

**2011 - 2012**

# INFRASTRUCTURE AND ARCHITECTURE PLAN

PUBLISHED BY  
THE MISSISSIPPI DEPARTMENT OF  
INFORMATION TECHNOLOGY  
SERVICES

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# INTRODUCTION

## STRATEGIC OBJECTIVES OF THE INFRASTRUCTURE AND ARCHITECTURE PLAN

Each year the Mississippi Department of Information Technology Services (ITS) publishes the *State of Mississippi Technology Infrastructure and Architecture Plan* to inform the Governor and the Legislature, the ITS Board, state agencies and institutions, and information technology vendors about plans for infrastructure growth in state government. This plan contains details pertaining to the core domains of the infrastructure and the IT projects planned for each domain.

ITS utilizes research capabilities and vendor relationships to keep pace with infrastructure technologies. These technologies are incorporated into our plan as they become beneficial to the state. ITS monitors changes in the infrastructure requirements and changes in technology through the agency and institution planning process, emerging technology initiatives, and participation in and tracking of infrastructure projects.

To view the *State of Mississippi Technology Infrastructure and Architecture Plan*, visit the ITS website ([www.its.ms.gov](http://www.its.ms.gov)) and select the Publications link.

## SCOPE OF THE INFRASTRUCTURE AND ARCHITECTURE PLAN

The evolving and expansive growth of data, voice, and video technologies provides a continuous challenge to seamless integration of these services into an enterprise that is customer-centric, scalable, secure, efficient, and effective. ITS' mission is to provide statewide leadership and services that facilitate cost-effective enterprise information technology and telecommunications solutions for agencies and institutions.

ITS' vision is that the Mississippi telecommunications and computing infrastructure will be a network of networks that is totally integrated, facilitating ubiquitous availability of voice, video, and information services to agencies, employees, and citizens in every corner of the state. The network will be a collaboration of the various infrastructure domains, listed within this document, that utilizes communication and computing technologies, web based computing applications, networking technologies, management tools, strategic planning, and human resources to provide state agencies with the essential tools to execute their missions. Through the consolidation of communication networks and technologies, state government in Mississippi is moving closer to being one cooperative enterprise, built upon a common architecture, rather than a collection of independent agencies.

For the purpose of this plan, the "Statewide Infrastructure" is defined as "those infrastructure domains that together offer, through connectivity, the potential for state entities to communicate with each other using voice, video, and data." It should be noted that some local infrastructure components are not considered a part of the Statewide Infrastructure, but are considered local infrastructure for a particular building, agency, institution, or campus.

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## SHARED TECHNOLOGY INFRASTRUCTURE GUIDING PRINCIPLES

The shared technology infrastructure principles are the general rules which hold true across the enterprise infrastructure and architecture. The following principles provide rationale for adherence, serve as starting points for difficult evaluations and decisions, and guide the design and selection of technology components.

PRINCIPLE	RATIONALE
IT is an enterprise-wide resource. IT investments will be aligned with the strategic goals of the state of Mississippi through planning and architecture processes.	<ul style="list-style-type: none"> <li>⇒ Reduce implementation and support costs, through a consistent enterprise-wide approach to IT solutions.</li> <li>⇒ Consolidate or integrate existing systems and technical infrastructure.</li> <li>⇒ Provide the IT foundation to support the business processes of state entities and local governing authorities.</li> </ul>
State IT infrastructure and architecture will support the state's long-term business, strategies and plans.	<ul style="list-style-type: none"> <li>⇒ Align and optimize IT resources with changing needs of state entities and local governing authorities. Enable the effective implementation of state business strategies.</li> <li>⇒ Highlight and promote the value of IT to executives and policy makers.</li> </ul>
State IT solutions that deliver products and services to stakeholders will leverage the shared technology infrastructure.	<ul style="list-style-type: none"> <li>⇒ Provide an infrastructure and architecture which will enable the state to:               <ul style="list-style-type: none"> <li>○ Respond to agency changes in technology and business requirements.</li> <li>○ Increase the consistency, accessibility, and sharing of data.</li> <li>○ Ensure interoperability by eliminating technology silos.</li> </ul> </li> </ul>
State IT infrastructure and architecture is adaptive and must evolve to accommodate changes in business and technology.	<ul style="list-style-type: none"> <li>⇒ Share and re-use IT assets.</li> <li>⇒ Ensure IT efforts support state business needs.</li> <li>⇒ Leverage the advantages of new technologies while balancing investments in existing systems.</li> </ul>
State IT solutions will be based upon industry standards and proven technologies that leverage the state IT infrastructure and architecture.	<ul style="list-style-type: none"> <li>⇒ Support and align with statewide initiatives.</li> <li>⇒ Increase the consistency, accessibility, and sharing of data and applications.</li> <li>⇒ Ensure a stable, long term, and viable technology and application environment.</li> </ul>
State IT solutions will actively seek opportunities to implement common sets of shared technologies and services.	<ul style="list-style-type: none"> <li>⇒ Reduce costs by eliminating redundant investments in technology.</li> <li>⇒ Improve systems management and administration via common infrastructure.</li> <li>⇒ Increase the state's ability to deliver quality products and services within budget limitations.</li> </ul>
State IT infrastructure and architecture will provide a reliable, secure, and highly-available network and technology infrastructure.	<ul style="list-style-type: none"> <li>⇒ Increase support for funding a functional, secure, and reliable infrastructure.</li> <li>⇒ Support the high-availability required for state and local governing authority missions.</li> <li>⇒ Improve delivery, efficiency, and accessibility of government services to the public.</li> </ul>

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# INFRASTRUCTURE AND ARCHITECTURE OVERVIEW

## FUNDING THE TECHNOLOGY INFRASTRUCTURE

A variety of methods are used to generate and make funding available for state government technology infrastructure projects. Technical infrastructure on the state government campus is primarily funded through general obligation bonds issued by the state for construction and renovation projects. This method of funding is generally used for infrastructure components that have a useful life of ten or more years. The ongoing operation and maintenance expenses associated with this type of infrastructure development are funded through a charge-back to the agencies that use these services and resources.

Shared infrastructure components that require periodic upgrades are: 1) the state's enterprise servers, open systems platforms, virtualized platforms and related software 2) the primary voice communications switch and its ancillary components and 3) the state's core fiber optic network. Usage rate structures are designed to generate the necessary funding for these upgrades. The statewide broadband network and aggregate Internet access are also funded through usage rates. The costs associated with the anticipated growth of these shared resources are included in the annual billing to the state entities and local governing authorities that use them.

Occasionally, state entities and local governing authorities include funding in their projects and initiatives that expand or enhance the state's technology infrastructure. Generally, however, this funding is focused on supporting the infrastructure of just those specific projects and initiatives. This funding method, therefore, is not always consistent with the overall standards and planned technical directions of the state as a whole.



Each of the methods described above is used in one way or another to fund technology infrastructure development for state government. There are times when circumstances and priorities require a combination of these funding methods to support needed projects. Additionally, with each infrastructure project, regardless of the funding method, opportunities to leverage federal grants and funding programs, such as E-Rate, are maximized to the fullest.

### Universal Service

The Communications Act of 1934 stated that all people in the United States should have access to “rapid, efficient, nationwide communications service with adequate facilities at reasonable charges”. In the Telecommunications Act of 1996, Congress further refined this goal, decreeing that it is federal policy to provide support for services “essential to education, public health, or public safety” and that all people, regardless of location or income level, should continue to have affordable access to telecommunications and information services. This concept, as defined here, has come to be known as “Universal Service”. The support mechanisms necessary to achieve universal service are administered by the Universal Service Administrative Company (USAC, [www.usac.org](http://www.usac.org)), an independent not-for-profit organization regulated by the Federal Communications Commission (FCC, [www.fcc.gov](http://www.fcc.gov)). USAC provides universal service support through these four programs:

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1. **High Cost**

This program supports telephone companies that serve high cost areas.

2. **Low Income**

This program assists low-income customers by helping to pay for monthly telephone charges as well as connection charges.

3. **Rural Health Care**

This program allows rural health care providers to pay rates for telecommunications services similar to those of their urban counterparts.

4. **Schools and Libraries**

This program, popularly known as “E-Rate”, provides discounted Internet access, internal connections, and telecommunications services to schools and libraries.

### **Schools and Libraries (E-Rate)**

The Schools and Libraries Program ([www.usac.org/sl](http://www.usac.org/sl)) was established by Congress to help make advanced telecommunications affordable for the nation’s K-12 schools and libraries. It provides discounts ranging from 20% to 90% on the costs of eligible telecommunications services, Internet access, and internal connections. The highest discounts go to the schools and libraries serving the most disadvantaged populations, where over 50 percent of the students in the district qualify for the National School Lunch Program.

In the thirteen years (1998 – 2010) of the E-Rate program, schools and libraries nationwide have received \$29,560,581,516.89. Mississippi schools and libraries have received \$453,725,735.49, or an average of \$34,901,979.65 per year (<http://www.e-ratecentral.com/us/stateInformation.asp?state=MS>). For eligible schools and libraries, these dollars have been realized in the form of discounts on telecommunications services, Internet access, and internal connections as well as discounts for services procured on their behalf. These dollar amounts reflect the committed funds, not the actual dollars spent.

ITS fills several roles related to E-Rate:

- ★ **Applicant** - The shared components of the State network are utilized by state government, K-12 schools, public libraries, community colleges and Institutes of Higher Learning (Universities). ITS files for e-rate discount on behalf of the eligible participants, for the shared infrastructure that is eligible. The calculation is based on the percentage of eligible to non-eligible entities that share the resources.
- ★ **Master Contracts** - ITS posts Form 470s and issues Request for Proposals (RFPs) to establish E-Rate eligible master contracts from which schools and libraries can receive E-Rate eligible services. Examples of these services are: Switch EPL, MPLS/Frame Relay/ATM Circuits, Local Telephone Service, Cellular Service, and in-state/out-of-state long distance.
- ★ **State Level Coordination** - ITS works with the Department of Education, the Library Commission, and service providers throughout the E-Rate process. Through this coordinated effort, the State of Mississippi has maintained a 100% participation rate of public school districts, and a 99% participation rate of public libraries in the E-Rate program.
- ★ **National Responsibility** - Through affiliations with the National Association of State Technology Directors (NASTD) and with the State E-Rate Coordinators Alliance (SECA), ITS is involved at the national level in efforts to continually improve the program. ITS routinely works with the Federal Communications Commission (FCC), the Schools and Libraries Division (SLD) of USAC, and has been called upon to testify before Congressional hearings that deal with issues related to the program. The ITS Federal Programs Coordinator chairs the SECA group which is made up of forty-seven states and ninety-four members. ITS, through these affiliations, participates in monthly conference calls with representatives from SLD, FCC, USAC, and State E-Rate Coordinators.

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The following is a recap of the 13 years of the E-Rate program. The table below represents the actual discounts committed to the State of Mississippi applicants during the years depicted.

<b>E-Rate Funding Year</b>	<b>Discount</b>
2010	\$ 35,893,224
2009	\$ 36,109,711
2008	\$ 34,605,986
2007	\$ 32,484,638
2006	\$ 36,604,831
2005	\$ 41,314,636
2004	\$ 43,355,684
2003	\$ 38,565,688
2002	\$ 33,566,915
2001	\$ 34,519,723
2000	\$ 29,654,673
1999	\$ 32,807,580
1998	\$ 24,242,445

*Discounts for the  
thirteen years total  
\$453,725,735.*

### **Effect of E-Rate on Mississippi’s Multi-Protocol Label Switching (MPLS) Network**

All participants on the statewide network benefit from ITS’ participation in E-Rate, even though, primarily, the intended beneficiaries of E-Rate discounted services are schools and libraries. From July 1, 2011, through June 30, 2012, the combined estimated cost for the 10B circuits and for connectivity to MPB video circuits will be \$702,264. E-Rate provides ITS with a cost reduction of \$426,540. This cost reduction will allow ITS to reduce its billing to the consortium members by \$426,540.

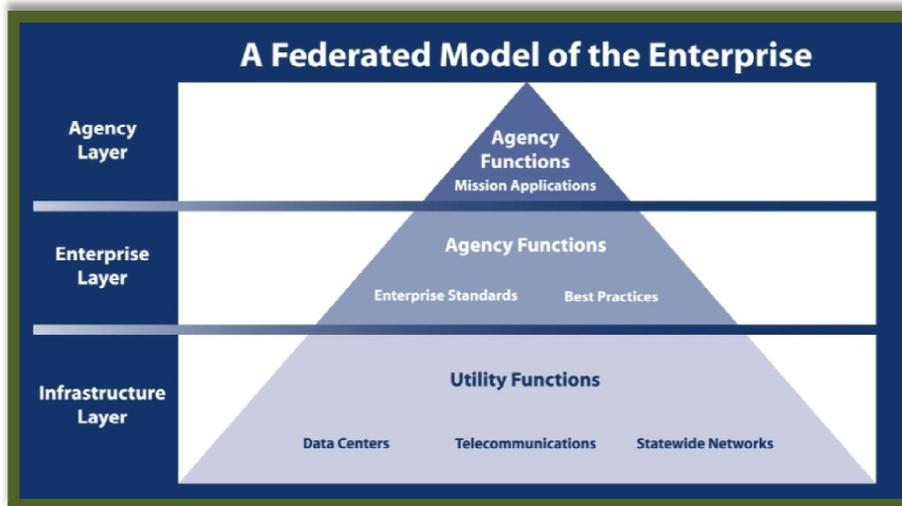
Because the network costs are reduced, the State of Mississippi is able to build an even more efficient and robust network to better serve the state’s rapidly growing needs. An additional benefit is that through broadband deployment to all schools and libraries in the state, that same broadband technology becomes available to all citizens of the state. As broadband continues to be deployed to every school and every library in even the most rural areas of the state, the businesses and residents in those areas are increasingly being offered access to those broadband services. By definition, that is “universal service”.

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## SHARED TECHNOLOGY INFRASTRUCTURE

A shared technology infrastructure is the basis for a federated model of governance. A federated model is made up of three layers that build upon one another to support state government missions.



As part of the state’s infrastructure layer, functions needed by many agencies that are not specific to individual environments, such as data center operations, are managed as a part of a shared technology infrastructure. This is similar to utility services – it is not appropriate for each agency to design and build a custom telephone system when fully featured and interoperable systems are available. These services must be highly reliable, cost effective, and serve as the foundation for agency mission applications.

The enterprise layer consists of the standards that ensure interoperability and consistent best practices across state government. This common set of policies, standards, and guidelines will form a responsive and flexible architecture. This layer represents an area of shared responsibility among state agencies.

The agency layer (“agency” in this model encompasses state entities and governing authorities) is composed of functions that are directly and uniquely aligned with the execution of each agency’s mission. Each agency retains the flexibility to focus on innovation that directly advances its mission while building on the established infrastructure of the state. As agencies innovate independently, a statewide return on investment model and quality assurance reviews provide consistent methods to allow independent projects to be compared and prioritized.

This federated model ensures a flexible approach that can distinguish between strategic projects that are directly tied to individual agency missions and shared technology infrastructure that should be managed at a statewide level for the benefit of all agency missions. Mississippi state government can leverage the value of its technology investments in three different areas:

- ★ **Increased Cost Effectiveness** – The state can spread the cost of service over multiple agencies, fully leveraging the state’s purchasing power. Bringing these efficiencies to bear allows more agencies the ability to make use of the service, further expanding the economies of scale.

*This federated model ensures a flexible approach that can distinguish between strategic projects that are directly tied to individual agency missions and shared technology infrastructure that should be managed at a statewide level for the benefit of all state government missions.*

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Properly implemented, a shared technology infrastructure encourages collaboration, reuse of intellectual capital, and better long term cost models.

- ★ **Improved Service Delivery** – Administrators of a shared infrastructure will develop deeper skills and, therefore, provide better and frequently lower cost service to all end users. Agencies unable to dedicate employees to critical functions, such as network and data security, will have improved and consistent access to resources.
- ★ **Focus on Core Missions** – When directors and technologists are relieved of some of the burden of managing tactical IT issues, their agencies are in a better position to assess and act on those technologies that advance their core missions and directly add value to the lives of the citizens.

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# STATEWIDE INITIATIVES

## MISSISSIPPI HEALTH INFORMATION NETWORK

Through the American Recovery and Reinvestment Act of 2009 (ARRA), Mississippi was designated and approved to receive \$10.3 million in funding from the State Health Information Exchange Cooperative Agreement Program. The funding covers planning and implementation projects to advance appropriate and secure health information exchange (HIE) across the United States. With the cooperative agreement funding and additional matching monies, Mississippi formalized an approved state plan and will implement the infrastructure for a statewide HIE, the Mississippi Health Information Network (MS-HIN). The MS-HIN will utilize a technology platform capable of rapid connectivity and be able to interface with providers of care, public health organizations, local and regional health information exchanges, as well as provide connectivity to the National Health Information Network (NHIN).

In close collaboration with the Office of the Governor, ITS will assist the Health IT Coordinator with key tasks such as overall project management and monitoring of the project's ongoing progress, preparation of reports, and communications with other partners and the Office of the National Coordinator for Health Information Technology (ONC).

The state was approved to receive funding for the planning phase of the MS-HIN on March 15, 2010 and finalized the procurement process for RFP No. 3628 securing a vendor to develop and submit the State's strategic and operational plan (SOP) as required by the ONC. Work on the State's SOP began April 26, 2010 and was completed on September 27, 2010.

House Bill 941 was passed in the 2010 legislative session providing the initial structure and leadership rules for the statewide HIE called the Mississippi Health Information Network (MS-HIN). This legislation also created the MS-HIN Board which is responsible for the oversight of the MS-HIN. Board members include representatives from the Division of Medicaid, Department of Mental Health, Department of Health, State Medical Association, Delta Health Alliance, Information Quality Healthcare, Blue Cross Blue Shield, MS Primary Healthcare Association, a hospital representative, Department of Information Technology Services, and the University of Mississippi Medical Center. The Board has met on the third Wednesday of each month since October, 2010.

In addition, to the MS-HIN Board meetings, a small working group was convened to oversee contract negotiations with Medicity. Medicity was deemed the lowest cost and best technical vendor and was secured through a state procurement process to provide services for the coastal HIE pilot project launched in September 2008. It was decided during the strategic planning process that Medicity would become the statewide HIE platform, building on the current and operational coastal infrastructure. The contract negotiation work group met numerous times to discuss expanding the contract statewide, with emphasis on providers meeting the Meaningful Use requirements to be eligible to receive Medicaid incentive payments.

The state finalized contract negotiations at the end of April, 2011 securing a Health Information Service Provider (HISP) and the supporting infrastructure needed to expand the MS-HIN across the state. The HISP will allow providers, even those without electronic health records (EHRs), to enroll for a federal "DIRECT" address that will allow them to send and receive secure messaging from all other "DIRECT" providers not only within the state, but throughout the country. While this is not a venue of robust exchange, it is an important function that will allow providers the opportunity to at least meet the requirement of Medicaid Stage 1 Meaningful Use. The MS-HIN will also be able to accommodate a

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robust exchange of health information among providers with current EHRs looking to fully leverage all the advantages associated with an HIE.

Currently the MS-HIN is determining prices for the HIE services and is in the final stage of development of the sustainability model. Medicity and the MS-HIN are also working to finalize the work plan for the initial DIRECT implementation to begin in August 2011. Once pricing and the work plan have been completed, working closely with the Department of Medicaid and the state's Regional Extension Center, an aggressive education and marketing campaign will be executed.

## **GEOGRAPHIC INFORMATION SYSTEMS (GIS)**

The Mississippi Geospatial Clearinghouse (MGC) was placed in production in September 2007 and serves as the state's premier portal for the Geographic Information System (GIS) community to search, discover, share, and use a comprehensive warehouse of Mississippi's geospatial resources. The goal of the MGC is to make the application of spatial information technologies within the state of Mississippi more efficient by eliminating the duplication of spatial data production and distribution through cooperation, standardization, communication, and coordination. Moreover, the MGC is the primary location for the Mississippi Digital Earth Model (MDEM). The MGC is housed in the State Data Center at the Mississippi Department of Information Technology Services (ITS).

State agencies, county government, city government and the public can download data that has been stored in the MGC. This data provides the foundation for applications to be developed using GIS technology to meet business needs of the governmental agencies and/or public interest.

In April, 2011, ITS performed a major software upgrade and redesign to the MGC (<http://www.gis.ms.gov>). The new design provides an easy to use method for three data delivery mechanisms: visualization, information search, and data download. The visualization utilizes Adobe Flex, which provides simple access to the ESRI map services and ITS-hosted map and image services. The viewer user tools have been improved for locating, drawing graphics, measuring, printing, and exporting maps as seen by the user. The information search mechanism is more user-friendly and differentiates between MDEM and Non-MDEM datasets which allows for a natural flow to data download. GIS data is also available through "Quick Download" packages or through custom online requests.

ITS continues to work with the Mississippi Coordinating Council for Remote Sensing and GIS in the enhancement of the MGC and in the maintenance of GIS hardware and software procurement instruments for state agencies and local governing authorities.

## **WIRELESS COMMUNICATIONS AND INTEROPERABILITY**

Interoperability in wireless communications is generally defined as the ability to communicate on demand and in real time, across multiple agencies and local jurisdictions, while exchanging voice and/or data when needed and as authorized. Currently, this ability does not exist in Mississippi on a statewide basis. This lack of communication is a nationwide problem highlighted by the tragedies of recent years including the events of September 11 and the disasters of Hurricanes Katrina and Rita. The lack of a common communications system severely hampered the response to these events.

Senate Bill 2514, passed during the 2005 Legislative Session, created the Mississippi Wireless Communication Commission (WCC) and Legislative Advisory Board. The WCC, comprised of representatives of state and local governmental entities, is charged with making recommendations and developing strategies for achieving interoperability to ensure that effective communications services are

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available in emergencies. The legislation states that the WCC, in conjunction with ITS, shall have the sole responsibility to promulgate rules and regulations governing the operations of wireless communications systems. The WCC and its advisory board are working to develop a plan for statewide wireless communications, including voice and data.

In March 2006, ITS issued RFP No. 3429 on behalf of the WCC for the acquisition and three-phase deployment of a statewide, public-safety grade, seamless roaming, digital, trunked land mobile radio system. The Mississippi Wireless Information Network (MSWIN) system is based on the APCO P25 Standard and is designed to accommodate state agencies, local governments, and other first responders. Motorola, Inc. was awarded the contract in the second quarter of 2007. MSWIN will be implemented in phases beginning in the southern part of the state and progressing northward. Initial site acquisition was completed, and construction began in second quarter 2008. Phase 1 of MSWIN, consisting of forty-four tower sites in the southern third of the state became operational June 2010. Thirteen tower sites linking the Phase 1 sites to the capitol area in Jackson were completed as well. The completion of Phase 2, fifty-two sites in Central Mississippi is scheduled for completion Spring 2011. Phase 3 in the northern third of the state should be completed by December 2011. The WCC is working with county and municipal governments across the state to provide information on the MSWIN system and encourage local governing authorities to take advantage of this interoperable communications infrastructure.

In another key wireless initiative, the WCC and ITS issued RFP No. 3489 for statewide cellular services and awarded the contract to Cellular South in the second quarter of 2007. The WCC intends for this contract to encourage a statewide build-out to deploy cellular voice and data services statewide. The majority of state agency cellular usage has been converted to the new contract, and significant numbers of county and municipal governments are taking advantage of the contract pricing structure.

Wireless communications and interoperability are ongoing, high cost, and highly complex initiatives impacted by the rapid expansion of available wireless solutions. The state and the WCC must consider and address short, middle, and long-term needs for achieving seamless wireless voice and data communications across all entities, disciplines, and jurisdictions. A common governing structure for managing and directing wireless projects and operations across state entities will improve the effectiveness of wireless communications and serve as the foundation for the interoperability needed to protect the health and safety of the citizens of our state.

## **STATE BROADBAND INITIATIVE**

The State Broadband Initiative (SBI), formerly the State Broadband Data and Development Program, implements the joint purposes of the Recovery Act and the Broadband Data Improvement Act, which envisioned a comprehensive program, led by state entities or non-profit organizations working at their direction, to facilitate the integration of broadband and information technology into state and local economies. Economic development, energy efficiency, and advances in education and health care rely not only on broadband infrastructure, but also on the knowledge and tools to leverage that infrastructure.

Since the program's inception in 2009, the National Telecommunications and Information Administration (NTIA) has awarded a total of \$293 million to 56 grantees, one each from the 50 states, 5 territories, and the District of Columbia, or their designees. Grantees will use this funding to support the efficient and creative use of broadband technology to better compete in the digital economy. These state-created efforts vary depending on local needs but include programs to assist small businesses and community institutions in using technology more effectively, research to investigate barriers to broadband adoption, innovative applications that increase access to government services and information, and state and local task forces to expand broadband access and adoption.

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Since accurate data is critical for broadband planning, another purpose of the SBI program is to assist states in gathering data twice a year on the availability, speed, and location of broadband services, as well as the broadband services that community institutions, such as schools, libraries and hospitals, use. The data, including publicly available state-wide broadband maps, is used to develop the comprehensive, interactive National Broadband Map.

During 2010, the Mississippi Office of the Governor, the state's eligible entity, received SBI grant awards comprised of approximately \$7 million for broadband data collection and mapping activities and for broadband planning activities over a five-year period. ITS is spearheading the broadband data collection and mapping initiative in conjunction with our mapping vendor, BroadMap. Broadband data collection efforts began in the first quarter of 2010 and this information has been utilized to create the first statewide broadband inventory map for Mississippi ([broadband.ms.gov](http://broadband.ms.gov)) which was released in December 2010.

Mississippi utilized a portion of the broadband planning funding to support the creation of the Mississippi Broadband Connect Coalition (MBCC), a non-profit, public-private partnership focused on producing a comprehensive statewide strategic plan for improving digital literacy, increasing access to broadband and enabling greater adoption of broadband in the state. The MBCC is composed of over 150 industry leaders, community representatives, state agencies, and broadband end-users. The MBCC consists of eight committees. These groups will meet throughout 2011 to create targeted recommendations for their areas of study. The recommendations will be included in a report that will outline a strategy for broadband development and use in Mississippi.

Through a partnership with Mississippi State University Extension Service, this strategy will be translated into activity in all parts of the state. Extension Service personnel will be responsible for holding planning meetings at the regional and local level designed to identify barriers to adoption of broadband internet and local solutions. Over the life of this multi-year grant program, Mississippi hopes to improve broadband access and use for its citizens and maximize its benefits for the state.

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# PLATFORM DOMAIN

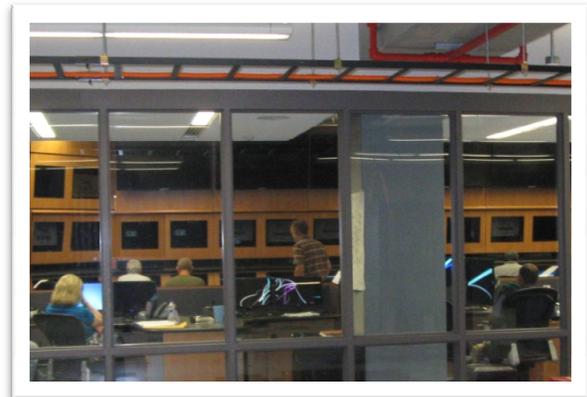
## ENTERPRISE PHYSICAL FACILITY

### Description

The State Data Center is operated by ITS and provides centralized information technology resources to agencies requiring shared information, enterprise computing resources, or any other centrally managed resource.

The State Data Center contains:

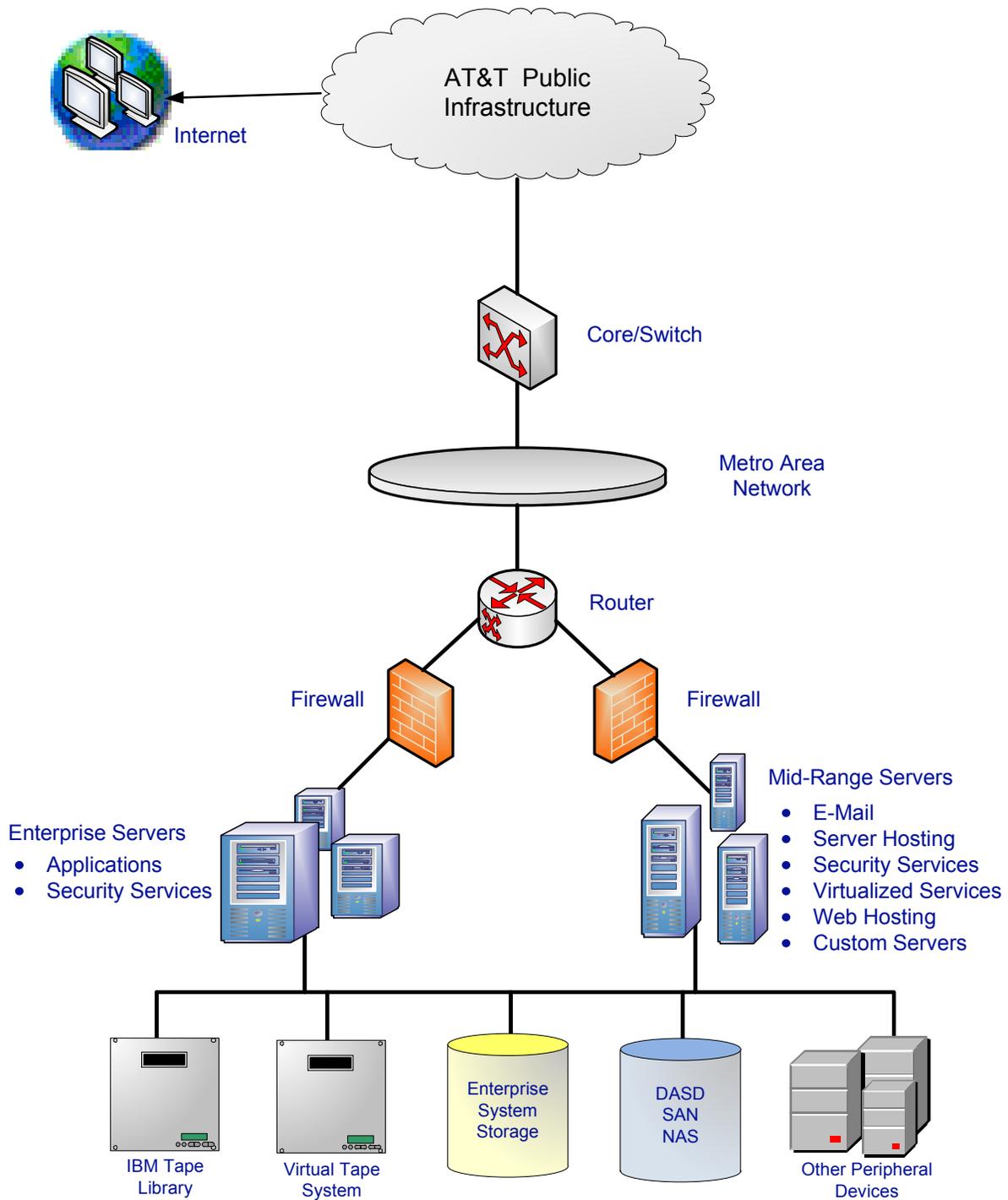
- ★ Core routers and switches supporting the state's Wide Area Network (WAN) and Metro Area Network (MAN) (along with network and security management components required for supporting the network)
- ★ Three mainframes and peripherals: one serving the Department of Finance and administration (DFA), one serving the Department of Human Services (MDHS) and the third shared by numerous other state agencies
- ★ Virtualized Server platforms for most all operating systems
- ★ INTEL and RISC Server Platforms
- ★ E-mail servers and relays
- ★ Mississippi Executive Resource and Library Information Network (MERLIN) warehouse server managed by the Department of Finance and Administration's (DFA) Mississippi Management and Reporting System (MMRS) division
- ★ Various other servers and peripherals



### *PHYSICAL FACILITIES EQUIPMENT*

Included in the State Data Center are the following features that contribute to a secure and available physical environment:

- ★ New F4 tornado/storm resistant state of the art Data Center with floor space for critical primary state IT assets
- ★ Electrical switches and panels
- ★ Chillers
- ★ Computer room floor units
- ★ Intelligent fire protection and alarm system
- ★ Raised floor system
- ★ Command and control console equipment
- ★ Security system with card access and security cameras
- ★ Uninterruptible Power Supply (UPS) system and multiple generators



## State Data Center Diagram

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## Proposed Projects

- ★ Development of a Co-Processing Facility

## Benefits to the State

State agencies utilizing the State Data Center to house IT equipment will benefit from the following features:

- ★ Secure physical environment monitored and manned 24-hours a day, 365 days a year
- ★ Fully redundant power source
- ★ Environmentally controlled space
- ★ Fully equipped fire suppression system with fire and water alarms

## ENTERPRISE SERVER

### Description

The databases and programs for many traditional mainframe monolithic applications in state government are mission-critical and reside on IBM mainframes. These applications include: the Department of Finance and Administration's Statewide Automated Accounting System (SAAS) and Statewide Payroll and Human Resource System (SPAHRs), the Department of Revenue's Motor Vehicle Title and Registration System, and the Department of Health's Patient Information Management System (PIMS), and the Supreme Court's Electronic Case Management System. Another IBM mainframe, belonging to the Mississippi Department of Human Services (MDHS), operates in parallel sysplex sharing mode with the other processors. Most of MDHS's large database applications run on this server including the Mississippi Applications Verification Reporting Information and Control System (MAVERICS), the Mississippi Enforcement and Tracking of Support System (METSS), the Jobs Automated Work System (JAWS), and the Mississippi Automated Child Welfare Information System (MACWIS). The Department of Finance and Administration is implementing a new SAP-ERP system to manage state financial systems on a current technology mainframe platform.



### *HARDWARE AND SOFTWARE*

#### Hardware

- ★ 1-IBM 2096-S03 system
- ★ 1-IBM 2096-S02 system
- ★ 1-IBM z196 system
- ★ Multiple IFL engines (Linux only processor)
- ★ Multiple Zcap processors (Java only processor)
- ★ Multiple Zip processors (DB2 only)
- ★ 2-Coupling facilities
- ★ Multiple OSA-Express 1000Base-T Ethernet ports
- ★ Multiple OSA-Express Gigabit Ethernet LX
- ★ Multiple FICON ports
- ★ Multiple IBM Enterprise Storage Server DS8300 and NAS disk subsystems
- ★ IBM Robotic Tape Library Storage Subsystem

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- ★ IBM Virtual Tape System integrated with Robotic Tape Subsystem

## Software

- ★ Operating system - Z/OS features include:
  - ⊙ Communications server (TCP/IP, SNA)
  - ⊙ Cryptographic services (digital signatures, secure sockets layer (SSL), etc.)
  - ⊙ DFSMSdfp with DFSMShsm and DFSMSdss
  - ⊙ DFSORT
  - ⊙ IBM HTTP server
  - ⊙ JES2
  - ⊙ JESMaster
  - ⊙ Language environment
  - ⊙ TSO/E and ISPF
  - ⊙ Security server (LDAP and firewall technologies)
  - ⊙ UNIX system services - Z/VM
  - ⊙ SUSE LINUX
  - ⊙ Databases
  - ⊙ ADABAS
  - ⊙ DB2
  - ⊙ Transaction processing
  - ⊙ CICS transaction server
  - ⊙ Programming languages
  - ⊙ Natural
  - ⊙ COBOL for MVS
  - ⊙ High level assembler
  - ⊙ C/C++
  - ⊙ Java
  - ⊙ SAS
  - ⊙ CA-EasyTrieve
  - ⊙ System management and monitoring products
  - ⊙ CA-TLMS
  - ⊙ CA-7
  - ⊙ CA-11
  - ⊙ CA-View
  - ⊙ CA-Deliver
  - ⊙ CA-OPS
  - ⊙ CA-SYSVIEW monitoring tools (MVS, CICS)
  - ⊙ CA-NetMaster for monitoring TCP/IP
  - ⊙ CA-Vantage
  - ⊙ CA-Crews
  - ⊙ CA-MasterCat
  - ⊙ VPS for printer management
- ★ Programmer productivity tools
  - ⊙ CA-Optimizer
  - ⊙ File-AID
  - ⊙ Xpediter (TSO, CICS)
  - ⊙ Natural Construct

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## ***SERVICES PROVIDED***

- ★ Technical expertise in all supported platforms
- ★ Computing power, physical facilities, and data storage capacity to support agencies' software applications
- ★ A secure environment for the data that ensures its continual availability
- ★ 24-hours a day, 7 days a week operation with 24-hour on-call technical support
- ★ A Service Desk that routes calls to the person most capable of providing the necessary assistance
- ★ Support for approximately 100 system software products
- ★ Acquisition and implementation of systems software products requested by state agencies
- ★ Assistance with the installation of application systems
- ★ Resolution of all problems related to systems software running at the State Data Center
- ★ Backup and recovery processes
- ★ Disaster recovery facilities and disaster recovery planning guidance

## **Proposed Projects**

The following projects are planned for the Enterprise Server component:

- ★ Ongoing evaluation of the zSeries platform for mission-critical state applications
- ★ Support the DFA implementation of SAP-ERP on mainframe z/VM, z/Linux-SUSE, z/OS, z/DB2
- ★ Re-evaluate and restructure mainframe software contracts
- ★ Run more Linux applications on zSeries as solutions for some E-Business services
- ★ Explore options for providing seamless web access to legacy data residing in any enterprise server database or file (This may require software upgrades, expansion of middleware services, or even the addition of software or hardware products.)
- ★ Upgrade zSeries operating system and support subsystems
- ★ Implement current NAS Technology
- ★ Implement the SAN Volume Controller (SVC) and other leading virtualized storage technology

## **Benefits to the State**

The Enterprise Server provides state entities with the following benefits:

- ★ Scalable, stable, available, and highly secure environment for application systems
- ★ Shared systems that produce long-term savings with economies of scale
- ★ Environment that supports both legacy applications and more recent E-Business applications, permitting integration on the same platform
- ★ Backup and recovery procedures
- ★ Annually tested disaster recovery procedures
- ★ Mature systems management facilities
- ★ Mature development environment
- ★ 24-hours a day, 7 days a week, 365 days a year operations
- ★ Secure physical environment with dual power sources and controlled environment

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## VIRTUALIZED INFRASTRUCTURE

### Description

High-performance microprocessors and high speed networking technology make it possible to deploy large applications, segmented by function, on the most cost-effective platform.

Among the applications deployed in this virtualized environment are:

- ★ Mississippi Electronic Courts
- ★ The Department of Human Services' GIS application
- ★ The Department of Revenue integrated tax system
- ★ The Interwoven Document Management systems for several agencies
- ★ The E-Government applications

While E-Government represents an umbrella term inclusive of web based applications developed by ITS, other state government IT staff, or a third party vendor, it also covers enterprise infrastructure elements such as the state portal, payment engine, application development suites, document and content management services, integration middleware, directory services, email, access security, and the servers needed to support these services.

### *HARDWARE AND SOFTWARE*

#### Hardware

- ★ Enterprise Servers
  - ⊙ z/VM
  - ⊙ z/Linux – Suse Unix
  - ⊙ z/OS
- ★ Large Scale INTEL and RISC server Environments
  - ⊙ VMware Servers
  - ⊙ WebSEAL Proxy server
  - ⊙ Application servers
  - ⊙ Middleware servers
  - ⊙ Database servers
  - ⊙ WebSphere Portal environment
  - ⊙ GIS environment
- ★ Various dedicated Intel servers
  - ⊙ Verity Ultraseek search engine server
  - ⊙ Microsoft SQL database servers
- ★ Storage area network (SAN) and Network Attached Storage (NAS) with approximately 100 Terabytes storage

#### Software

- ★ AIX operating system
- ★ Apache HTTP Server
- ★ Crystal Decisions
- ★ Domain name servers
- ★ Enterprise performance monitoring products
  - ⊙ CA-UniCenter Database Performance
  - ⊙ CA-UniCenter MQ Services
  - ⊙ CA-UniCenter Network and Systems Management
  - ⊙ CA-UniCenter WebServices
  - ⊙ CA-UniCenter WebSphere
  - ⊙ CA-Management Portal

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- ★ EntireX Integration
  - ★ HACMP–failover
  - ★ Autonomy-Interwoven WorkSite Collaborative Document Management Suite
  - ★ Autonomy-Interwoven TeamSite Enterprise Content Management Suite
  - ★ IBM DB2
  - ★ IBM MQSeries and Host Access Transformation Services Information Brokering
  - ★ IBM/Tivoli Access Manager
  - ★ IBM WebSphere application development tools
  - ★ IBM WebSphere Application Server
  - ★ IBM WebSphere Portal
  - ★ Microsoft AD – Active Directory
  - ★ Microsoft Exchange eMail
  - ★ Microsoft SQL
  - ★ Microsoft Windows server operating system(s)
  - ★ Microsoft IIS server
  - ★ Sophos Mail Relay servers
  - ★ Rational/ClearCase/ClearQuest
  - ★ Verity Ultraseek search engine
  - ★ ESRI Enterprise Software Suite
  - ★ Red Hat Unix Operating System
  - ★ Suse Unix Operating System
  - ★ Strohl Systems LDPRS and BIA (Business Continuity and Business Impact Analysis Tools)
  - ★ Lotus Notes Domino server
  - ★ CA Spectrum/eHealth Systems management servers
  - ★ Various failover servers
  - ★ Various test servers
  - ★ Hosted Agency applications servers

### ***SERVICES PROVIDED***

- ★ ITIL Best Practices
  - ⊙ Service Center – Service Desk – Single point of contact
  - ⊙ All Requests and Incidents logged and triaged
  - ⊙ Change Management weekly meeting and logging of major changes.
  - ⊙ Performance management and reporting of environment
- ★ Internal Cloud service offer on virtual servers and storage.
- ★ Application failover
- ★ Authentication/authorization
- ★ Disk and Tape based backup and recovery
- ★ Environmental Controls
- ★ Database configuration and administration
- ★ Disaster recovery planning/Business continuity planning
  - ⊙ BIA- Business Impact Analysis
  - ⊙ BCP- Business Continuity Plans
- ★ Enterprise content management
- ★ Enterprise performance monitoring/remote performance monitoring
  - ⊙ Web applications (WebSphere, Windows)
  - ⊙ Hardware
  - ⊙ Software (operating and system)
  - ⊙ Databases
- ★ Enterprise search services
- ★ Enterprise systems monitoring services
- ★ High speed Internet access

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- ★ Information brokering
  - ★ LDAP directory services
  - ★ Operations support 24-hours a day, 7 days a week, 365 days a year
  - ★ Physical security to protect access to the Infrastructure
  - ★ Portal hosting services
  - ★ Project management
  - ★ Data Security
  - ★ Storage capacity–SAN (Storage Area Network-Block Level), NAS (Network Attached Storage-File Level); tiered architecture and virtual storage
  - ★ System integration services
  - ★ Power management via UPS and generator backup
  - ★ Web application hosting
    - ⊙ Microsoft ASP.Net
    - ⊙ Java
    - ⊙ Lotus Notes/Domino
  - ★ Website hosting
  - ★ Application hosting

### **Proposed Projects**

The following projects in active development for the virtualized infrastructure:

- ★ Joint venture with NIC for updated state ms.gov portal with additional functionality
- ★ Supporting infrastructure for DFA's SAP project updating financial management systems improving control and analysis of State finances
- ★ Increased IT efficiency in E-government using Virtualized Servers and Storage
- ★ Increasing the usage of Service Oriented Architecture (SOA) web services
- ★ Wireless applications
- ★ Completing upgrade of the State GIS Portal both Hardware and Software updates

### **Benefits to the State**

State agencies will benefit from the use of the virtualized infrastructure components in the following ways:

- ★ 24-hours a day, 7 days a week, 365 days a year operations services for monitoring of critical applications
- ★ Backup and recovery
- ★ Charges, if applicable, based on usage and cost of doing business
- ★ Common infrastructure for services that support complex business processes spanning multiple applications
- ★ Fully functioning development environment
- ★ Fully secured environment
- ★ No duplication of hardware and software
- ★ Performance and availability
- ★ Disaster Recovery tested
- ★ Compliant with security standards
- ★ Centrally audited and penetration tested

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## STATE GIS INFRASTRUCTURE

### Description

The Mississippi Geospatial Clearinghouse (MGC) provides access to a comprehensive spatial information warehouse of the Geographic Information Systems (GIS) resources of Mississippi. This warehouse was developed for use by government, academia, and the private sector. The goal of the MGC ([www.gis.ms.gov](http://www.gis.ms.gov)) is to make the application of spatial information technologies within the State of Mississippi more efficient by reducing the duplication of spatial data production and enhancing distribution through effective cooperation, standardization, communication, and coordination. ITS continues to work with the Mississippi Coordinating Council for Remote Sensing and GIS in the enhancement of the MGC.

### *HARDWARE AND SOFTWARE*

#### Hardware

- ★ 2 – Vsphere Virtual Servers 4 core (2.66 GHz with 4 GB of RAM)
- ★ 1 – Vsphere Virtual Server 4 core (2.66 GHz with 16 GB of RAM)
- ★ 1 – SQL 2008 Database located on GIS SQL Server 8 core (2.66 GHz with 4 GB of RAM)
- ★ 2 - Vsphere Virtual Server 1 core (2.66 GHz with 2 GB of RAM)
- ★ SAN storage
- ★ Back up and recovery

#### Software

- ★ 6–Operating system Windows 2008 servers 64 bit
  - ⊙ ESRI 10 SP1 ArcGIS server Advanced Enterprise and Standard .Net (3 Production, 2 Development)
  - ⊙ ESRI 10 SP1 Image Server Extension
  - ⊙ SQL Server 2008
  - ⊙ Microsoft IIS Application Server .Net

### *SERVICES PROVIDED*

- ★ GIS professional/strategic services and consulting, which allows agencies to have access to technical expertise in GIS information technology
- ★ Computing power, physical facilities, and data storage capacity to support agencies' GIS software applications
- ★ A secure environment for the data that ensures its continual availability
- ★ A help desk that routes calls to the person most capable of providing the necessary assistance
- ★ Express Product Lists (EPL) for GIS hardware and GIS software for acquisition and implementation of systems software products requested by state agencies
- ★ GIS application design and hosting
- ★ GIS database design and hosting
- ★ GIS web map services
- ★ GIS data and application backup and recovery
- ★ Provide technical assistance to Mississippi Emergency Management Authority as needed

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## Proposed Projects

Proposed GIS projects and activities include:

- ★ Hosting and support of GIS efforts for:
  - ⊙ Mississippi GIS Clearinghouse
  - ⊙ Secretary of State
  - ⊙ Department of Archives and History
  - ⊙ Mississippi Development Authority
  - ⊙ Stimulus efforts for tracking and monitoring funds

## Benefits to the State

The GIS Enterprise Server provides state entities and local governing authorities with the following benefits:

- ★ The integration of GIS technology into business processes
- ★ Cost sharing for implementing the hardware, software, and technical staff to support the complex architecture that produces long-term savings because of economies of scale
- ★ A scalable, stable, readily available, and highly secure environment for application systems
- ★ Existing backup and recovery procedures plus annual testing of disaster recovery procedures
- ★ Mature systems management facilities
- ★ A secure physical environment with dual power sources and controlled environment
- ★ The availability of trained technical staff for future plans and designs

## ENTERPRISE MESSAGING SERVICES

### Description

Enterprise Messaging Services (EMS) within the State Data Center is comprised of two distinct services.

*Email Relay Services* is the delivery and receipt of electronic messages between state entities and across the internet. ITS provides an infrastructure composed of hardware and software that can provide secure messaging services across the state infrastructure.

*Hosted Messaging Solution* includes a Microsoft Exchange messaging platform providing email mailboxes directly to state entities. The Hosted Messaging Solution is an enterprise class messaging environment providing email, calendaring, shared folders, electronic archive, mobile device connectivity, mailing lists, etc. on secure, highly available platforms.

### EMAIL RELAY SERVICES HARDWARE AND SOFTWARE

#### Hardware

- ★ VMWare Virtual Servers – Red Hat ES
  - ⊙ Internal mail relay servers (inter-agency and outbound)
  - ⊙ Intrastate virus detection
  - ⊙ TLS encryption
- ★ 2-IBM Blade Servers – Red Hat ES
  - ⊙ Internal mail relay servers (inter-agency and outbound)
  - ⊙ Intrastate virus detection
  - ⊙ TLS encryption
- ★ 1 VMWare Virtual Server – Red Hat ES
  - ⊙ Internal fallback relay (queues mail for unreachable servers)
  - ⊙ Emergency internal mail relay server (inter-agency and outbound)

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- ⊙ Intrastate virus detection
  - ⊙ TLS encryption
  - ★ 2–VMWare Virtual Servers – Red Hat ES
    - ⊙ External mail relay servers (inbound gateway)
    - ⊙ Spam and virus detection, email quarantine
    - ⊙ TLS encryption
  - ★ 2–IBM Blade Servers – Red Hat ES
    - ⊙ External mail relay servers (inbound gateway)
    - ⊙ Spam and virus detection, email quarantine
    - ⊙ TLS encryption

#### **Software**

- ★ 9–Red Hat operating system software licenses
- ★ Sophos PureMessage for Unix (all relays - 20,000 seats)

### ***HOSTED MESSAGING SOLUTION HARDWARE AND SOFTWARE***

#### **Hardware**

- ★ 4–VMWare Virtual Servers – Windows 2008R2
  - ⊙ Exchange 2010 Servers
  - ⊙ Modular growth design, high availability cluster
  - ⊙ Mail client and mobile client connectivity and webmail interface
  - ⊙ Virus detection
  - ⊙ SSL/TLS encryption
- ★ 2–VMWare Virtual Servers – Windows 2008R2
  - ⊙ NearPoint Archive server and Microsoft SQL 2008R2 server
  - ⊙ Compliance-based mailbox archive for Exchange
- ★ 1–VMWare Virtual Servers – Red Hat ES
  - ⊙ Mailman Listserv server
- ★ IBM 8300 SAN
  - ⊙ Message store for Exchange messaging server
  - ⊙ Message store for NearPoint archive server
- ★ IBM 6040 NAS
  - ⊙ Message store for Exchange messaging server
  - ⊙ Message store for NearPoint archive server

#### **Software**

- ★ 6–Windows 2008R2 Data Center operating system software licenses
- ★ Sophos PureMessage for Exchange

### ***SERVICES PROVIDED***

ITS currently provides the following services under the EMS umbrella:

- ★ Relaying of mail
- ★ Virus scanning of all inbound, outbound, and intra-state email
- ★ Spam filtering of all inbound email
- ★ Hosting of email on Exchange 2010
- ★ Enterprise calendaring
- ★ Mail, Calendar, Contacts, and Tasks syncing with mobile devices
- ★ ListServ mailing list server

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## **Proposed Projects**

- ★ Instant messaging and presence integration
- ★ Web conferencing
- ★ Voice/video communication and conferencing
- ★ Statewide directory service

## **Benefits to the State**

State agencies will benefit from the use of the infrastructure in the following ways:

- ★ 24-hours a day, 7 days a week, 365 days a year operations
- ★ Redundant servers
- ★ SAN message store
- ★ Web and mobile device access to mailbox
- ★ Secure environment
- ★ Backup and recovery

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# NETWORK DOMAIN-VOICE

## STATEWIDE VOICE COMMUNICATIONS NETWORK

### Description

Statewide voice communications is provided for state entities and local governing authorities within the Capitol Complex, the greater Jackson area, and across the state through a variety of communications services. AT&T providing access to the Public Switched Telephone Network (PSTN) for local and long distance calling through premises based PBX trunking, business lines, and Centrex services statewide.

Centrex is a central office based voice communications system that provides many of the features and functionalities of a Private Branch Exchange (PBX) or Key Telephone System (KTS) without large capital investments. Centrex services are currently available in 65 cities including: Tupelo, Oxford, Columbus, Starkville, Greenwood, Meridian, Jackson, Hattiesburg, McComb, Gulfport, Senatobia, Laurel, Vicksburg, Pearl, Greenville, Grenada, Picayune, Natchez, Biloxi, Brookhaven, Columbia, Hazlehurst, Tunica, New Albany, Corinth, Batesville, Mendenhall, Canton, Cleveland, Brandon, Iuka, Magnolia, Hernando, Yazoo City, Newton, Louisville, Kosciusko, Pontotoc, Raymond, Wiggins, Boonville, Clarksdale, Madison, Morton, Magee, West Point, Aberdeen, Waynesboro, Lucedale, Holly Springs, Collins, Dekalb, Euporia, and Philadelphia.

Voice communications in the Capitol Complex is provided through a centrally managed S8700 Series Communications Server (PBX). This system operates in a networked environment via remote servers on site at the following locations: Department of Transportation; Department of Public Safety; Department of Environmental Quality; Department of Human Services; Department of Health; E&R Complex; the Sillers Building; the Woolfolk Building; Agriculture and Commerce; Secretary of State; Veteran's Home Purchasing Board; Gaming Commission; and the Department of Wildlife, Fisheries, and Parks. Nearly forty agencies have access to this system via this network.

### *HARDWARE AND SOFTWARE*

#### Hardware

- ★ 2–Fully redundant S8700 Series Communications Managers
- ★ 36–expansion port nodes
- ★ 1–Message Manager Voice Mail Server
- ★ Peripheral servers providing administrative and support functions

#### Software

- ★ Centre Vu CTCV
- ★ AVAYA's Integrated Management (AIM) software suite
- ★ AT&T's ECAS/DCAS telephone management software
- ★ AT&T's ccConnect service request entry software
- ★ MySoft telecommunications management software

### *SERVICES PROVIDED*

- ★ Local access provided through PBX trunking, Centrex, and business lines for remote office locations statewide
- ★ Local, intrastate, interstate, and international calling provided through the state's voice communications network
- ★ Universal authorization codes that verify long distance calling by assigning a unique

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- authorization code to each state employee and allows a person to place a long distance call from any state-managed phone statewide (beneficial for state employees traveling to a remote office)
- ★ Toll free numbers provided to an agency's customers to support agency business at a cost-effective rate
  - ★ Voice Mail provided through either AT&T's Memory Call service or through the state's Message Manager voice mail system for customers in the Capitol Complex to efficiently manage telephone messages for state employees
  - ★ Web based Message Manager a PC based software application for enhance a Capitol Complex employee's use of the Message Manager Voice Mail System
  - ★ On-demand assistance via call center applications to Capitol Complex customers for telecom services such managing high call volumes while reducing operating and maintenance costs, provided by call center applications
  - ★ Various types of call center employee productivity reports for Telecom Services customers using the software application Centre Vu Supervisor
  - ★ Audio, web and event conference calling at affordable contracted rates
  - ★ Detailed billing, provided through a comprehensive monthly bill designed to assist agencies with managing their telecommunications charges through itemized call detail and inventory reporting at the individual user level

### **Proposed Projects**

The following projects are planned to enhance the state's voice communications infrastructure:

- ★ Relocate voice communications host processors that serve the Capitol Complex to the new State Data Center
- ★ Develop new unified communications offering by integrating voice mail capabilities into the enterprise email system
- ★ Deploy real-time IP based services like IP Video and Voice over IP (VoIP) technologies, where appropriate
- ★ Continue to migrate the state's business line customers to Centrex services
- ★ Implement E911 directory services for Capitol Complex
- ★ Implement Session Initiation Protocol (SIP) for communications devices and local trunking access within the Capitol Complex telephone system
- ★ Evaluate the economic and feature benefits of migrating remote office locations from traditional telephone services to hosted VoIP managed services
- ★ Continue to reduce, through consolidation, the number of vendor bills paid by the state and those sent to our customers for telecommunications services

### **Benefits to the State**

State agencies benefit from using the state's voice communications infrastructure in the following ways:

- ★ Superior telecommunications services to the Capitol Complex and across the state, including a manageable and cost-effective communications infrastructure
- ★ Centralized management of all telecommunications services
- ★ Consistent, reliable, and cost effective telecommunications services statewide
- ★ Itemized call detail and billing
- ★ 24-hours a day, 365 days a year access to voice applications, services, and trouble reporting
- ★ Reduce the administrative cost of processing telecommunications bills by consolidation
- ★ Provide an audit process to ensure the best possible rates for telecommunications services
- ★ Provide and maintain a more accurate inventory of telecommunications facilities statewide

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# NETWORK DOMAIN - DATA VIDEO

## STATEWIDE DATA COMMUNICATIONS NETWORK

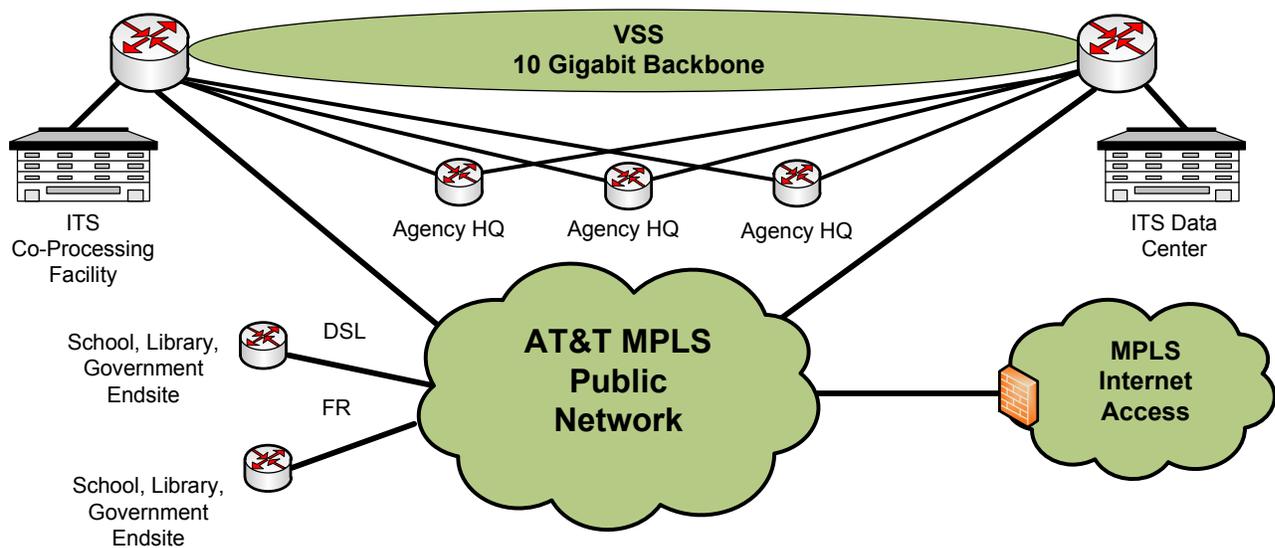
### Description

In 2005, AT&T was awarded the contract for telecommunication services which included the data network products and services to enable the state to migrate from the legacy Statewide Frame Relay/ATM Backbone Infrastructure to new technology utilizing Multi-Protocol Label Switching (MPLS). Today, this network facilitates a secure, redundant, high performance wide area network architecture utilized by state government, universities, libraries, K-12 schools, and local governing authorities. The contract allows for all products and services to facilitate the co-existence of all governmental entities on the network with multiple options for connectivity, performance, and quality of service. Although BellSouth was purchased by AT&T in December 2006, the contract remains intact for all contracted services as well as provisions to add new and enhanced services to meet the specific needs of the State.

As part of the implementation of MPLS infrastructure in Mississippi, AT&T provides, at no additional cost to the state, firewall, intrusion prevention, and filtering services at the Internet access point to the state's network. These offerings allow customers the flexibility to utilize these services, yet avoid the cost associated with these services and products at each site they have on the network.

Some of the current applications on the statewide network are:

- ★ LAN/WAN interconnection
- ★ High speed image transfer
- ★ Host-to-host data transfers
- ★ Client/server applications
- ★ TN3270 applications
- ★ Statewide E-mail
- ★ Supercomputing access
- ★ Remote systems management
- ★ Intranet web based applications
- ★ Internet access, services, and web based applications
- ★ Voice IP trunking
- ★ Voice over IP
- ★ H-323 IP-based video
- ★ GIS
- ★ Telemedicine




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## Logical Wide Area Network Diagram

### METRO AREA FIBER NETWORK

#### Description

The Metro Area Network (MAN) is an infrastructure component that supports high speed data, voice, and video connectivity for all major state government buildings in the Capitol Complex, the Education and Research (E&R) Complex, as well as buildings along the diverse fiber paths between the two core network hubs. The infrastructure includes fiber connectivity within and between buildings plus the necessary routing and switching hardware. The resulting fiber network provides both redundant and resilient access to the State Data Center (enterprise servers, E-Government portal, and the State Voice Communications Platform), local and long distance voice network, and the Internet by utilizing Virtual Switching System (VSS) architecture. The MAN is also a gateway to other agency sites statewide via the AT&T Multi-Protocol Label Switching (MPLS) network.

#### HARDWARE

- ★ 2 Carrier class routers
- ★ 2 Enterprise High Capacity Layer 3 switches
- ★ 2 Enterprise Highly Resilient Layer 3 switches
- ★ Redundant security infrastructure (Firewall, VPN, and IPS)
- ★ Multiple workgroup switches for the State Data Center Network
- ★ State owned fiber connecting agencies in the MAN via Ethernet (from 100Mbps to 10 gigabits)

- 
- ⊙ Department of Transportation HQ building
  - ⊙ Department of Transportation Lab building
  - ⊙ Walter Sillers building
  - ⊙ Department of Corrections building
  - ⊙ New Capitol building
  - ⊙ Woolfolk building
  - ⊙ Governor's Mansion fiber connecting Woolfolk building
  - ⊙ Department of Human Services building
  - ⊙ Department of Health building
  - ⊙ Natural Science Museum
  - ⊙ University of Miss. Medical Center
  - ⊙ Department of Public Safety building
  - ⊙ Department of Agriculture and Commerce - Ag Museum building
  - ⊙ Workers Compensation Commission building
  - ⊙ Institutions of Higher Learning building
  - ⊙ Public Broadcasting building
  - ⊙ Library Commission building
  - ⊙ Department of Wildlife, Fisheries, and Parks building
  - ⊙ School for the Deaf/Blind
  - ⊙ Heber Ladner building (Secretary of State)
  - ⊙ Secretary of State building (North President St.)
  - ⊙ Department of Education building
  - ⊙ Department of Archives and History building
  - ⊙ Department of Agriculture and Commerce HQ building
  - ⊙ Public Employees' Retirement System building
  - ⊙ Ethics Commission building
  - ⊙ Robert E. Lee building
  - ⊙ Robert G. Clark, Jr. building
  - ⊙ Department of Environmental Quality (Amite Street)
  - ⊙ Department of Environmental Quality (North State Street)
  - ⊙ 660 North Street building
  - ⊙ 620 North Street building
  - ⊙ New ITS Data Center and Office building (E & R Complex)

### ***SERVICES PROVIDED***

- ★ TCP/IP Communications and Addressing
- ★ Virtual Route Forwarding and Private VLANs
- ★ H.323 Video Services
- ★ SNA encapsulation and emulation
- ★ Domain Name Services (DNS)
- ★ Mail Server Resources
- ★ Network Monitoring, Management, and Reporting
- ★ Internet Access and Related Services

### **Proposed Projects**

- ★ Expand core network architecture to support virtual server and storage environments. The integration will provide the same level of redundancy and resiliency within the two centers as provided on the fiber network.
- ★ Installation of 10 gigabit network access into state government buildings, as required. Several agencies are requesting bandwidths above 1Gbps for application and Internet access.

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- ★ Evaluate agency needs for a centralized IP videoconferencing bridge for remote office training, reduced travel expenses, and virtual meeting capabilities.

### **Benefits to the State**

- ★ Access to a managed, high bandwidth, fully redundant, multi-protocol network connected to any state resource
- ★ Access to a secure managed network, taking advantage of the technology investment implemented within the MAN
- ★ Lower overall costs due to the economies of scale of a shared infrastructure
- ★ Expanded functionality to facilitate disaster recovery and co-processing of information and services

## **MISSISSIPPI'S RESEARCH NETWORK**

### **Description**

The Mississippi Research Consortium's (MRC) purpose is to develop and sustain nationally competitive research programs in the State of Mississippi. Formed in 1986, the MRC includes Mississippi's four research universities: Jackson State University, Mississippi State University, the University of Mississippi, and the University of Southern Mississippi. The organization has received praise from the National Science Foundation and others, and has been cited as a national model for how to best form a state science and technology infrastructure.

The primary goals of the MRC are to:

- ★ Develop a research infrastructure to support education and extend technology development in Mississippi.
- ★ Foster research funding opportunities and increase interaction with federal agencies.
- ★ Develop and share resources.
- ★ Improve science education opportunities for students elementary through college.
- ★ Make the most of human potential and provide technical assistance.
- ★ Enhance economic opportunities for the State of Mississippi.

For several years the MRC has sought support for the build-out of a research network within Mississippi, much like their peers in other states. The research universities have also extended their reach to other possible research entities including the Stennis Space Center, the University of Mississippi Medical Center, the Memphis Coalition for Advanced Networking, and the Engineering Research and Development Center at the US Army Corps of Engineers in Vicksburg, MS. The primary purpose of this network for the MRC is to provide the research entities with a high-performance, high capacity optical network with access to national research networks such as Internet 2 and National LambdaRail (NLR) as well as to enhance and encourage collaboration within Mississippi.

During the 2010 Legislative Session support was garnered by Governor Haley Barbour to build out a research network. Language in Senate Bill 3184 of 2010: Section 28 provided the opportunity for the state's research entities to participate in a research network initiative. The legislation authorized the Governor to issue to a telecommunication enterprise that has contracted with the state to provide broadband telecommunications service to institutions of higher learning, a payment credit voucher in lieu of an equal amount of cash payment. The payment credit voucher entitles the telecommunications enterprise to a credit against their aggregate tax liabilities in an amount that is equal to the payment credit voucher. The tax credit in lieu of payment was only authorized if agreed to by the telecommunications enterprise and authorized by the Governor with a signed payment credit voucher. The total amount of tax

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credit authorized under this bill in any fiscal year cannot exceed \$2,000,000.00. This legislation is good through June 30, 2018. As a result of this legislative action and support from Governor Barbour, AT&T Corporation was selected as the telecommunications enterprise because of their existing statewide telecommunications contract with the state, and initial designs were discussed, based on criteria established by the universities in earlier documents. Over the next several months ITS negotiated design changes and contract terms that led to the design that is being deployed today.

Today's design consists of two diversely routed 10 Gig Ethernet connections (providing a total of 20 Gigs of capacity) into each research location. From those locations the connections are diversely routed to two separate points on the 10 Gig fiber ring in Jackson, the State Data Center and the equipment room at the Woolfolk Building. From those diverse connections there will be two 10 Gig connections routed to the Louisiana Optical Network Initiative (LONI) point-of-presence (PoP) in Jackson where access to Internet II, NLR, and Commodity Internet are currently being provided to the universities. There are currently conversations taking place with Internet 2 about placing a PoP in Jackson, MS. If this happens, it will allow the state to become a direct Internet 2 Connector which provides the universities with additional redundancy, more direct access to research partners, and voting rights as part of the Internet 2 community. The Mississippi universities today have access to Internet 2, but they are missing out on the additional rights, opportunities, and prestige that comes with being a voting member.

The collaboration, cooperation, and involvement on this project have been somewhat unprecedented in Mississippi. The participants on this project included:

- ★ The Governor's Office
- ★ AT&T Corporation
- ★ Mississippi Research Consortium (MRC)
- ★ Research University CIO's
- ★ Research University Technical Staff
- ★ The Stennis Space Center
- ★ Engineer Research and Development Center (ERDC)
- ★ Louisiana Optical Network Initiative (LONI)
- ★ Internet 2
- ★ Information Technology Services (ITS)

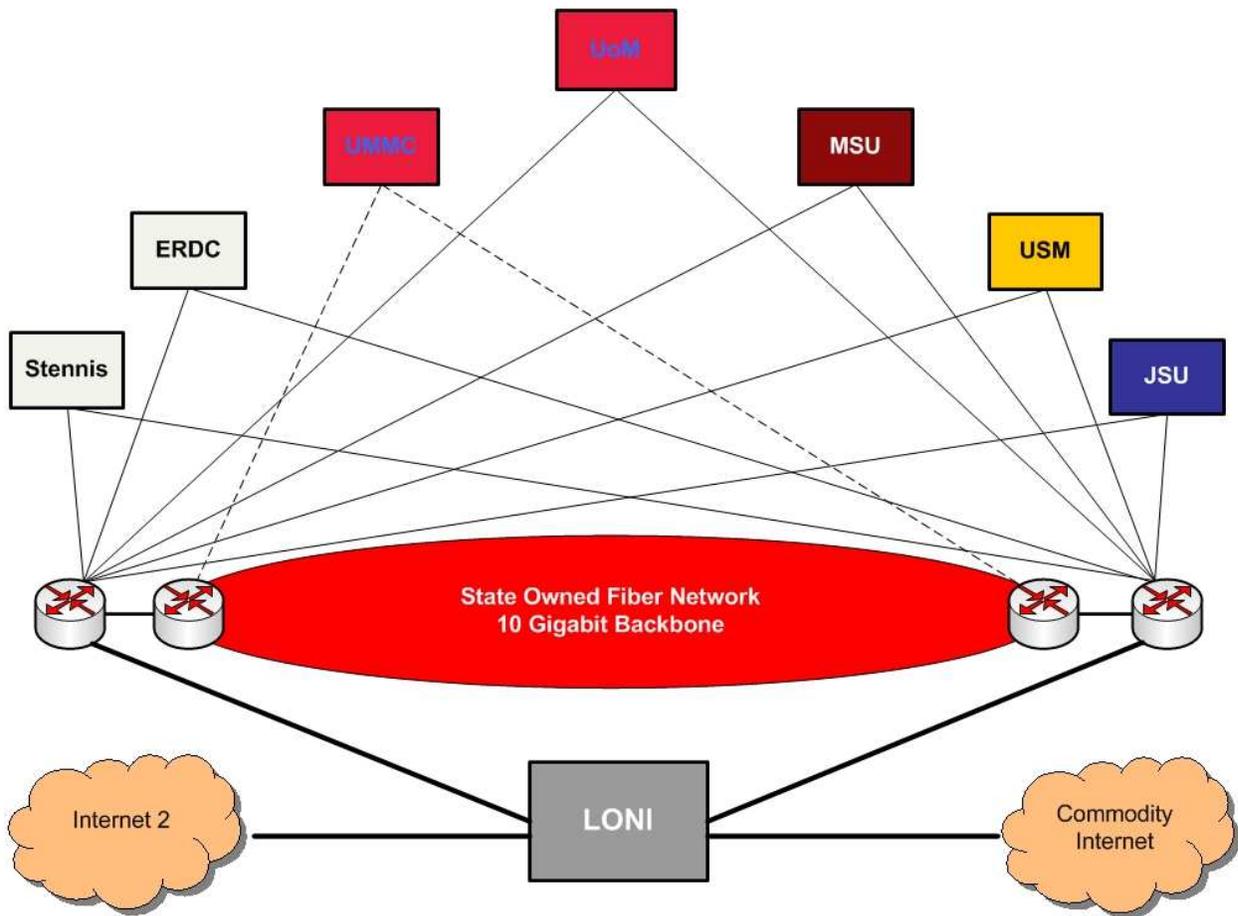
In order to facilitate the build-out of this network a contract amendment was drafted to the existing statewide contract with AT&T to add the requisite telecommunications products and services. The resulting amendment and related services are far beyond what the universities have today as well as the designs that were initially discussed.

The design that has resulted from the months of discussions, negotiations, engineering studies, and design changes has resulted in a network design that:

- ★ Increases capacity for the universities from 1 Gig to 20 Gigs
- ★ Provides redundancy from the research entity to the Internet 2 connection
- ★ Provides flexibility for changes in Internet 2 providers
- ★ Allows for collaboration between the research universities and the state network
- ★ Provides opportunities for disaster recovery capabilities between entities
- ★ Allows the state to use university volumes in negotiating future contracts
- ★ Helps Research Universities compete for Research Grants/Funds
- ★ Helps promote economic development both regionally and statewide
- ★ Allows for more collaboration of research entities statewide and for sharing of resources statewide

- ★ Exposes our students to opportunities they might not otherwise have
- ★ Helps recruit the best and brightest researchers to Mississippi
- ★ Helps to expand telecommunications infrastructure and technology to all parts of Mississippi

This research network will be called the Mississippi Optical Network (MissiON), and will provide the research infrastructure to allow the State of Mississippi to foster new educational opportunities and to keep Mississippi's research universities nationally competitive among peer institutions and agencies. With the appropriate contractual amendments in place, it is anticipated that the MissiON network will be built and implemented during calendar year 2011.



**Research Network Diagram**

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## INTERNET ACCESS

### Description

Internet access is provided via a contract with AT&T who serves as our current Internet Service Provider (ISP). The current contract provides statewide dedicated Internet access via the AT&T Multi-Protocol Label Switching (MPLS) network.

Internet access has a large impact on the statewide network, primarily from the educational entities within the state. State agencies and other institutions use the network for communications with other state entities such as the State Data Center as well as for Internet access. Educational entities, however, use the network primarily to facilitate access to the Internet.

The primary mode of access to the Internet is through leased circuits connecting to the AT&T MPLS network. However, there are other access points including broadband, dial-up, and the Metro Area Network (MAN) in Jackson. Access to the Internet for all state entities is currently provided over the MPLS network with an aggregate capacity of 3.063 gigabits provisioned for the State of Mississippi.

### SERVICES PROVIDED

Listed below are the services offered by ITS and/or AT&T associated with Internet access. State entities and local governing authorities can take advantage of these services to provide access to their Internet users, or they may elect to configure their own Internet servers that will reside on the MAN or the MPLS network.

- ★ E-mail
- ★ Web services including [www.ms.gov](http://www.ms.gov)
- ★ Domain Name Services (DNS)
- ★ Security services, including firewalls, authentication servers, VPNs, and IPS
- ★ Internet mail relay, virus protection, and SPAM filtering
- ★ Content filtering, management, and reporting

Agencies not connected to the MAN or the AT&T MPLS networks that need Internet access, may find it more economical to obtain services from a local Internet Service Provider (ISP). Agencies that want to pursue this alternative may be able to acquire these services through a state contract. All requests for these services must be directed to ITS. If an alternate ISP is acquired, access to state resources through the Internet must be obtained utilizing a Virtual Private Network (VPN).

### Proposed Projects

- ★ Provision new Managed Internet Services (MIS) for customers in the Capitol Complex. The demand for Internet access to support web-based applications continues to grow. The next phase is to migrate away from the current MPLS-attached Internet design to a dedicated connection for customers within the Capitol Complex.

### Benefits to the State

- ★ A very high speed, dedicated access to the Internet (The limiting factor is normally the local access circuit.)
- ★ A highly scalable solution for all participants
- ★ A low cost solution based on economies of scale and volume purchasing from the vendor
- ★ Security services (firewall, IPS, filtering) included with MPLS Internet access

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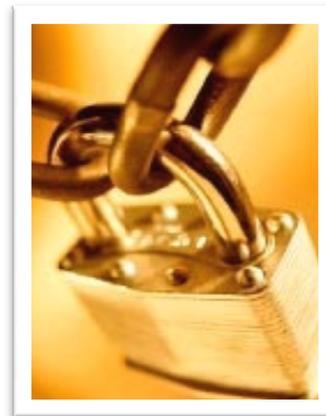
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# SECURITY DOMAIN

## INFRASTRUCTURE SECURITY

### Description

Information security continues to be a major consideration today in the development of mission critical applications and systems for state government. The IT professional responsible for making those complicated IT decisions must consider the security implications relative to the platform, the data classification, the access requirements, the application, the connectivity requirements, and both agency and enterprise policy and procedures when evaluating the alternatives to deploy. More than ever, the information security environment demands a layered approach to properly address the known vulnerabilities and threats as well as those yet to be identified or conceived. It takes a focused effort to ensure that the information assets that we are responsible for protecting are provided with the best possible environments to operate under.



The Information Security Division (ISD) of ITS has developed and maintained the Enterprise Security Policy and the Enterprise Security Plan to provide direction and guidance for state agencies as they work to improve their individual agency security posture. The following products, services and projects are ISD's responsibility to document, coordinate, facilitate, manage, or implement as we continue to provide support to the agencies through communications, core security infrastructure, contracts, and consulting resources.

### *HARDWARE AND SOFTWARE*

Each infrastructure component has security elements as described below:

#### State Data Center Physical Facilities

- ★ Security cameras at strategic locations with all activity monitored and archived
- ★ Card access control system with biometric scanners as needed
- ★ Lockable racks and the capability to separate and cage racks and equipment
- ★ 24/7/365 Facility and grounds security officer for monitoring physical access, especially after hours and weekends.

#### Enterprise Server Component

- ★ Security server that includes Lightweight Directory Access Protocol (LDAP) server, network authentication service, and firewall technologies
- ★ Cryptographic services that include a system secure sockets layer (SSL) and the integrated cryptographic service facility
- ★ Protection for mainframe source modules, run-time modules, and data sources through the security server Resource Access Control Facility(RACF)

#### E-Government Infrastructure (state portal)

- ★ Access manager that includes proxy server, LDAP directory services, access control, and SSL
- ★ Transport Layer Security (TLS) encryption on mail relays
- ★ Mississippi Interactive – Facilitating infrastructure, security, and coordination of services in a dedicated DMZ with controlled access from the state network and only VPN access from the Internet.

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## Network Security

- ★ Multiple perimeter and data center firewall implementations
- ★ An access control server that utilizes single-use, one-time passwords, and two factor authentication to enforce access and authentication policies for networking systems and components
- ★ An Intrusion Prevention System (IPS) that provides enterprise detection, reporting, and termination of unauthorized activity
- ★ Virtual Private Network (VPN) connectivity for the implementation of IPSec Virtual Private Networks and qualified SSL clients to secure connectivity of untrusted third parties to state resources as well as access to the state network by remote state employees
- ★ Access control list at the switch and router level to protect agencies by stopping propagation of worms, viruses, and other threats
- ★ Security management and reporting system to monitor IPS events, firewall logs, and VPN concentrator logs for potential security threats

## ***SERVICES PROVIDED***

- ★ Protection of applications and data from unauthorized users
- ★ Network monitoring with long-term statistical reporting
- ★ Secure physical environment around core infrastructure
- ★ Network address translation services
- ★ Preventing Internet users from accessing non-Internet related platforms
- ★ Preventing Internet users from accessing Internet related platforms with unauthorized IP protocols
- ★ LDAP services
- ★ Secure authentication services
- ★ Intrusion prevention services
- ★ The capability of using VPNs, SSL, cryptographic services, and digital signatures
- ★ Event correlation to determine network security issues
- ★ Maintenance of enterprise security policy and plans
- ★ Development of templates to be used for the security assessment scope of work, agency security plans, compliance letters, reporting forms, etc.
- ★ Establishing and maintaining security specific contracts for products and services
- ★ Developing ongoing education and awareness programs for security officers and users
- ★ Providing awareness training directly to agency staff or to agency trainers
- ★ Coordinating and assisting with agency security assessments and remediation plans
- ★ Coordinating core security assessments and related remediation efforts
- ★ Coordination of security monitoring services and event notification to the agency's
- ★ Maintenance of core data center and perimeter firewall systems
- ★ Development of a security council made up of agency representatives and hosting regular council meetings for discussion and review of security issues, policy, challenges, etc.
- ★ Establishing and maintaining communications mechanisms for use by agency security staff that include the security website, security listserve, cyber-security newsletter, and various customer meetings

## **Proposed Projects**

The following projects are planned to enhance infrastructure security:

- ★ Maintain the Enterprise Security Policy with updates as required
- ★ Maintain the Enterprise Security Plan and update annually with new enterprise initiatives
- ★ Maintain and enhance the ITS Information Security Division website
- ★ Coordinate and host quarterly State of Mississippi Security Council meetings

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- ★ Review and maintain statewide contracts for security products and services
  - ★ Plan and coordinate information security education and awareness programs
  - ★ Enhance the Intrusion Prevention System to distribute the IPS functions and provide high performance redundant monitoring of inbound and outbound network traffic
  - ★ Expand use of two-factor authentication to the portal and mainframe environments
  - ★ Evaluate the feasibility of hosting a wireless controller in the edge DMZ for use by ITS and other agencies to deliver wireless guest access
  - ★ Development and deployment of an automated incident reporting system
  - ★ Maintain core security management systems to add latest features and functions and increase capabilities for managing core security infrastructure
  - ★ Evaluate niche security products to enhance core security protections

### **Benefits to the State**

- ★ Secure environment covering physical facilities, networks, and application platforms (data and applications)
- ★ Participation in a high performance resource that limits the risk and vulnerabilities that are inherent in both public and private networks today
- ★ Participation in an environment that provides services and support to assist agency staff in securing the information assets they are responsible for protecting and managing every day
- ★ Participation with national partners such as the Multi-State Information Sharing and Analysis Center (MS-ISAC), which is funded by the Federal Homeland Security Office, United States Computer Emergency Readiness Team (US-CERT), and Government Forum of Incident Response and Security Teams (GFIRST), as well as the FBI InfraGuard Chapter

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# ENTERPRISE MANAGEMENT DOMAIN

## INFRASTRUCTURE DISASTER RECOVERY

### Description

Every year more and more areas of state government become dependent on computerized data and on the networks that allow data to be distributed across the state. It has become critical to recover quickly from all forms of disaster that could affect computer hardware, software, data, and networks. In the event of a disaster, we must be able to bring significant infrastructure components back online and make them operational as soon as possible. The sophistication and complexity of today's technologies have increased the complexity of the solutions for disaster recovery needs. ITS recognizes the need for a strong disaster recovery plan. Each year more infrastructure components are added to the list of hardware and software that is tested during our annual disaster recovery test. An infrastructure disaster recovery plan is updated annually and distributed to participants in the disaster recovery testing.



ITS, MDHS, Medicaid and the Mississippi Department of Employment Security (MDES) currently have a contract with IBM Business Recovery Services to facilitate a recovery should a significant disaster strike. The coverage includes:

- ★ Six weeks of hot-site access
- ★ Six months of cold-site access
- ★ Mainframe capacity to handle both ITS customers and MDHS
- ★ Mainframe peripherals such as disk storage, tape drives, and printers
- ★ Open Systems capacity to handle mission-critical UNIX and Windows applications including E-mail services
- ★ Routers, switches, and channel extenders to switch the Metro Area Network and Statewide Frame Relay/ATM Backbone Network to the hot-site
- ★ Reserve DS1s and Internet VPNs to connect to the hot-site
- ★ Mail processing facilities to print and process for mailing, important documents such as checks for MDHS
- ★ Internet access

### **SERVICES PROVIDED**

Presently, ITS provides these disaster recovery services:

- ★ Adequate disaster recovery facilities for all mainframe applications
- ★ Adequate network access to the disaster recovery facilities for mainframe applications should a disaster strike the State Data Center
- ★ Disaster recovery for the networking infrastructure should a disaster strike any building within the Metro Area Network (MAN)
- ★ A disaster recovery plan that is distributed to customers and can be used as a guide for agency disaster recovery planning
- ★ Annual disaster recovery testing

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## Proposed Projects

The following projects are planned to improve ITS' ability to provide infrastructure disaster recovery:

- ★ Acquire a new business recovery services contract to 1) support enterprise server recovery, 2) update configuration and add equipment for recovering additional E-Government applications, E-mail applications, and GIS infrastructure, 3) add individual agency servers as requested by customer agencies, 4) add the virtual tape system, and 5) to enhance virtualization recovery support features
- ★ Research options for creating a state-owned disaster recovery facility or facilities (as an interim solution, remote tape vaulting and replication of critical data to remote disk storage subsystems will be considered)

## Benefits to the State

Value added disaster recovery services now provided in the following ways:

- ★ Extensive disaster recovery services
- ★ Annually tested disaster recovery plans
- ★ Periodically updated disaster recovery procedures which include new platforms and applications
- ★ Restoration of data processing for the State Data Center applications in 48-96 hours should a localized disaster occur

# INFRASTRUCTURE ADMINISTRATION

## Description

An infrastructure that is as complicated as the State of Mississippi's requires a level of administration that is responsive, efficient, and effective. With much of the business of the state becoming increasingly dependent on the E-Government platform, Metro Area Fiber Network, and statewide networks, it is imperative that the business be supported by timely and well conceived plans for administering, monitoring, and managing the components.

The function of network management is carried out by a group of trained network technicians stationed in the central Network Operations Center (NOC). Network support is a twenty-four by seven operation that provides help desk support, technical troubleshooting, network performance monitoring and tuning, coordination of new site installations, and planning for major network expansions and technology migrations.

Currently, many different state entities are performing Level-1 troubleshooting for their respective customer bases. Level-1 support means handling those problems that are common, easily addressed, and for which handling procedures already exist. Level-2 support means handling those problems that are uncommon, complex, and often require a higher level of expertise. Examples include:

- ★ The Mississippi Department of Education provides Level-1 support for the 152 school districts. As the K-12 schools migrate to Multi-Protocol Label Switching (MPLS), they will acquire fully managed services from AT&T.
- ★ The Library Commission provides Level-1 support for all public libraries. As the Library Commission migrates to MPLS, they will acquire fully managed services from AT&T.
- ★ The State Board for Community and Junior Colleges provides Level-1 support for all community college campuses.
- ★ The Department of Public Safety provides Level-1 support for criminal information center sites.
- ★ Mississippi Public Broadcasting and community college staffs currently staff and support the video network control center and provide help desk, conference and class scheduling, and other technical functions for the H.320 video network participants.

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- ★ ITS provides Level-1 support for all other agencies and Level-2 support for the support groups listed above. Larger agencies may provide Level-1 support for their applications and networks. ITS provides Level-2 support in these cases.
  - ★ ITS has implemented state-of-the-art NOC hardware and software and is moving toward consolidation of network management for state agencies.
  - ★ The administration of the E-Government component and enterprise server component is also the responsibility of ITS personnel. Each of the infrastructure components has unique tools to aid in the proper management of the environment.

### ***HARDWARE AND SOFTWARE***

Most of the infrastructure components have administration and management elements included as software. These products for the enterprise server component and the E-Government component have already been listed. Because the network management environment is physically a distinct application environment, it is described below:

#### **Hardware**

- ★ Mixture of SUN and Microsoft servers

#### **Software**

- ★ CA - Network Health
- ★ CA - Spectrum
- ★ Visio
- ★ CA-Service Desk

### ***SERVICES PROVIDED***

Infrastructure administration includes the services listed below:

- ★ Monitoring of all the components of the infrastructure, 24-hours a day, 365 days a year
- ★ Collection and distribution of performance and usage data for all components
- ★ Collection of data for capacity planning and/or IT systems design
- ★ Billing and bill management
- ★ Help desk
- ★ Technical support on-call 24-hours a day, 365 days a year

### ***Proposed Projects***

The following projects are planned to improve infrastructure administration:

- ★ Integrate the telecommunication system and the new service desk
- ★ Enhance monitoring capabilities and user interfaces

### ***Benefits to the State***

- ★ Support for all infrastructure services, 24-hours a day, 7 days a week, 365 days a year
- ★ Access to performance, capacity, and billing data as needed
- ★ A secure environment
- ★ Controlled test and production environments

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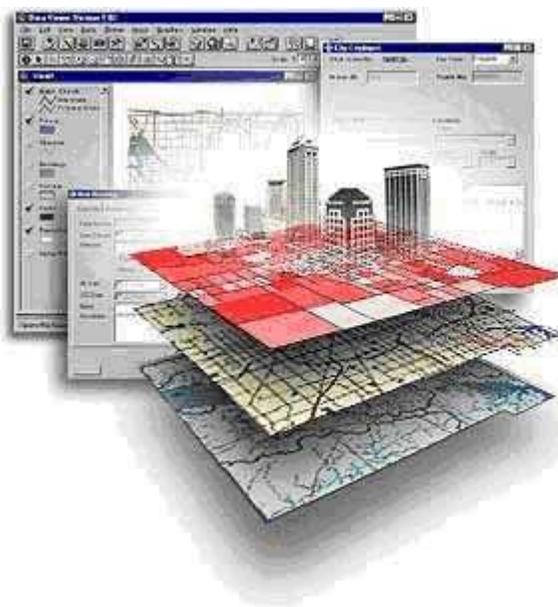
# TECHNICAL RESEARCH AND PILOT PROJECTS

## GEOGRAPHIC INFORMATION SYSTEMS (GIS)

The goal of the Mississippi Geospatial Clearinghouse (MGC) is to make the application of spatial information Geographic Information Systems (GIS) technologies within the state of Mississippi more efficient by eliminating the duplication of spatial data production and distribution through cooperation, standardization, communication, and coordination. This data, primarily the Mississippi Digital Earth Model (MDEM), provides the foundation for applications to be developed using GIS technology to meet the business needs of the governmental agencies and/or public interest. As noted in the Statewide Initiatives section of this document, ITS is continually focused on the development and enhancement of the MGC, as well as maintenance of GIS hardware and software procurement instruments for state agencies and local governing authorities. The projects described below are currently being developed and will leverage the MGC infrastructure:

### Architectural and Historic Structures

The State Historic Preservation Office (SHPO) of the Mississippi Department of Archives and History (MDAH) has been tasked with developing a GIS based system that will map archaeological sites, National Register properties, and above ground historic resources that are situated within the disaster areas defined by Presidential Declaration FEMA-1604-DR and its amendments. This system should improve the public's knowledge about the range and extent of historic and prehistoric sites within the Mississippi Gulf Coast Region and will provide the SHPO with a new tool to better evaluate and manage these cultural resources.



The Architecture and Archaeology divisions of MDAH are currently managing information about historic places in slightly different ways. The level of completeness with regard to this information is different for each division. The opportunity exists to bring the information in both divisions to the same completion level and provide management of this information through a common interface. The daily maintenance of these combined records management systems will be housed at the State Data Center. This electronic data will have support and can be accessed twenty-four hours a day, seven-days a week. In addition, all upgrades and maintenance to the combined records management systems will be performed by ITS staff which will free resources at MDAH.

Once completed the proposed system will provide a tool for the staff of MDAH to add and maintain records, create reports, perform research, perform cross-divisional regulation tasks, and provide for the easy review of historic building surveys.

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## **Archaeology and Historic Sites**

The State Historic Preservation Office (SHPO) of the Mississippi Department of Archives and History (MDAH) has been tasked with developing a website to publish the rich, but not well-known archaeological history of Mississippi. This project intends to educate the citizens of Mississippi about their archaeological heritage through an interactive website that includes virtual tours of archaeological sites. The website will reach citizens as well as teachers, students, and professionals. The website will include key sites in the Mississippi coastal area but will be designed to include information statewide when available. The virtual tours will guide users to experience historic sites that are now non-existent or inaccessible. The site will also guide users, through the use of podcasts and downloadable content to visit actual sites.

## **Small Community Assets**

The Asset Development Group of the Mississippi Development Authority has been tasked with developing a GIS based system that will highlight the resources of small communities in Mississippi. MDA created the Asset Development Group to focus on non-traditional economic development opportunities unique to Mississippi. Such opportunities often require longer term development, guidance, vision and support. This system will showcase resources of small communities to the public. The site will provide tools to tourists, the film industry, and businesses. A tourism-focused application foundation will be created with expandable functionality and the ability to include program areas as data sources become available. The foundation will be an application that has all of the basic functionality that is necessary in any web-based mapping program. This will include multiple basemaps, keyword search, address search, zoom/pan, multimedia pop-ups and other basic functions. The foundation will be designed in a way to provide for the easy expansion of more complex functions such as a trip planner. Through the use of standard web feeds, like GeoRSS, the foundation can be designed to consume these feeds as they become available.

## **BioMass in Mississippi**

The Mississippi Development Authority (MDA)-Energy Division has selected a consulting group, Tetra Tech NUS, Inc. to develop a Biomass Feasibility Study for the State of Mississippi, which will be funded under the American Recovery and Reinvestment Act of 2009.

The Mississippi Biomass and Renewable Energy Council defines biomass as any non-fossil, energy containing a form of organic carbon and includes all land and water-based vegetation such as trees, aquatic and marine plants, crops, organic components of municipal solid waste, forestry and agricultural residues, animal wastes, and industrial wastes derived from any combination of those substances.

Mississippi has many naturally occurring substances that can be easily farmed that are natural biomass sources. Due in the fourth quarter of 2011, Tetra Tech NUS, Inc will provide a detailed study of these potential sources and how to best utilize them. This information will be provided in both a report format and geographic datasets. The datasets will then be imported into an interactive map viewer that will display detailed bases maps under the biomass layers. The biomass layers can be turned on or off to assist in the discovery of overlaps in investment potentials.

The foundation that will be used for the BioMass interactive map view is currently being developed for the MDA Asset Development Group project and includes the ability to show detailed street maps and aerial photography. There are also a number of tools that will be used for asset locating, including address search and Public Land Survey search, as well other tools such as annotating and printing maps. This project should be completed by January 2012.

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## VIRTUALIZATION

### Description

Like many organizations managing IT, the Mississippi Department of ITS recognizes that the key strategic initiatives for information technology energy management focus primarily on two approaches; implementing server and storage virtualization technologies as well as optimizing the physical IT server facilities and data centers. By definition, these approaches will require more time, effort, and up-front expenditures but also have the greatest potential for long-term and substantial energy savings across state government.

Virtualization is a technology that will allow consolidated devices to be partitioned so that one machine or storage device can run applications or store data for many agencies. Each agency would have its own discrete “virtual machine” while sharing a single physical device. Since server utilization in a typical IT shop averages 15%, virtualization allows one physical server to replace multiple devices and run many applications, regardless of the agency’s operating system and development platform. Even when operating at only 5% of capacity, a server uses 90% of allocated power. On average, a typical server uses 23.8 kilowatts per day. With cooling and power demands remaining continuous, even as servers are idle, nearly half of all operational costs for servers are expended on power and cooling needs. Thus, by streamlining the number of physical servers, floor space, cooling costs, and capital costs are reduced - lending to lower energy consumption while server utilization increases. For every ten servers virtualized, the expected savings in energy costs is roughly \$14,300 annually. Virtualization technology advances in server hardware, software, storage systems, and networks have provided significant opportunities to optimize IT systems.

In June 2010, Governor Haley Barbour requested ITS to employ the services of industry experts to perform an analysis of savings that can be achieved through server virtualization and storage consolidation in Executive Branch agencies. Since the review, several agencies have made the decision to move forward with the virtualization initiative and as a result have been delivered detail design documents. Several of these projects are scheduled to move forward with their virtualization projects before the end of the year.

The Mississippi Department of ITS has selected the VMware Enterprise environment as the standard for virtualization for all agencies in the State of Mississippi. The State of Mississippi expects that the server, storage, and desktop virtualization technology will continue to improve and develop which should provide continued opportunity for improved services and cost savings to the individual agencies and the State as a whole.

## WEB 2.0

Social media in government has grown considerably in the last couple of years. Agencies and departments are adding Facebook, Twitter, or YouTube to their websites as a means of providing real time communication to their public followers. Mobile devices have aided in the ease of receiving these updates. ITS has researched the growth of Web 2.0 and the use of social networking in government.

The term Web 2.0 describes a website that provides users with interaction and collaboration in a social media dialogue as creators of user-generated content in a virtual community. A contrast would be a



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website where users are limited to the passive viewing of content that was created for them. Examples of Web 2.0 include social networking sites, blogs, wikis, video sharing sites, hosted services, web applications, and mashups.

### **Really Simple Syndication (RSS)/GeoRSS Live Feeds**

RSS is a format for delivering regularly changing web content. Many news-related sites, weblogs, and other online publishers syndicate their content as an RSS feed.

Several state agencies in Mississippi already utilize RSS feeds to provide followers information on upcoming tourism events, traffic alerts and health related issues.

### **Social Networking**

A few examples of how Mississippi government is currently using the social networking technology are:

- The Mississippi Department of Transportation and the Mississippi Emergency Management Agency are utilizing Twitter as a way to notify citizens of procedures during an emergency such as hurricane contra-flow or for road closures due to construction.
- The Mississippi Department of Employment Security utilizes Twitter to post WIN Job Center openings and job training opportunities.
- The Mississippi Fire Academy uploads video to YouTube to promote fire safety and training opportunities.
- The Department of Environmental Quality has a Facebook page and utilizes Twitter to provide the public with the latest information on environmental incidents and efforts to respond to a crisis.
- The Mississippi Department of Wildlife and Fisheries has a Facebook page that provides the latest information on Mississippi's Parks, hunting regulations, boating and gun safety training, and license renewal.
- The Mississippi Division of Tourism uses Facebook Twitter, YouTube, and Flickr to post events throughout the state.
- The Mississippi Department of Public Safety uses Facebook to promote the Click It or Ticket Mississippi campaign.



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