NTIA BTOP and Broadband for Mississippi

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Background

The Mississippi Institutions of Higher Learning[1] (IHLs) include four major research universities:

- Jackson State University (JSU) located in Jackson, MS,
- Mississippi State University (MSU) located in Starkville , MS,
- University of Mississippi (UM) located in Oxford, MS & the UM Medical Center located in Jackson, MS, and
- University of Southern Mississippi (USM) located in Hattiesburg, MS.

We have struggled for a number of years in achieving adequate connectivity to each other and to our peers via Internet2 and National LambdaRail. The importance of this connectivity is well-understood and has been articulated in the related NTIA BTOP comments titled, "Unleashing Waves of Innovation: Transformative Broadband for America's Future" from the broader higher education community[2]. The primary challenge for the Mississippi research IHLs has been and continues to be funding the expensive long haul connections from Jackson, MS out to MSU, UM Oxford, and USM in largely rural areas, which is made worse by the limited number of telecommunications vendors active in these areas.

The four research institutions first connected to Internet2 in 1997, largely aided by a National Science Foundation (NSF) grant. In July 2007, the four research institutions pulled out of the Mississippi state network to achieve a more cost-effective solution with higher bandwidth. This configuration, represented in Figure 1, consists of 1 Gbps metro ethernet connections from each of MSU, UM Oxford and USM to a point of presence (POP) in Jackson, MS that serves as a gateway to the Louisiana Optical Network Initiative (LONI)[3], providing commodity Internet, Internet2, and National LambdaRail access. Due to the close proximity of the JSU campus to the LONI POP, JSU connects by means of affordable leased fiber. When implemented, this configuration provided more than a ten-fold improvement over what was previously in place, yet now most of our peers are connecting at speeds of 10 Gbps and higher. Also, this configuration does not provide redundancy, leaving these institutions vulnerable to

[1] See http://www.ihl.state.ms.us/.
[2] See http://www.ntia.doc.gov/broadbandgrants/comment.cfm?e=D3A0F59A-BEFF-4C6B-AA5A-163FD33D08BD.
[3] See http://www.loni.org/.

fiber cuts. In a nutshell, this configuration is what we can afford given the geographical, social, and financial challenges present in Mississippi.

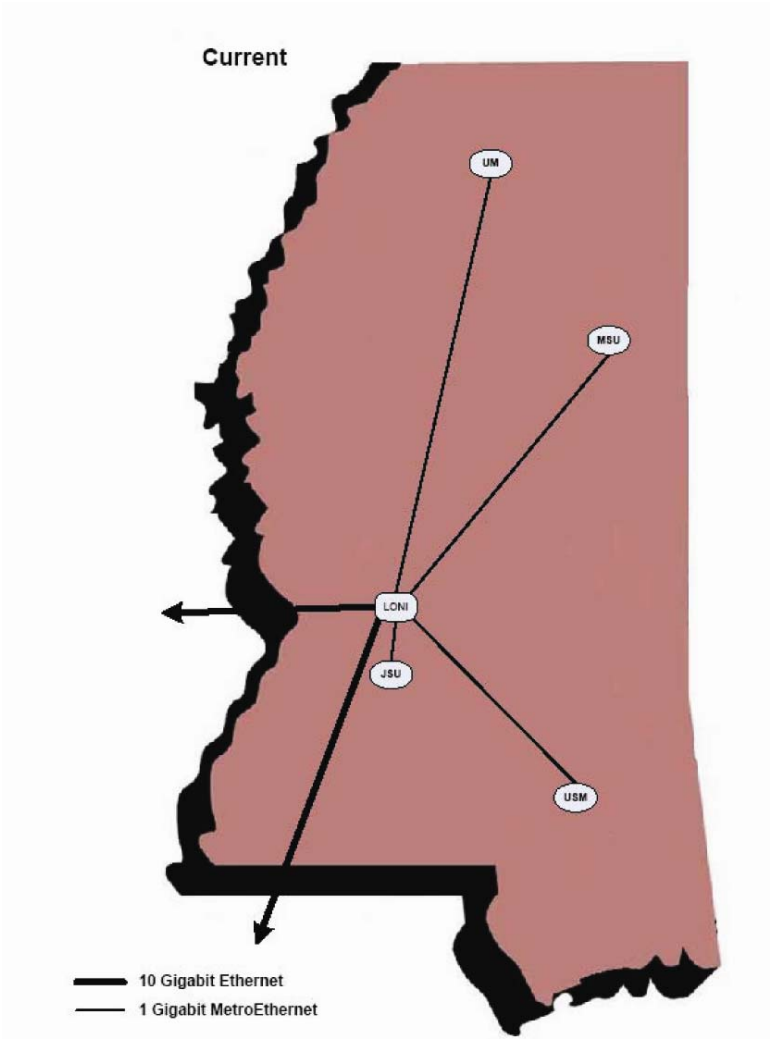

Figure 1. Current Configuration

The telecommunications challenges experienced by the Mississippi research IHLs are mirrored in the commercial sector. Many communities in Mississippi do not have adequate broadband access, even those located near universities, and even more so out in poor, rural communities. For example, it is not uncommon to live ten miles or less from a university and for DSL access to not be available. The options for achieving broadband access in places like the Mississippi Delta and in small towns such as Ecru, Duck Hill, and Woodville are very limited and present daunting challenges, which unaddressed adversely impact education, healthcare, and economic development.

From a much larger perspective, the lack of a regional optical network encompassing Mississippi forms a notable gap in the emerging national optical network infrastructure[4]. This is evident in the Advanced

[4] See http://paintsquirrel.ucs.indiana.edu/RON/archive/fiber_map_current.pdf.

Network Management Lab (ANML) Regional Optical Network Map hosted by Indiana University (see Figure 2). Moreover, the major research centers located in Mississippi such as NASA's Stennis Space Center also lack adequate connectivity.

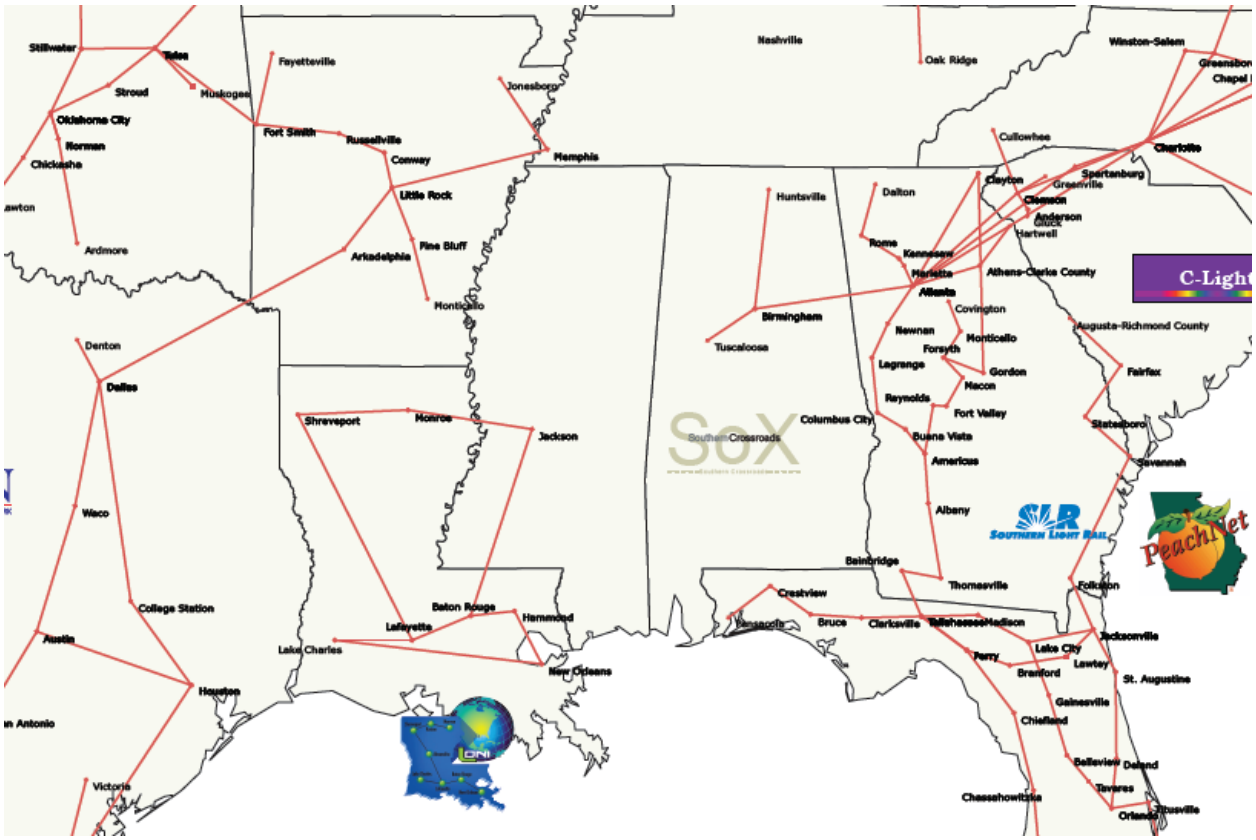

Figure 2. ANML Regional Optical Network Map: Southeastern US

Opportunities

In an effort to address these deficiencies, we have developed a proposal for the formation of a statewide optical network known as **Missi**ssippi **O**ptical **N**etwork (MISSION) with the purpose being threefold:

- to foster economic development,
- to propel education into the 21st century, and
- to keep Mississippi's research universities nationally competitive.

The most ideal scenario would be a public-private partnership that would provide the Mississippi research IHLs and federally-funded centers with high-speed connectively and simultaneously provide

the impetus to expand broadband access to unserved and underserved communities in Mississippi. The research IHLs would serve as primary nodes on a fiber optics corridor running roughly north-south throughout the state, allowing for future expansion that would encompass Mississippi community colleges, K12s, libraries, and more. Not only would MISSION meet a critical need in Mississippi, but also it would connect adjacent regional optical networks in the southeastern United States, e.g., LONI and SoX/SLR.

Observations and Questions

The goals of the NTIA Broadband Technology Opportunities Program (BTOP) nicely align with the issues faced by the Mississippi research IHLs, and we are encouraged to see the potential for addressing telecommunications challenges that have persisted for a number of years. Following are our observations and questions:

- A primary goal should be to increase the number of viable telecommunications vendors in Mississippi to allow for a more competition in the marketplace, thereby driving down costs. Toward this end, we advocate a public-private partnership that will stimulate and extend the overall telecommunications infrastructure in Mississippi, including reaching unserved and underserved communities.
- In putting together our proposal, we are considering the use of dark fiber. Will solutions that promote the construction of dark fiber or the lease of existing dark fiber assets be possible?
- Our proposal will include the extension of broadband infrastructure into rural areas in Mississippi. The construction of broadband infrastructure in these rural areas will be costly and take time for implementation. In order to address the criteria that projects supported by the programs will be substantially completed within two (2) years following an award, we are considering which areas to include as part of proposal. Will project timelines be extended where there are extenuating circumstances, so more rural areas can be served? If so, our proposal will include additional areas that will benefit.
- Will in-kind contributions and “sweat equity” count in meeting the non-federal funding match?
- We think that the most cost-effective solution over the long term is for the state to own part of the Mississippi fiber infrastructure. This solution will be more sustainable.
- Finally, will consideration be given to states like Mississippi that have a long way to go just to catch up with sister states thereby helping to level the playing field?

Summary

The NTIA BTOP offers great potential for addressing critical telecommunications infrastructure needs in Mississippi and bringing about much-needed improvements for the Mississippi research IHLs as well as the general population. We are encouraged by this opportunity and remain hopeful that the NTIA BTOP will make the MISSION proposal a reality.