

ITS Strategic Roadmap – FY16

Network Infrastructure

Author: *Jesse Turner*

Date last updated: 1/15/15

Background

The Network infrastructure is defined as the communications components that make up and support the reliable transmission of voice (telephone) and data services between all of the Metro facilities throughout Davidson County as well as supporting connectivity for outside entities such as the Internet, business partners and third party entities. These components include routers, switches, wireless devices, firewalls and other gear. According to a 2013 study by Gartner, the demand for network bandwidth is currently increasing at an annual average growth rate of 50%.

Due to the criticality of the network infrastructure, the potential for security compromise via the network and to take advantages of economies of scale, as a matter of policy the ownership and management of the network and its components were consolidated in the Purcell administration for all Metro general government agencies, Davidson County Sheriff's Office, and the judicial community. Exceptions to this are the District Attorney's Office and the Metro Nashville Public Schools.

Technologies are standardized upon Cisco Systems. Cisco has proven to deliver consistent interoperability, scalability and management tools which enables Metro ITS to deliver the reliability and service required to serve its customers.

Primary stakeholders include the department of General Services who manages the construction of maintenance of the Metro general government's facilities; major vendor partners including AT&T, XO and Comcast; and the Metro departments and agencies and their citizen customers.

Current Strategic Drivers

1. **Continuing Demand for Metro Construction Projects** (Game changing) – Presently the ITS department supports IT services within the general government in 265 separate locations. The drive for new facilities and upgrades to existing facilities continues, though there is uncertainty associated with the priorities of a new administration.
2. **End of Life Hardware** (High) – Typically per defined schedule hardware vendors discontinue support on selected models of equipment. Replacing EOL equipment ensures Metro's ability to obtain support and deliver new services.
3. **End of Life Technology: SONET** (High) – The SONET technology that has provided the backbone of the Metro network has been declared end of life. A project continues to replace that technology.
4. **Cloud Services** (High) – The widespread public acceptance of cloud for services that employees and citizens use every day, along with the potential for positive financial impact and increasingly effective cloud vendor security stance make a hybrid model a potential direction. Plans are underway for trials of Microsoft 365 and the hosting of Civic Brigade.
5. **Challenges with Network Management in a Growing Environment** (High) – As the amount of network infrastructure increases, the complexity of the network and its management challenges



increases as well.

6. **Demand for Secure Government Systems** (High) - With massive data breaches in the news on seemingly a daily basis, we must strive at all times to protect the security, availability and integrity of all facilities and systems entrusted to our management.
7. **Expectation for Ubiquitous Wireless Coverage** (Medium) – In a world where every fast food restaurant offers free Wi-Fi at some level, there is an expectation among workers and citizens for complete coverage for Metro internal Wi-Fi as well as free public Wi-Fi. These expectations must be applied against available budget and resources.
8. **Internet Access** (High) – The dependency on Internet access has grown beyond standard Internet browsing into the defacto standard transportation mechanism for system and personal communications.
9. **Demand for Video** (High) – The general growth in use in video among the general population, thus the Metro employee population, and multiple large scale Public Safety projects has increased the demand.
10. **Disaster Recovery** (High) – Considering that connectivity is the basis of both disaster remediation and business recovery activities, as seen in the 2010 Nashville flood, a focus on disaster recovery readiness is critical.
11. **Contract and Purchasing** (Medium) – Many of the traditional Telco products used for delivering communications services are reaching EOL as newer technology is deployed in the Providers networks. This enables Metro to take advantage of the competitive market for these services.

On the Horizon Strategic Drivers

1. **Internet Protocol v6** (Low) – The growth of the Internet has put a strain on the available Internet Protocol (IP) addresses for connecting to the Internet. New addressing standards have been created to address this shortage. Metro will continue to use the IPv4 standard internally.

Short Term Goals (0-6 months) 7/1/15 – 12/31/15

#	Goal/Objective	Est. Start	Est. Duration
1	Replace End of Life (Effective 2015) network hardware - List of hardware has been compiled and under review by Enterprise Architect for selection of replacement hardware. (Capital Funding will be required)	7/2015	12 Months
2	Network Management – Review current network management processes and identify new areas of focus including capacity management as well as an increased level of device monitoring to include proactive behavior. This review will also include identification of necessary fault isolation and remediation techniques. This initiative will focus on overhauling the current SolarWinds platform and implementing a Wire Data Analysis product such as ExtraHop. Capital funding will be requested in FY16 Budget.	7/2015	6 Months
3	Reconfigure as needed Tier 2 & 3 sites as identified by the Enterprise Architect in support of the Sonet backbone replacement.	7/2015	12 Months



4	Upgrade or replace end of Life security authentication platform used to access network nodes. (Capital funding required)	7/2015	3 months
---	--	--------	----------

Medium Term Goals (6-18 months) 1/1/16 - 12/31/16

#	Goal/Objective	Est. Start	Est. Duration
1	Review wide area network (WAN) utilization Metro wide to identify opportunities for optimization or need for upgrading capacity to normal operations.	1/2016	6 months
2	Build out Internet infrastructure and add redundant Internet connection for Business Continuity to support Cloud and Hosted services. (Capital funding required)	3/2016	6 months
3	Implement Dual entrance facilities in the Primary Data Center to support Business Continuity requirements. Estimated Capital funding secured in FY15 Budget.	6/2016	6 months
4	Implement Physical Security for network hardware via installation of lockable cabinets in Metro MDF & IDF. (Capital funding required)	1/2016	12 months

Long Term Goals (18-36 months) 1/1/17 - 6/30/18

#	Goal/Objective	Est. Start	Est. Duration
1	Multi-Date Center DR Implementation – This is a placeholder for the possible implementation of additional Data Centers in the Metro Enterprise. Capital funding will be requested in the implementation project for these data centers.	1/2017	6 Months
2	Internet Protocol v4 to Internet Protocol v6 conversion on external facing Internet services – No Capital funding required.	6/2017	6 months

Related Roadmaps:

- Data Center and Environmental Support
- Network Security
- Unified Communications
- Wireless Networking

