



Infrastructure Services Infrastructure Fact Sheet

Updated: September 2009

Loyola University Chicago has established two primary data centers. One is located in downtown Chicago, at our Water Tower Campus. The second is nine miles north, in Rogers Park at our Lake Shore Campus. Today, these centers are the University's information hubs. As we expand into the future, our continued design focus is on business continuity requirements. We stress redundancy at all levels: equipment, network, electricity, and connectivity. For more specific information regarding Loyola's data centers, see the data center fact sheet on the reverse of this document.

Network

Cisco is our primary vendor for network devices. We have 65XX switches at the data center core of each campus, supporting around over 20,000 switched ports (10/100/1000) throughout our two main campuses.

Metropolitan Area Network (MAN)

Leased ATT fiber joins the two Lakeside campuses and our Medical Center with 1 GB Ethernet connectivity. A triangular format provides for redundancy.

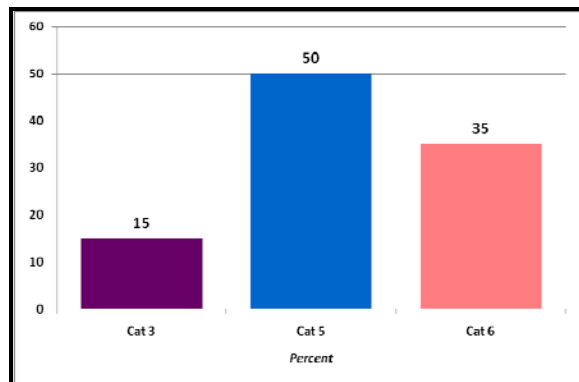
Campus Wiring

Loyola's campus wiring consists of multimode fiber and copper trunk cabling to all contiguous buildings, and to 99% of the telecom closets within those buildings. Non-contiguous locations are served by either wireless links or leased circuits. Single Mode Fiber is being installed as opportunities are presented throughout the campuses.

Station Cabling

Our standard configuration provides for administrative spaces to have one voice and two data cables. For residences, the standard is a minimum of one voice cable per apartment and one data cable per pillow.

- Cat-3 in the older buildings (10 MB speed)
- Cat-5 in majority of buildings (100 MB speed)
- Cat-6 for new construction and renovations (1 GB with 10 GB possible)



Internet Access

Internet access for student residences, as well as administrative and teaching locations, are provided with a 100 MB link for Water Tower Campus, provided by ATT Communications, and a 100 MB link at the Lake Shore Campus provided by ICN. Each link is utilized as a backup to the other in the event of an outage.

Internet 2 (I2)

Loyola is an active member of the I2 consortium. We connect to I2 through the Gigapop at Northwestern University (710 N. Lake Shore Drive). Connectivity is at 1 GB.

Residential Cable Television

Students are provided with basic cable television in each of the residence hall rooms. Currently, there are approximately 1,900 connections active through our bulk agreement with Comcast. Premium services are available at the student's expense.

Wireless Network

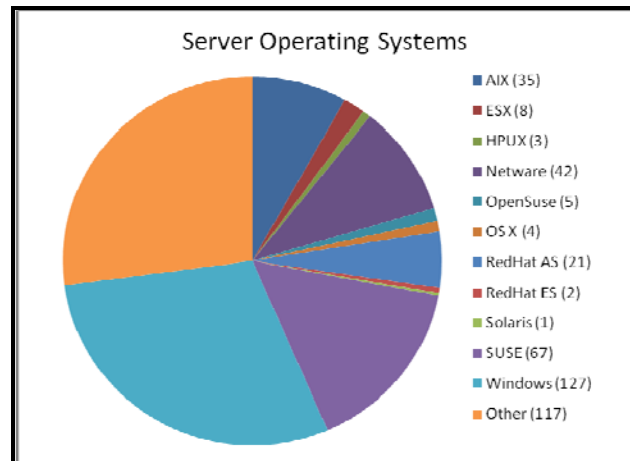
The implementation of wireless is being deployed in a logical manner with consideration to value and need. To date, we use wireless only to augment our wired network. However, in new construction we install copper to the desktop along with wireless capability. We secure our wireless via a registration and authentication system (Loyola- NETREG).

Currently, we have approximately 800 Cisco APs spread out primarily in residence halls, classrooms, and common student areas supporting 802.11 A/B/G with new implementations incorporating 802.11N technology.

Loyola Hot Spots can be found at: www.luc.edu/is/wireless

Servers

The Loyola University Server environment consists of 168 physical Server Class machines and 135 virtual servers running VM Ware on 8 physical machines. A majority of these machines are running on IBM server hardware. Seventy-nine of these servers are located at the Water Tower Campus; 232 are at the Lake Shore Campus.



Storage & Backups

We currently have 74 Terabytes of online storage in our data centers. This storage is accessed by directly-attached SCSI devices, and through three fiber-channel storage area networks (SANs). The Water Tower SAN is an IBM DS4500 providing 20 Terabytes of storage. The primary Lake Shore SAN consists of an IBM DS4500 and an IBM DS4800 providing 38 Terabytes of storage. A third SAN located at LSC is an IBM DS4700 with 16 Terabytes of storage used by campus Safety for video capture. All SANs connect to our core via 2 GB per port or 4 GB per port fabric switches.

Two servers running Tivoli Storage Manager (TSM) safeguard data from corruption, disaster, and accidental deletion. Each TSM connects to an IBM 3584 robotic tape library. Each day, these libraries perform hundreds of automated operations.

Telephony

The campus voice environment consists of two AVAYA voice systems. A Definity G3r is located in our Water Tower data center at 25 E. Pearson, and an AVAYA Communication Manager 4.0 is located in the Dumbach Hall data center at Lake Shore. The Water Tower G3r consists of 6 expansion port networks servicing 1,833 active telephone ports. The Lake Shore CM 4.0 consists of 12 port networks (23 G650s located in Dumbach Hall and 6 traditional cabinets located through the campus) servicing 3,629 active telephone ports. The CM 4.0 utilizes IP telephony as its backbone and supports VOIP to the desktop.

Our voicemail system is a single AVAYA Intuity Audix system located at the Lake Shore Campus. We have a maximum of 3,200 mailboxes and 48 simultaneous sessions on this system.

Intra-campus calls are carried on three AT&T ISDN/PRI T1s for tie lines between Lake Shore and Water Tower. There is also one AT&T ISDN/PRI between Lake Shore and the Medical Center and one AT&T ISDN/PRI between Water Tower and the Medical Center. On average, Loyola University Chicago places 72,000 outbound calls monthly (45,500 at Lake Shore and 26,500 at Water Tower).

E-mail Systems

The current faculty/staff/student email system is GroupWise 7.0.

Loyola receives over 800,000 e-mail messages per day to our MailFoundry anti spam/virus system. Of these:

- 79% are blocked due to high spam score or block listing
- 19% are allowed through as clean (not spam, not virus)
- 2% are blocked because of viruses

Refresh Programs

Loyola has four refresh programs in place today:

- Workstations are refreshed on a four- to five-year cycle
- Servers are refreshed on a four-year cycle
- Network switches are refreshed on a five-year cycle
- Electronic classroom are refreshed on an eight-year cycle

Desktop

95% of the workstations in our environment are Dell PCs running Windows XP Professional SP2. About 2,650 of them are faculty or staff workstations and 1,050 are public-access machines in labs, classrooms, libraries and dorms. We have a standard model Dell workstation and a standard laptop configuration. These hardware models stay consistent for 15 to 18 months, which simplifies support and management through a single image. The lab image is updated three times per year and the faculty and staff image is generally updated twice a year.

We have 255 Macs. 205 are in public access areas and 50 are faculty or staff machines running OSX. We try to follow a general standard configuration, but Apple does not provide the same hardware consistency in the Mac.

Data Center Facts		
	Dumbach Data Center	25 East Pearson Data Center
Space	<ul style="list-style-type: none"> • ~2150 sq ft 	<ul style="list-style-type: none"> • ~1607 sq ft
Power	<ul style="list-style-type: none"> • 225 KVA UPS • Three commercial feeds • TVSS (transient voltage surge suppressor) on each feed • Data-center-grade emergency generator • Dual power distribution units (PDUs) to each rack • Dual three-phase 208VAC 60A circuits to each rack 	<ul style="list-style-type: none"> • 65 KVA UPS • Two commercial feeds • Emergency generator • Dual single-phase 120 VAC 20A circuits to each rack
Air Conditioning	<ul style="list-style-type: none"> • Six CRAH (computer room air handler) units totaling 142 tons connected to three chillers and fed with three circulating pumps 	<ul style="list-style-type: none"> • Two CRAC (computer room air conditioning) units totaling 20 tons connected to building cooling system
Fire Suppression	<ul style="list-style-type: none"> • FM200 gas suppression system 	<ul style="list-style-type: none"> • Building sprinkler system
Security, Surveillance & Monitoring	<ul style="list-style-type: none"> • Key-card access on all doors • Surveillance cameras internal and external to space • Recorded and remotely accessible • Delta system – environmental • Fire • Chillers, pumps, CRAH • Water detection • Power source (feed, transformer, generator) • Remotely accessible and enunciator panel • Netbotz – environmental and surveillance 	<ul style="list-style-type: none"> • Key-card access on all doors • Chillers, pumps, CRAC • Water detection • Power source (feed, transformer, generator) • Netbotz – environmental and surveillance
Cabling	<ul style="list-style-type: none"> • 24 Cat6A cables back to central core for network and remote management • 12 strands of 50 Micron fiber back to central location • 12 Cat6 cables for KVM (keyboard, video, monitor) unit, cross-connected to central location • Both fiber and copper capable of running 10 GB <p><i>In total we have 37.8 miles of copper and 18.7 miles of fiber running within the data center!</i></p>	<ul style="list-style-type: none"> • 24 Cat5E back to central core for network and remote management • Copper cabling capable of 1GB