FERRIS STATE UNIVERSITY

INFORMATION TECHNOLOGY SERVICES

University Plan for IT

Network Infrastructure Enhancements

Increase Internet Bandwidth

Upgrade Network Infrastructure

Improve Wireless in Academic Buildings

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Introduction:

The University Plan for IT includes multiple network infrastructure initiatives over a three year period. These initiatives are designed to improve bandwidth capacity and accessibility with a focus on academics. The document provides a summary, scope and plan for initiatives number 4 "Increase Internet Bandwidth", 12 "Upgrade Network Infrastructure", and 13 "Wireless in Academic Buildings" in the University Plan for IT.

Summary of the Project:

The network infrastructure improvements will be for both "wired" and "wireless" data network services available to the campus community. Faculty, staff and student desire for "additional bandwidth" on the University network was one of the primary driving factors for these initiatives. Another factor was the interest in expanding the existing "general coverage" wireless network currently available in all campus buildings to a more robust system focused in academic spaces. This wireless effort included reviewing such "academic spaces", primarily classrooms, which would benefit from additional wireless capabilities to be used by professors and students to enhance the teaching and learning experience. The focus of these enhancements would be on the purchase and installation of additional network components and wireless antennas to meet the requests of the campus community in both a "wired" and "wireless" environment.

Funding sources have been established, approved, and scheduled for use over the next three years to make these enhancements a reality. Starting in the fall semester of 2012 and continuing through the spring semester of 2015, network upgrades will take place and new wireless installations will commence to provide the "additional bandwidth" requested by the University community. Installing these new components will align the network services available with the increased demand for mobile communication and classroom technology needs.

Project Scope:

The scope for this project includes the design, purchase, configuration and installation of additional network switches, routers, software, and wireless antennas in an effort to enhance the University "network access" experience. The internet and Ferris backbone network links between core routers will be upgraded from 1Gb to 10Gb, new network switches will provide faster connectivity to Smart Classroom technology, and new/additional wireless antennas will provide 802.11n, (300Mbit) connectivity speeds for wireless users currently connecting at 54Mbit. Deploying these components keeps Ferris State current with the most recent technology trends and offers students and staff faster, more reliable, and more robust connectivity options.

Project Plan:

Buildings currently included in this three-year plan include: Ferris Library for Information and Technical Education (FLITE), Swan (SWN), Science (SCI), Pharmacy (PHA), Interdisciplinary Resource Center (IRC), Business Building (BUS), National Elastomer Center (NEC), Allied Health Center (VFS), Starr (STR), Automotive Center (AUT), Granger Center for Construction Management and HVACR (GRN), Alumni building (ALU), and the Heavy Equipment Building (HEC). These buildings are included in the plan because they house approximately 95% of all on campus classes.

Buildings that contain "classroom spaces" but are NOT included in this plan: Prakken(PRK), Creative Arts Center(CAC), Johnson hall (JOH), Student Recreation Center(SRC), Music Building(MUS), Southwest Commons(SWC), Arts and Science Commons(ASC), West Commons(WCO), Williams Auditorium(WIL), Racquet and Fitness Center(RQT), Sports Complex(SPO), and Katke(KAT). These buildings are not included at this time because they have 3 or less classroom spaces that are currently utilizing minimal network and wireless bandwidth in a teaching environment. Recommendations on considering these and other on campus facilities for upgrades will be reviewed in three years.

Upgrade/Enhancement Priority for buildings that ARE INCLUDED in this plan will be based on four primary factors:

1. **Buildings that presently have the most dated network equipment.**
2. **Buildings that host the majority of "on campus" classes. (Classroom use/building data taken from recently completed VOIP classroom deployment project 2009-2012).**
3. **Technicians ability to physically complete upgrades/enhancements in time-frame given without disturbing building and classroom function.**
4. **Demands/use of existing wireless systems based on reports collected from existing wireless controllers.**

The project plan includes specific steps for completing each building.

1. Identify classroom spaces and collect use/need data.
2. Determine number of wireless antennas needed and their location for each classroom space. Plan currently includes design based on: (1 antenna for every 15 seats in a classroom).
3. Design network upgrades / enhancement for each building based on additional number of antennas needed/building need.
4. Purchase, configure, and install network upgrade components.

5. Install any additional wiring for new wireless antennas.
6. Install and test new wireless antennas while continuing to monitor and adjust antenna coverage as needed.
7. Spare wiring will be installed as well throughout all facilities to address potential future needs.

Year 1: 7/1/2012-6/30/2013 [FLITE, SWN (53 Classrooms), SCI (42 Classrooms), PHA (10 Classrooms), IRC (23 Classrooms)]

Year 1 of this project is already underway; 802.11n wireless was deployed in FLITE just before the start of the 2012/2013 school year due to the identified need in that facility. FLITE's previous wireless network was a dated system and historical complaints from students during the 2011-2012 school year deemed an immediate replacement necessary. Wireless enhancement design data is being collected for Swan and Science. Existing network services and wireless use are being reviewed in Pharmacy and IRC. Network upgrades and enhancements for SWN, SCI, PHA, and IRC will be completed between now and June 30th 2013 for enhanced wireless deployment in those facilities starting in July 2013. (Note: Due to student need, work has commenced on phase1. Working ahead of the outlined schedule may allow some building's to be completed ahead of this written schedule!)

Network Upgrades

- Deploy 10 Gb to Internet…in progress
- Deploy 10 Gb across Core Routers (ASC, VFS, WES, FLT)…in progress
- SWN
- SCI…in progress
- PHA…complete
- IRC…in progress

Wireless Enhancement Designs

- SWN…complete
- SCI…complete
- PHA…complete
- IRC…complete

Wireless Enhancements

- IRC…complete

- PHR…complete
- SCI…in progress
- SWN

Year 2: 7/1/2013-6/30/2014 [BUS (35 Classrooms), STR (40 Classrooms), VFS (21 Classrooms), NEC (15 Classrooms)]

Year two includes the completion/installation of the actual wireless enhancements from the designs created Year 1, (the intent/hope is to start year 1 fiscal year '12-'13 if possible). It also includes working forward on Network upgrades and wireless designs for Year 3.

Network Upgrades

- Deploy 10 Gb across building links where need is identified once core data has been collected.
- Upgrade necessary core equipment components including but not limited to (Wireless Controllers, Firewalls, Bradford)
- Add 10Gig switch capability to BUS, STR, VFS, NEC,BIS

Wireless Enhancement Designs

- BUS
- STR
- VFS
- NEC

Wireless Enhancements

- SWN
- BUS
- VFS
- NEC

Year 3: 7/1/2014-6/30/2015 [AUT (27 Classrooms), GRN (18 Classrooms), ALU (5 Classrooms), HEC (10 Classrooms), BIS (12 Classrooms), MCO (20 Classrooms)]

Network Upgrades

- AUT
- GRN
- ALU
- HEC
- BIS
- MCO

Wireless Enhancements

- AUT
- GRN
- ALU
- HEC
- BIS
- MCO

Considerations Pending:

Upgrades to non-academic facilities evaluated and completed following the completion of this project.