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- Pobox Exchange
 - Integrated email and calendar for Outlook and Entourage users, with web access available
 - Launched summer 2007
 - 2306 users/173 with PDAs
 - Details at <http://www.upenn.edu/computing/email/exchange/>
- Upcoming Changes
 - Exchange Account Management: BlackBerry self-service (March 2008)
 - Enable account
 - Delete account
 - Set activation password
 - Send service book
 - Remote wipe

POBOX Classic

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- Service “born” in 1993
- Other large mail services hosted on POBOX since 1999
- Service provided to about 13,000 users today
- Electronic Mail -
 - ▣ POP & IMAP (Thunderbird, Outlook, Apple Mail supported)
 - ▣ Legacy host-based email (Pine, Mutt)
- Unix shell access, mailing lists, personal web pages and student group accounts

Phasing out by June 2008.

Alternative is the for-fee Listserv service, which includes more list options, and a web-based interface to manage the lists. We have resources to help transition people away from services being phased out.

- Next-Gen Pobox Classic - based on Zimbra collaboration suite. *Rolling out late summer 2008.*

NextGen Pobox Classic - Zimbra

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- Email (webmail, POP/IMAP)
- Calendar (+ free/busy sharing w/Exchange)
 - ▣ ISC will likely phase out its Meeting Maker service by end of 2008.
- Address book
- Tasks
- Integration via browser or Zimbra client
- Document sharing
- Instant Messaging
- PDA support
- Planned Timeline:
 - ▣ May 15, 2008: customer pilot
 - ▣ July 28, 2008: production service
- End user cost for Pobox Classic NG at FY'08 rates

Jabber IM services

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- Pilot began January 2007. Production Date: July 2008.
- Over 15,000 accounts. Most still don't know they have them.
- Accounts at no additional charge for ISC email and VoIP customers.
 - \$12/year if not, starting in FY '10
- Currently have 150 simultaneous users daily (about 500 total users)
- Facilitates collaboration among co-workers, even those offsite
- Most clients in common use can simultaneously connect to AIM and/or Yahoo Messenger as well as Penn's IM service
- Group Chats
 - Persistent "chat rooms" (like SUG, MacNet, PCNet, etc)
 - Ad Hoc group chats - great for quick communications and troubleshooting sessions

Jabber IM Next Steps

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- Formal evaluation team of IM clients in Spring
- Currently investigating integration with the Asterisk voice mail system and with Zimbra
- Upcoming availability of Kerberos authentication for compatible clients (including iChat)
- Testing and possible piloting of mobile clients for Palm, BlackBerry, iPhone, and Windows Mobile

VoIP & Voicemail

- We have about 1 500 PennNet phones in service.
- We continued to work aggressively to solve several issues including: porting numbers, some feature problems (too many rings before voicemail, remaining consultative transfer calls, etc.)
- We have slowed the deployment of PennNet phone and our IP-based voicemail, while we evaluate an outsourced alternative from Verizon, called HIPC (Hosted IP Centrex)
- The HIPC ISC pilot should be started in March.
- We will compare advantages, disadvantages and costs and decide by June 1 if we go 100% with either one or a combination of both.
- We anticipate doing 1 500 additional phones in FY '09 and finishing the conversion to all VoIP by FY '12.

ACDs (IP-based call centers)

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- Penn has three legacy ACDs and about 200 agents.
- ISC purchased an ACD from ININ and is migrating all of the legacy systems to one centrally run (and highly available) IP-based system.
 - In addition to telephone calls, ACD also routes email, web chat and inbound fax requests to agents. The service includes reporting services that measure the performance of the Call Center configuration (# of calls, emails, web chats, missed calls) as well as the performance of the Call Center Agents (most calls, fewest calls).
- The rollout commenced on January 29th and is expected to be completed by August 15, 2008. Additional information is available at www.upenn.edu/computing/voice/acd.
- Deploying across the campus community to the following schools/centers: Student Health, VHUP, Facilities, Computer Connection, Student Registration and Financial Services, Dental School, Wharton MBA, Undergraduate Admissions, Office of International Programs, Ben HELPS, Penn Behavioral Health and ISC ProDesk.

MAGPI

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- The Penn community will save \$400k in FY '08 by ISC's operation of the Internet2 GigaPoP, MAGPI.
- MAGPI has several lines of business including: Internet, Internet2, co-location services in 401 N. Broad, application development, and videoconferencing.
- We may soon be offering “wavelengths” in 1 Gbps, 2.5 Gbps, and 10 Gbps from MAGPI to any Internet2 connected site in the U.S. and select sites in Europe and Asia.
- NLR connectivity could be available if MAGPI members are interested. Currently National Oceanic and Atmospheric Administration (NOAA) and the Dept. of Energy (Esnet) have inquired about access.
- MAGPI services may be useful if anyone in your departments is doing high-end, collaborative research.

MAGPI Projects

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- Penn Museum and Digital Corinth – Working on Phase II of an existing NEH grant co-authored by MAGPI and David Romano, Ph.D. to combine digital collections at Penn and the American School of Classical Studies in Athens. The focus is on the ancient city of Corinth where students, educators, and researchers will interact with the synchronized data.
- Princeton University, ESnet, NOAA – MAGPI will provide a 10 Gigabit per second static wavelength with access to Department of Energy and National Oceanic and Atmospheric Administration (NOAA) collaborators.
- Penn School of Medicine/UPHS – MAGPI co-sponsored an event with SOM & UPHS that demonstrated the value of high performance connectivity in support of the Penn Global Health Programs. MAGPI and Internet2 provide access to 87 national networks around the world.
- Wharton/Lauder Institute – MAGPI's first program was with the Lauder Institute, involving a simulation exercise between Penn students and the University of Grenoble, France. Current projects involve France, Chile, and Senegal.
- Graduate School of Education – MAGPI is a partner on a grant submission involving the Penn Literacy Network and distance education, national and international.

Rates (Telephone)

Voice Rates (month)	Cenntrex	VoIP FY 2008	VoIP FY 2009
Centrex line/VOIP line	\$15.60	\$15.32	\$15.32
Phone Set w/maint.	\$10.03	\$8.00	\$3.00 - \$6.00
Voicemail	\$9.75	\$3.00	\$3.00
Port	\$0.00	\$6.03	\$6.03
subtotal	\$35.38	\$32.35	\$27.35-\$30.35
Usage			
Local (\$0.06/call)	\$3.00	\$1.50	\$1.50
Long Distance (\$.10/min)	\$3.00	\$1.50	\$1.50
TOTAL	\$41.38	\$35.35	\$30.35 - \$33.35
Conversions	N/A	\$80 waived	\$80 waived

Rates (Network)

<u>Data Rates</u>	<u>FY 2008</u>	<u>FY 2009</u>
Per IP Address Fee	\$7.45/month	\$4.29/month
Port Rental and Connection Maintenance Fee		
10Base-T	\$6.03/month	\$6.03/month
100Base-T	\$7.03/month	\$7.03/month
1000Base-T	\$30.00/month	\$30.00/month
Wireless Local Area Networks		
Monthly Fee	\$27 per AP/month	\$26 per AP/month

Rates (Email)

<u>E-mail Services</u>	<u>FY 2008</u>	<u>FY 2009</u>
Classic Pobox Account - Basic Authentication Security	\$3.50/month	Not available
Classic Pobox Account - Enhanced Authentication Security (Kerberos)	\$3.00/month	Not available
Next Generation Pobox - Zimbra - Basic Authentication Security	Not available	\$3.50/month
Next Generation Pobox - Zimbra - Enhanced Authentication Security	Not available	\$3.00/month
POBOX Forward only	Not available	\$1.50/month
Microsoft Exchange 2007 with integrated calendaring	\$7.50/month	\$7.50/month
Wireless PDA sync (Blackberry or non-EAS Palm)	\$13.50/month	\$13.50/month

N&T Resources

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- Network Upgrades
 - <http://www.upenn.edu/computing/pennnet/maintschedule.html>
- Pobox Classic and Exchange
 - ▣ <http://status.net.isc.upenn.edu>
 - ▣ <http://www.upenn.edu/computing/email/>
 - ▣ <http://www.upenn.edu/computing/email/exchange/>
- ACD
 - ▣ www.upenn.edu/computing/voice/acd
- Rates
 - ▣ www.upenn.edu/computing/isc/networking/rates/

Discussion