Networks Tactical Plan

Current Network Services

Infrastructure

- Internet and Campus Connectivity: IT manages the UNM main campus network and provides access to the internet for UNM Branches, hospitals and clinics. Wired network services include high-speed internet connections to classroom buildings, branch campuses, researchers, and residence halls. Voice and video are transmitted on the same network in some cases. The wireless network was redesigned and upgraded in 2012, and continues to be improved as funding is available. Network Services also provides low-voltage cabling infrastructure to support UNM capital projects, and to enable the delivery of IT services.

Communication & Collaboration

- Telephone Services: Voice services are provided to main campus, the HSC, University Hospital and clinics, as well as branch campuses and on University agencies. Telephone services include a suite of technology for analog, digital and Voice over IP (VoIP) phone services, including Telephones, carrier support, voice mail, voice mail Automated Attendants, conference calling, Interactive Voice Response (IVR) and Automatic Call Distribution (ACD) – call center functionality. We also support Emergency 911, code blue, elevator, ring down notification systems.

Security & Privacy

- Electronic Security & Alarm Services: IT installs, maintains, and provides 24 hour functionality monitoring for Intrusion Alarm systems (keypad/code operated- burglar, hold up, and panic alarm); Special Condition Alarm (flood, liquid level, freezer, temperature, maintenance alert notification); and CCTV Systems (Closed Circuit IP "camera" systems).

Current Work and Issues Related to Existing Services

UNM relies on the availability and security of the UNM campus data and voice infrastructure and services for almost every academic and administrative function. Network-delivered services and network-dependent devices are growing exponentially, as is the traffic that rides on the network supported by IT. In a common trend across all departments within IT, the network has absorbed much of the business transaction services.

Various issues challenge Network services delivery. First and foremost, service request volume is high. The daily growth of IP hosts increases the number of requests, while human resources are limited and projects absorb a substantial amount of staff hours. It certainly is a challenge for IT to compete with market-rate salaries to hire and maintain highly qualified network engineers and technicians. Much of the campus infrastructure is old, slow, not to code, and will soon reach end-of-life, which causes a revolving door issue with service requests. Since current funding models do not support all services, revenue-generating services, such as telephones, subsidizes other I&G-funded services. This hinders the ability to re-invest in telephones, and stand up or sustain other services or products. Finally, resource constraints further
compound the challenges. Funding is scarce for such items as training, transportation (service vehicles) and upgrades.

Network costs are recovered by a subset of fee-based services. This means that paying customers requesting a new service receive faster attention than a student, faculty or administrator using the network without making a financial contribution. This is not the best model for an enterprise operation, but the model drives the operation.

**Wired Data Network:** In FY13, a major network redesign effort was initiated. The effort was re-energized in FY15 and is currently in the beginning stages. Work to complete the implementation of this design will bring UNM up to 21st century standards and replace non-standard equipment in the IT Data Center and in buildings across campus. Groundwork has been laid to separate the production network from researchers and to provide more flexible logical separations to accommodate other end-user requirements. Hiding IP numbers and migrating to Internet Protocol version 6 (IPv6) is also part of this roadmap.

**Wireless:** The wireless network continues to expand as funding becomes available. Currently, the 3,100+ Access Points (APs) on main campus and in residence halls are in high demand. LoboGuest service and availability is being revisited as UNM demand has increased.

**Telephone:** Through the convergence of technologies, voice services are now offered over the data network (Voice over IP, or VoIP). IT is in the process of defining, both technically and from an end-user viewpoint, a new unified communications service.

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**Vision and Approach for Network Services and Design**

**Vision:** Deploy fully integrated data/voice and unified communications services distributed via a robust cabling infrastructure that is secure, available, reliable, and sustainable in order to increase efficiency.

**Approach:** The following steps are moving UNM Networks toward accomplishing its vision while increasing the scale of the UNM network:

- Realize continued increases in efficiencies while decreasing costs in all services
- Implement charges for existing services that currently are provided at no cost, e.g. charge fees for:
  - Non-UNM entities using the campus data network; and
  - Electronic Security & Alarms customers;
  - Promote Just-in-Time ordering (material for voice) to decrease overhead
- Increase sales to external and UNM-paying customers:
  - Increase ABQG customers by 10% or $89,000
  - Increase voice revenue by 2% ($8M in revenue, $7.5M in expense)
  - Levy surcharges on cable and fiber work for internal, HSC and external customers
- Use increases in sales to external customers to cover
  - Staffing increases
  - Fiber upgrades
  - Network Redesign and implementation
  - Implement new cost model to cover services
  - Refresh and renew unified communications application (MS Lync), SIP based end devices – non proprietary
- Seek external funding to meet research networking requirements (e.g. NSF, USDA)
- Deliver fully converged voice and data network
12-24 Month Milestones

Internet & Campus Connectivity
Fall 2015: Design and Upgrade Intensive Compute Node Network – IT Data Center
• Proof of Concept for moving to pure VoIP via handsets
• Collapse nodes and aggregate switches.
• Migrate to logical segmenting of the network to establish a DMZ for types of use, such as network research or external entity.
• Design Science DMZ implementation roadmap and roll out pilot location.
• Phase I of Fiber Replacement (Centennial)
• Move UNM West to Zayo Fiber and disconnect Time Warner Telecom (TWTC) Level 3 service
• Plan the Taos branch infrastructure upgrade.
• Begin Phase 1 of 10 Worst Wireless Buildings Project
• Begin the 2-3 year edge switch refresh process
Spring 2016: Select location (pilot) for private IP space for wired IPs.
Spring 2017: Move to private IP space for security and simplicity for dynamic and permanent wireless IPs,
• Move the Network Address Translator (NAT) to Palo Altos

Network Fiber & Cable
Fall 2015: Taos Student Success Center Klauer Campus, addition to Martinez Hall at Klauer
• Clark Hall Chemistry, remodeling and upgrading classrooms in Reibsomer Hall
• Science & Math Learning Center (SMLC) Addition
• UNM West Fiber Build
• Athletic Cable Plant Rebuild
• ECE to Centennial Fiber Rebuild
Spring 2016: Spring, 2016: Fiber/Copper Rebuild to Lands West
Fall 2016: Main Campus Optical Fiber Redesign, dependent upon Network Redesign
• Taos Rio Grande Hall
• Farris Engineering Renovation
• Sevilleta Fiber Repair/Remediation
• Science and Technology Park Cable Plant Rebuild
• Taos Network Infrastructure, standard backbone to Edge Switch connection at Klauer Campus

Telephone Services
Fall 2015: Continued projects from UH-HSC on new technologies – Sandoval Regional, Cisco VoIP Integration
• Develop strategies for VoIP technologies to reduce reliance on aging Telecomm Switch
• Migration of Authorization codes to the cloud
• Standing up e-Fax service (FoIP)
• NEC contract extend to 2020 (current ends in 2018 – in progress)
Winter 2016: E911 system upgrade (End of life, End of support past) UNM Campus Police ($500K—pending funds—NM Funding unavailable)
• Enterprise Cellular Coverage Support Model— in progress (2-5 year project)
Spring 2016: Spring 2016: Guardian Implementation

Electronic Security & Alarm Services
This is a time and material service funded by Building Renewal & Replacement (BR&R) and I&G.
• Fire alarm repairs (foremost priorities)
• Intrusion alarm, panic, etc. upgrades, installations and repairs
• CCTV – camera systems, upgrades, installations and repairs
• Fire alarm inspections by Safety & Risk Services (SRS) and repairs prioritized by Fire Marshall

**Proposed projects for additional funding in 2015-16 cycle**
• Upgrade PPD – police station to IP based to cut down on travel for overtime and support: $152,000
• Migrate Fire alarm panels to IP connectivity to eliminate analog dial tone: $700,000
• Consider the CCTV to a hosted solution: $500,000 - or move to Computer Coordinated Universal Retrieval Entry (CCURE) instead.
• Stand up a Mobile Router and Control (MRC) for Alarm system and intrusion: $19.00/ alarm point