ANNUAL REPORT September 2009

LEARN

LONESTAR EDUCATION AND RESEARCH NETWORK

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LEARN Member Institutions

Baylor College of Medicine **Baylor University** Lamar University Northeast Texas Consortium (NETnet) Prairie View A&M University Rice University Sam Houston State University Southern Methodist University Stephen F. Austin State University Texas A&M Health Science Center Texas A&M University Texas A&M University - Corpus Christi Texas A&M University System Texas Association of Community Colleges Texas Christian University Texas Education Telecommunications Network (TETN) Texas State University - San Marcos

Texas Tech University



Texas Tech University System
Texas Woman's University
University of Houston System
University of North Texas System
University of Texas - Pan American
University of Texas at Arlington
University of Texas at Austin
University of Texas at Dallas
University of Texas at El Paso
University of Texas at San Antonio

University of Texas Health Science Center at Tyler
University of Texas Health Science Center at Houston
University of Texas Health Science Center at San Antonio
University of Texas MD Anderson Cancer Center
University of Texas Medical Branch
University of Texas Southwestern Medical Center
University of Texas System



2009 Executive Committee



Chair: C. Van Wyatt Texas State University - San Marcos





Secretary: Marg Knox University of Texas System

Treasurer and Chair of Finance Committee:

University of Texas at Arlington



Chair Elect: Maurice Leatherbury University of North Texas System Baylor College of Medicine

Past Chair 2008:

Suzanne Montaque



Jenifer Jarriel



Chair of Governance and Participation Committee:

Sam Segran Texas Tech University

Chair of Operations and Services Committee:





Letter from the Chair

C. Van Wyatt Texas State University

On behalf of our Board of Directors, it is my distinct pleasure to present the 2009 edition of LEARN's Annual Report. We are delighted to report, during the past year we broadly expanded the reach and the scope of our network services throughout Texas, built important new partnerships with the private and public sectors, brought international recognition to Texas, and hired a new Executive Director to lead our organization in the coming years.



LEARN's 35 member Board of Directors includes leaders from our public and private institutions of higher education, community colleges, and K-12 public schools. The diversity of our membership and leadership of the Board have been essential to the success of our consortium. LEARN's accomplishments are a direct result of their support and vision to create a shared resource for the education and research communities in Texas.

It has only been six years since the concept of forming a high performance network organization like LEARN was originally envisioned. With the support of state government, our members, and partnerships with the private and public sectors, much has been accomplished in the past six years. We have deployed over 3,000 miles of optical network capacity throughout Texas. Our network now connects over 93% of the students in four year institutions of higher education and 58% of the students in higher education in Texas. Additionally, over 400 organizations throughout our state are now receiving the benefits of using LEARN's network enabled services. While these accomplishments are noteworthy, the most significant benefit of our consortium is the relationships and trust, which has been created among our diverse community.

LEARN is a part of a national community of interconnected regional optical networks throughout the United States. LEARN is also the connection point for Texas to the National LambdaRail and Internet2 national research and education networks. These regional optical networks and the national networks are linked to the international research and education networks and provide the global reach and collaborative environment, which are needed by our research and education colleagues. Because of the leadership Texas provides in these areas, we are able to bring recognition and economic activity to our state through our participation in global "big science" projects like the CERN Large Hadron Collider, and by hosting large national and international research meetings like Supercomputing 2008 and the 2009 Internet2 conferences.

LEARN has become a robust and vitally important asset for Texas. As a result of the partner-ships that have been forged, we have a proven record of accomplishment. However, much work remains if we are to meet the challenges and take advantage of the opportunities which lay ahead. Thank you for your interest in LEARN. We look forward to working with you on behalf of Texas.

Letter from the Executive Director

Mike Phillips LEARN

Our annual report provides us with a wonderful opportunity to highlight the collaborative nature of our members and partners, our accomplishments, current initiatives, and the value and recognition LEARN provides to Texas. As you will find in our report, during the past year we significantly expanded the footprint of LEARN's network



across Texas bringing network enabled services to areas with unmet needs, created new strategic partnerships, provided students, heathcare professionals and researchers with connectivity to high performance networks throughout Texas and the world, and played a leadership role in hosting thousands of the world's leading scientists, researchers and engineers at the Supercomputing 2008 conference in Austin.

During the past year, LEARN's network was extended from Dallas to Tyler and Houston to Beaumont. This expansion provides needed advanced network services to these communities and is an important step in our plans to provide connection points to our network throughout Texas. LEARN also deployed strategically important infrastructure in Dallas and Houston to connect LEARN's points of presence in these cities to key service providers to reduce cost, foster collaboration and expand services to our members. Additionally, in collaboration with state government, and the private sector, the size of LEARN's network doubled. As a result of this initiative, we added an optical network loop from Dallas though West Texas with points of presence in Lubbock, Midland, and San Angelo that connects back to our network resources in San Antonio. Expanding the reach and availability of our network is important. However, more importantly, throughout this report you will find examples of what LEARN has enabled our students, faculty, healthcare professionals, scientists, and researchers to accomplish.

Beginning with our organizational activities in 2003, collaboration has been the cornerstone of our efforts and accomplishments. This core value has served LEARN and its members well during our formative years, when we put the "first light" on our network in 2005, and now as a mature and robust organization. The vast majority of what we have accomplished is a result of partnerships, which have been forged between our members and their affiliated organizations, the private sector, government, and other regional, national and international networks.

Texas and our nation are poised to make significant investments in expanding the availability of broad-band services through the United States. We believe this is a timely and important initiative for our state and our nation. We appreciate the opportunity to serve on the Statewide Broadband Task Force, which has been appointed by Commissioner Staples. LEARN looks forward to continuing to collaborate with others to build the partnerships, which will be necessary to accomplish our broadband goals in Texas.

LEARN Overview & History

The Lonestar Education And Research Network (LEARN) is a consortium of 35 organizations throughout Texas that includes public and private institutions of higher education, community colleges, and K-12 public schools. The Consortium, organized as a 501(c)(3), connects these organizations, and over 400 affiliated organizations, together with high performance optical network services to support their research, education, healthcare and public service missions. LEARN is also a part of a national community of research optical networks, and provides Texas connectivity to the national and international research and education networks.

Creating LEARN

In 2003, a series of meetings were held to forge a shared vision concerning the value of creating a unifying high performance optical network for higher education in Texas. Despite the significant challenges that lay ahead, a consensus soon emerged among higher education leaders that it was strategically important to create an organization dedicated to high performance networking in Texas.

LEARN's Vision

To be the premier organization providing advanced network services for research, education, health care and economic development throughout Texas. LEARN will be a national model for organizations that serve institutions of higher education. We will provide leadership in creating global networking initiatives.

In the Summer of 2003, the Texas Legislature endorsed the concept of providing the initial investment of \$7.5 million dollars to construct the proposed optical network for Texas. The legislature also endorsed the concept of funding a \$2.5 million proposal to develop a grid computing collaborative among the five universities in the Texas Internet Grid for Research and Education (TIGRE). While both projects were authorized by the Legislature, the grants were to be awarded under the auspices of the Texas Enterprises Fund (TEF), if authorized by the Governor, Lieutenant Governor and the Speaker of the House.

In the Fall of 2003, it was decided to use the Texas GigaPoP as the 501(c)(3) structure for the new statewide organization that later became LEARN. In January 2004, the officers of the new organization were installed at a Board meeting on the Southern Methodist University campus in Dallas. The new organization was officially named "LEARN: Lonestar Education And Research Network". Therefore, at that meeting, LEARN was created with a 30 member Board of Directors.

During 2004, LEARN worked with the offices of the Governor, Lieutenant Governor, Speaker of the House and the Department of Information Resources (DIR) as they studied the merit of authorizing a TEF grant for the optical network project. In the Fall of 2004, the elected leadership offices announced that the State of Texas would support funding a TEF grant. The TEF grant provided the initial capital funds to acquire dark fiber and equipment or leased wavelengths for a "triangle" backbone connecting, Dallas, College Station, Houston, San Antonio and Austin with additional connections to El Paso, Lubbock, Denton, Tyler/Longview, Beaumont, Galveston and Corpus Christi.

On February 28, 2005, the Governor signed the TEF grant agreement to provide \$7.28 million in funding for the optical network project. LEARN now had the organizational, political and financial means to begin deploying the optical network for Texas.

Organization & Governance

LEARN's 35 member Board of Directors manages the overall affairs of the corporation. Committees of the Board have been formed to oversee specific areas of LEARN. The standing committees of the Board include: Finance, Governance and Participation, and Services and Operations. Additionally, an Audit Committee consisting of three Board members and an independent advisor monitors the activities of the annual independent audit. The Board also creates ad hoc committees of the Board, as necessary.

Within the authority delegated by the Board, the Executive Committee develops the Board agendas and conducts the affairs of LEARN, between meetings of the Board. The Executive Committee is comprised of the elected officers of the corporation and the chairs of the three standing committees. The elected officers of LEARN include: the Executive Director, Chair, Chair Elect, Past Chair, Treasurer and Secretary. Other than the Executive Director, the officers are elected from the members of the Board of Directors.

The day-to-day business of LEARN is managed by the Executive Director of the corporation, who is elected by the Board and serves at their pleasure. The Executive Director employees and supervises a professional technical and administrative staff to conduct and manage operations.

The Technical Advisory Group (TAG) is comprised of representatives, with extensive technical expertise, from our member institutions. TAG members are appointed by the LEARN Board member from the institution they represent. The TAG Chair is elected by the TAG members. TAG is an advisory body to the Board, Executive Director and LEARN's Chief Technologist. TAG serves an important role in helping shape LEARN's infrastructure, operations and portfolio of services.



Akbar Kara LEARN Chief Technologist



Willis Marti Chair, Technical Advisory Group (TAG)

Network Infrastructure

In collaboration with the public and private sector, LEARN's network spans over 3,000 miles across Texas. LEARN is built on dense wavelength division multiplexing (DWDM) optical technology. This technology provides the capability to transport multiple high capacity signals over a shared optical fiber by using the different color wavelengths of a laser light. DWDM is a state-of-the-art technology that is very scalable and permits LEARN to leverage the initial investment by adding additional capacity at marginal costs.

LEARN is built on agreements with the private sector that provide the long-term use of optical dark fibers and/or long term leases of optical wavelength capacity. When dark fiber is conveyed via an indefeasible right to use (IRU) agreement, LEARN provides the infrastructure to "light" the fiber and can add additional capacity, as needed. In wavelength capacity agreements, the service provider provides the infrastructure and bandwidth under the terms and conditions of the agreement.



LEARN's infrastructure enables Wayne Pecena from TTVN to provide critical network services.

Membership & Network Services

Each of the member institutions of LEARN pays \$20,000 per year in dues, which funds the general administration of LEARN. Members are entitled to appoint an individual to the Board of Directors and to acquire network

services from LEARN at member rates.

Network services are enabled based on the needs of individual members and collaborations among our members. Unlike the membership dues, network services are funded by the members who consume the services. Network service rates are set at levels to enable and sustain current and future network requirements. Network services include:

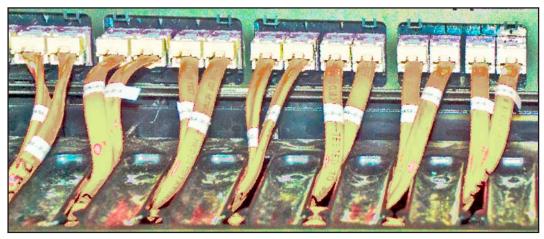
- Layer 1 Transport Services Between LEARN Points of Presence (POP),
- Switched Layer 2 Services,
- Routed Layer 3 Services,
- Thursday
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LEARN enables high definition video connections between the Texas A&M campuses in College Station and Qatar.

- Connection Gateways to the National LambdaRail and Internet2 National Research and Education Networks,
- Colocation Services at LEARN Facilities, and
- Commodity Internet Services.

Although LEARN's network is an important strategic asset, LEARN is really focused on developing a community that is a catalyst for Texans to serve, collaborate, innovate, share and leverage resources, and compete throughout the world.



"Network Cable Plug-ins" Photograph courtesy of Maurice Leatherbury

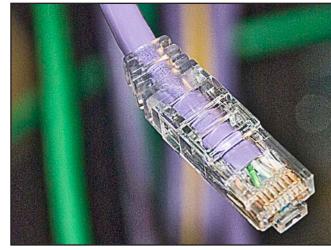
Activities & Accomplishments

During the past year, LEARN has continued to build partnerships to enhance the strategic value of LEARN to Texas. LEARN is a very diverse and talented consortium with a history of success, but a focus on the future.

Highlights from the past year include:

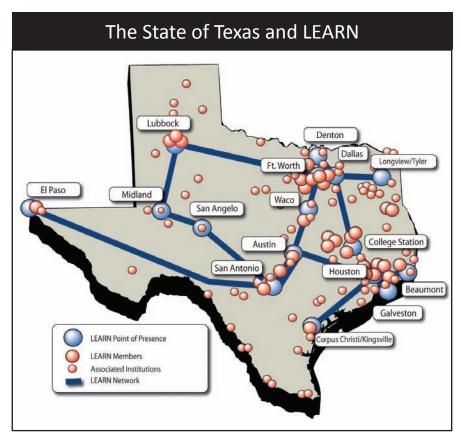
Expanding Access

LEARN's network footprint now covers over 3,000 miles throughout Texas. Expanding access to high performance network enabled services to areas of unmet need is one of our major priorities. During the past year, we completed Phase 2 of the collaboration with the Department of Information Resources (DIR), the Texas Tech University System, and the Texas Lone Star Network (TLSN). TLSN is a private sector telecommunications group comprised of 38 independent telephony companies in Texas. Phase 2 provides a fiber path from San Angelo to San Antonio. This is strategically important, because it creates a protected optical loop throughout much of West Texas that serves the needs of



"Network Cable Connector"
Photograph courtesy of Maurice Leatherbury

our members, TLSN's affiliated telephone companies and their customers, and connects DIR's data centers in Austin and San Angelo. The West Texas loop, which connects to LEARN nodes in Dallas and San Antonio, has points of presence in Lubbock, Midland and San Angelo.



LEARN also completed its Dallas to Tyler and Houston to Beaumont network segments. These two segments are important in meeting the needs of our members in East Texas, and in creating a statewide optical backbone for Texas. LEARN's key private sector partners on these two segments of the network were AT&T and SuddenLink.

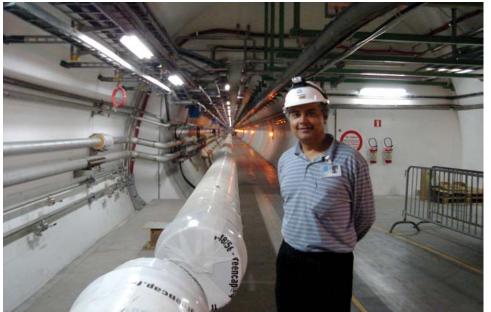
LEARN also connected its network to a network created by a public and private sector partnership that extends optical network services into the Rio Grande Valley of Texas. This partnership between the University of Texas, Texas A&M University and Valley Telephone Cooperative, connects Corpus Christi, Brownsville, Harlingen, Laredo and San Antonio. The Rio Grande Valley network connects to the LEARN network in Corpus Christi and San Antonio.

TIGRE

The Texas Internet Grid for Research and Education (TIGRE) is a collaborative project that brought researchers from a number of institutions together to develop a statewide grid computing infrastructure. The grid comput-

ing initiative provides researchers the capability to transfer large data sets and share computing and storage resources. LEARN has been an integral part of the success of the TIGRE project by providing high capacity bandwidth connections for researchers. Ongoing grid computing projects include energy exploration, atmospheric modeling, biosciences and medical, high energy physics and the large hadron collider.

"I can solve problems that were inaccessible before." Professor Demeler, Biochemist



UT Arlington Physics Professor Kaushik De manages computing operations at all of the Large Hadron Collider Tier 1 and Tier 2 facilities.

Large Hadron Collider

Physicists working on the CERN Large Hadron Collider (LHC) project are seeking answers to the most fundamental questions concerning the properties of matter and energy. The University of Texas at Arlington, University of Texas at Dallas, Southern Methodist University, Rice University and Texas Tech University are actively involved in this global project.

Researchers collaborating on the LHC project must have access to interconnected high capacity networks. LEARN provides the connections and capacity for our

researchers in Texas, and provides them the pathway to the national and international research and education networks their colleagues in the LHC project are connected to. Without LEARN, our researchers would not be able to participate in "big science" collaborations like LHC or bring important research grant funding to Texas.

Texas Digital Library

The Texas Digital Library (TDL) is a consortium of eighteen universities that provides the digital infrastructure to support an online scholarly community in Texas. The TDL collaboration enables the enormous intellectual capital of these universities to be broadly shared throughout the consortium. The eighteen universities in TDL are also members of LEARN. TDL and LEARN have worked closely together to provide cost effective communications technology solutions to the challenges of digital storage, preservation, and connectivity faced by Texas colleges and universities.



Students at Baylor University access the Texas Digital Library through the LEARN network.

LEARN members have developed and deployed an Identity Management Federation using Shibboleth identity attribute sharing technologies to manage access to shared TDL and other online resources. The Identity Management Federation is secure, scalable and enhances collaboration among our institutions.

<u>Disaster Recovery</u>

Hurricane Ike was one of the most devastating storms to ever strike Texas. LEARN's network played a significant role as Texans responded to this disaster. LEARN's member campuses at Texas A&M University at Galveston and the University of Texas Medical Branch at Galveston (UTMB) were hit hard by the fury of Ike. The Texas A&M campus in Galveston was closed for the rest of the semester. However, the LEARN backbone remained up during and after Ike hit Texas. LEARN's network enabled the students, faculty and staff of Texas A&M University at Galveston to remain connected and continue classes via distance education video conferencing. Also, during the disaster recovery period, UTMB was able to maintain the availability of its major information systems



Hurricane Ike approaching Texas.

by using the LEARN network to connect to the University of Texas regional data center in Arlington, which is shared by the University of Texas System member institutions.

Disaster recovery and business continuity planning is an essential element of our member institutions ability to mitigate the impact of future emergency situations. LEARN's network is an important part of the ongoing disaster recovery preparedness of the University of Houston and other member institutions by enabling them high bandwidth access to key public and private sector data storage and recovery sites.

<u>GENI</u>

The Global Environment for Network Innovations (GENI) is a National Science Foundation initiative to support experimental research in networking and distributed systems that will be the foundation for future generations of scalable global interconnected networks. Dr. Deniz Gurkan, a researcher at the University of Houston's College of Technology is actively involved in the GENI project. LEARN helped Dr. Gurkan create a research relationship with Infinera Corporation to provide loaner optical systems for use in Dr. Gurkan's lab. Creating these types of public and private sector research collaborations and enabling access to LEARN's optical networks are essential to Dr. Gurkan's research in data plane measurement.



Baylor nursing students use the LEARN network to attend classes and provide healthcare.

Connecting Through Videoconferencing

The high capacity LEARN network enables our members to use high definition video conferencing to extend the reach of their services, collaborate, share resources and save money.

At Baylor University, access to the FastBacc nursing program provides a 12 month accelerated RN certification program designed for students desiring a career change after they had completed a Bachelor's Degree in a non-nursing discipline.



Texas A&M students in Qatar enjoy the Aggie student experience thanks to LEARN.

Baylor also uses high definition distance education video conferencing to support classes in its Honors College and School of Business, and to host guest lecturers and special events.

College sports are important to our member institutions. Athletic programs are an integral part of students' college experience. They also keep our institutions connected to their alumni and supporters. The LEARN network is used by our members Athletic Directors, administrators and coaches to hold meetings in the Big XII and other conferences, share tapes of games to aid in scouting, and broadcast live athletic events.

To protect our freedom, the armed forces of the United States are deployed throughout the world. In May of this year, Texas A&M University used the LEARN network to connect its College Station campus with the 25th Infantry Division Multinational Division at Camp Speicher in Irag. This high quality two-way interactive videoconferencing enabled a U.S. Army Lieutenant Colonel stationed in Iraq to administer the ROTC new officer commissioning oath to his son and other young men upon their graduation from Texas A&M University.



 $\it ROTC$ graduate in College Station receives the commissioning oath from an officer in Iraq.

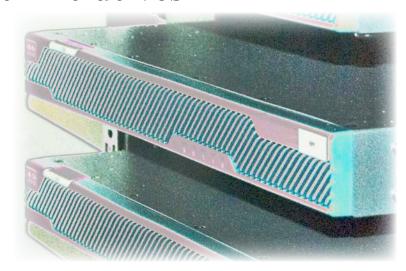
Supercomputing 2008 (SC08) Conference



Almost 10,000 of the world's leading high performance computing and network experts attended the SC08 conference in Austin. In its 20th year, the Supercomputing Conference is the world's premier assembly of next generation networking and computing professionals and technology infrastructure. The University of Texas at Austin provided the local connectivity and LEARN used its high capacity network to connect the conference with the rest of the world. LEARN enabled dynamic circuit capability and 100 and 40 gigabit transport services that were critical to the success of SC08. This prestigious gathering brought world-wide recognition and substantial economic activity to Texas.

Current Initiatives

Although LEARN is a robust and mature organization, the Board of Directors understands the future vitality and value of our organization is not secured by our previous accomplishments and successes. Global collaboration, innovation, scientific discovery, and technological advances provide an unparalleled opportunity to meet the challenges and demands of today and tomorrow. This dynamic environment requires that LEARN continue to be a nimble and responsive organization that is focused on the future.



"Network Switches"
Photograph courtesy of Maurice Leatherbury

Expanding Access

LEARN is currently deploying an optical segment

between Dallas and Denton. Scheduled to be completed in October, LEARN is establishing a network POP with DWDM infrastructure on the campus of the University of North Texas.

LEARN, the University of Texas System, and the University of Houston System are collaborating on a project to deploy a fiber-based network segment between Galveston and Houston. The segment will include connectivity at the University of Texas Medical Branch in Galveston, Texas A&M University at Galveston, the University of Houston, and the medical center in Houston. The project will also include a metropolitan segment in Houston to connect this project with LEARN's network at the Hardy Street POP in Houston.

The American Recovery and Reinvestment Act provides \$7.2 billion in funding to enhance the availability of broadband services throughout the United States. These federal funds are being administered by the National Telecommunications and Information Administration in the Department of Commerce and the Rural Utilities Service in the Department of Agriculture. LEARN has established a working group to develop a Department of Commerce grant application to extend access to LEARN's network to communities that are unserved and

to create optical loops to protect network segments that are currently network spurs. LEARN's grant proposal will focus on connecting key community anchor institutions with the LEARN backbone.

UTMB provides critical healthcare services to over 200 locations throughout Texas. UTMB has initiated a new network design to support access to their healthcare services. The new design will utilize LEARN as the middle mile carrier of the UTMB's statewide network and will provide a distributed network topology providing high performance, fewer potential points of failure, high capacity bandwidth, and lower costs.



UTMB uses the LEARN network to provide healthcare to Texans.



Internet2

Internet2 is an advanced networking, non-profit consortium comprised of more than 200 universities in the United States, 70 leading corporations, 45 governmental agencies and laboratories, and over 50 international partner organizations. The fall member meeting for Internet2 will be held in San Antonio. LEARN and the University of Texas will provide the network support and serve as the co-hosts for this prestigious gathering of people from around the world. Hosting this conference is an honor and it will bring worldwide recognition and substantial economic activity to Texas.

<u>LEARN - NTG Merger</u>

The North Texas GigaPoP (NTG) is a consortium of institutions in the Dallas – Ft. Worth metroplex that share high speed network resources. Currently, the members of NTG include the University of North Texas, University of Texas at Arlington, University of Texas at Dallas, Texas Christian University, Southern Methodist University, the National Weather Service, and the University of Texas Southwestern Medical Center at Dallas.

LEARN and NTG share similar missions, mutual interests, common objectives and member institutions. Both LEARN and NTG believe merging the two organizations will enhance collaboration, create operational efficiencies, and save money. Therefore, the parties have agreed to merge NTG into LEARN. The merger agreement has been finalized and we anticipate receiving the final signature in the next 30 days.

CALEA

The Communications Assistance to Law Enforcement Act (CALEA) requires processes/systems be in place to assist law enforcement in implementing electronic surveillance authorized by a warrant. CALEA applies to public networks managed by service providers and common carriers and certain private enterprise networks. Private networks of universities or regional optical networks (LEARN) that operate their own transport network that connects to an Internet service provider must be able to monitor network traffic at the point it connects to the public network.

LEARN has entered into a partnership with Texas A&M University, the University of Texas System, the Department of Information Resources, and Baylor University to jointly implement and manage a system to meet the CALEA requirements. By collaborating on this project, the parties will implement a solution for less money, develop a common knowledge base that will be shared among the organizations, and share infrastructure that can be deployed, as required.

Cleaning Up the Cold War

The United States and Russia agreed this summer to cut their strategic nuclear arsenals by at least 25 percent. Researchers led by the University of Texas at Arlington (UTA) physics professor Dr. Asok Ray are working to determine how to safely dispose of highly radioactive uranium and plutonium in the decommissioned nuclear weapons.



"Network Cabling"
Photograph courtesy of Maurice Leatherbury

Professor Ray and his colleagues are using the LEARN network to connect the Lonestar supercomputer at the Texas Advanced Computing Center (TACC) at the University of Texas at Austin, the National Energy Research Scientific Computing Center (NERSC) in Berkeley, and UTA's Supercomputing Center in Arlington. LEARN's high capacity network enables Dr. Ray and his team to harness the parallel processing power of the TACC, NERSC, and UTA supercomputers to run simulations, which require several hundred thousand computing hours, to determine how radioactive elements react when exposed to common elements like oxygen, hydrogen, water, and carbon dioxide. Understanding how radioactive elements react to other elements is essential to safely disposing of this radioactive material.

Enhancing LEARN's Services

Recently LEARN upgraded its connection with Internet2 from 1 gigabit to 10 gigabits per second. This upgrade was necessary to meet the bandwidth demands of our members and access dynamic circuit provisioning and commodity peering services through our relationship with Internet2. LEARN's member institutions save a substantial amount of resources each year by aggregating their needs through the LEARN connection with Internet2.

LEARN has begun a project to expand the routed IP-based (Layer 3) services that are available to our members. The initial focus is on upgrading the Layer 3 aggregation service to 10 gigabits that is shared by our members to access LEARN's connection to Internet2. Upgrading the aggregation service is important to maximize the benefits of the Internet2 connection and to provide a protected path for our members to access in the event there is an outage on the primary path. Additionally, we have defined a technology architecture and a set of service principles to offer the following Layer 3 services:

- Create a Texas Education intranet that supports the exchange of traffic among LEARN members,
- CALEA compliant commodity Internet services,
- Research and education peering with the National LambdaRail and Internet2 national research and education networks, and
- Redundant peering points on LEARN's network for our members.



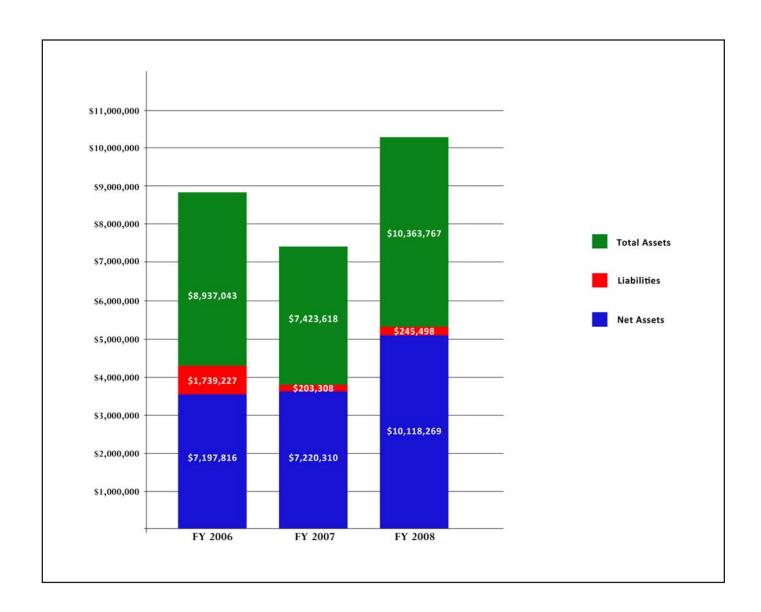
"Array of Network Switches" Photograph courtesy of Maurice Leatherbury

To support our commodity Internet service offering, LEARN has applied for a Service Provider Identification Number (SPIN) with the Universal Service Administration Company. Acquiring a SPIN number will permit our school, library, and rural health customers to receive significant discounts, they are eligible to receive through the Universal Services Fund.

The Board and the staff are committed to ensuring LEARN remains a customer focused organization. Enhancing our portfolio of services is a cornerstone of the strategic priorities, which are guiding our current initiatives. There is a broad consensus among our members that continuing to expand the scope of services, which are available from LEARN, creates operational efficiencies, provides additional options for customers, supports collaboration, and enhances the overall value of LEARN.

Total Assets, Liabilities, & Net Assets

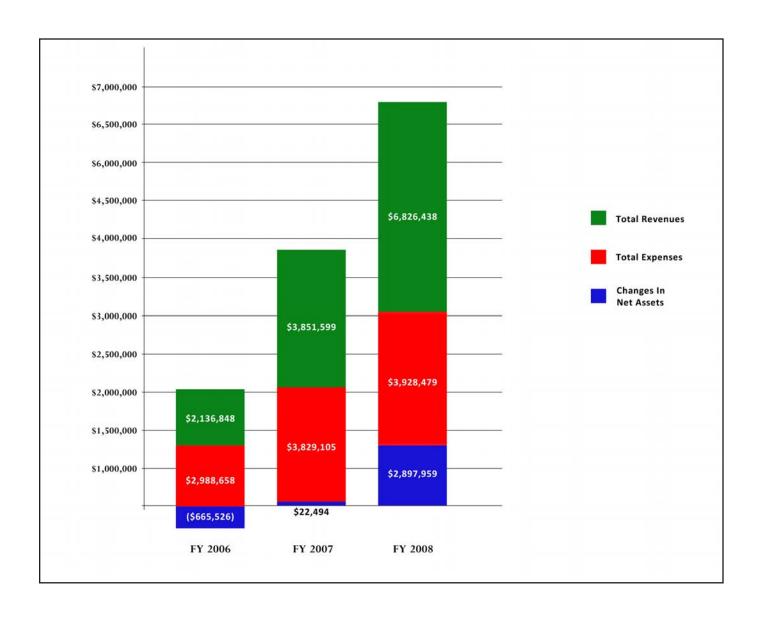
	FY 2006	FY 2007	FY 2008
Total Assets	\$ 8,937,043	\$ 7,423,618	\$ 10,363,767
Liabilities	\$ 1,739,227	\$ 203,308	\$ 245,498
Net Assets	\$ 7,197,816	\$ 7,220,310	\$ 10,118,269



^{*} The audit of 2008 has not been completed as of the publication date.

Total Revenues, Total Expenses, & Changes in Net Assets

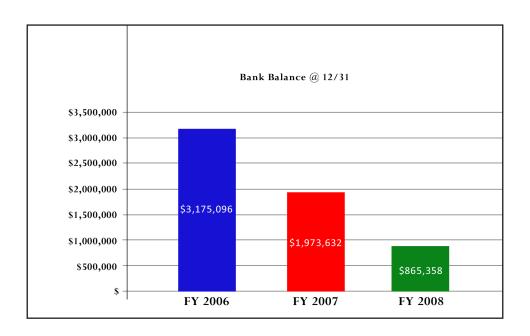
	FY 2006	FY 2007	FY 2008
Total Revenues	\$ 2,136,848	\$ 3,851,599	\$ 6,826,438
Total Expenses	\$ 2,988,658	\$ 3,829,105	\$ 3,928,479
Changes In Net Assets	(\$ 665,526)	\$ 22,494	\$ 2,897,959



^{*} The audit of 2008 has not been completed as of the publication date.

TEF End of Year Bank Balance

	FY 2006	FY 2007	FY 2008
Bank Balance @ 12/31	\$ 3,175,096	\$ 1,973,632	\$ 865,358



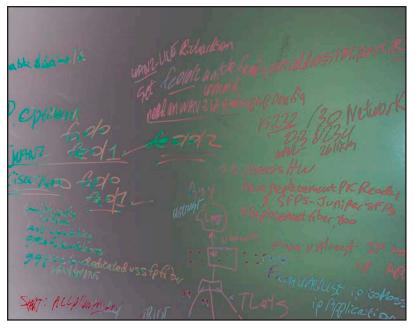
TEF Investments by Area

	Expenses & Encumbrances 12/31/2008	Expected Investment
Triangle*	\$ 4,415,634	\$ 4,415,634
West Texas	\$ 705,561	\$ 705,561
El Paso	\$ 116,110	\$ 116,110
Tyler	\$ 275,891	\$ 329,239
Beaumont	\$ 156,469	\$ 330,175
Corpus Christi	\$ 491,919	\$ 491,918
Denton	\$ 40,000	\$ 180,000
Galveston	\$ 0	\$ 375,000
Transition	\$ 578,976	\$ 578,976
TOTAL	\$ 6,780,560	\$ 7,522,613

^{*} The Triangle connects the cities of Houston, College Station, San Antonio, Austin, Waco, and Dallas.

Infrastructure Performance

LEARN has deployed and operates a sophisticated state-of-the-art fiber-based optical network throughout Texas. The infrastructure is "carrier grade" optical technology that is highly reliable and capable of provisioning high-speed bandwidth between Texas cities. While capacity is important, the reliability of the network is just as important. In today's complex and interconnected world, an "always on" reliable network is the foundation of our members' needs and their expectations. A network outage can cause significant disruptions for our members.



"Network DesignWhiteboard"
Photograph courtesy of Maurice Leatherbury

The topology of the vast majority of LEARN's network is designed to provide optical rings, which serve as a protected path for our customers in the event of a failure in the network infrastructure. This design redundancy is a key element of the network's performance from a customer impact perspective.

The LEARN Network Operations Center (NOC) is staffed by professional network engineers 24 hours a day, 7 days a week, and 365 days a year. The NOC serves as the central point for monitoring and managing the overall health and performance of the network. LEARN engineers have the network management tools and the training they need to manage the configuration of the network, monitor the performance of the network segments and their components, diagnose and isolate the

cause of performance issues, and manage incidents until they are resolved. LEARN staff works closely with our members to align our network management practices and performance with their needs.

Despite the network design, the reliability of deployed infrastructure, operational discipline, and the expertise of our network engineers, occasionally components of the network fail. In order to reduce the time

required to replace these components, LEARN has acquired and strategically deployed critical infrastructure spares throughout the network. Additionally, LEARN maintains maintenance and support agreements for its critical infrastructure.

During the past year, LEARN's network was very reliable. Our Layer 2 FrameNet services were available without disruption. For our Layer 1 WaveNet services, the network was available 99.99% of the time. While these performance levels are very good, LEARN is always exploring strategies to improve the availability of the network and customer satisfaction.



Network engineers manage LEARN's network.

Appendices

I.	LEARN	Board	of	Directors

1. EE/IIII Boo	ira of Birectors
Jenifer Jarriel Vice President, Information Technology & CIO Baylor College of Medicine	Sam Segran Chief Information Officer Texas Tech University
Pattie Orr Vice President, Information Technology & Dean of University Libraries Baylor University	Kay Rhodes Chief Information Officer Texas Tech University System
Michael E. Dobe, Sr. Associate Vice President & CIO Lamar University	Bill Palmertree Vice President, Technology & Information Services & CIO Texas Woman's University
Mickey Slimp Executive Director Northeast Texas Consortium of Colleges & Universities (NETnet)	Dennis Fouty Associate Vice Chancellor, Information Technology & CIO University of Houston System
Luis-Pablo Grijalva Chief Information Officer Prairie View A&M University	Maurice Leatherbury Acting Vice President for Information Technology & CIO University of North Texas System
Kamran M. Khan Vice Provost, Information Technology Rice University	Bob Lim Vice President, Information Technology University of Texas - Pan American
Mark C. Adams Associate Vice President, Information Resources Sam Houston State University	Suzanne Montague Vice President, Information Technology & CIO University of Texas at Arlington
Joseph (Joe) Gargiulo Chief Information Officer Southern Methodist University	William Green Director of Networking, Information Technology Services University of Texas at Austin
Paul T. Davis Director, Information Technology Services Stephen F. Austin State University	Jim Gary Vice President, Information Resources & CIO University of Texas at Dallas
David A. Cantrell Vice President, Information Technology & CIO Texas A&M Health Science Center	Stephen Riter Vice President, Information Resources & Planning University of Texas at El Paso
Pierce E. Cantrell Vice President & Associate Provost for Information Technology & CIO Texas A&M University	Kenneth (Ken) Pierce Vice Provost, Information Technology University of Texas at San Antonio
Claudia McDonald Associate Vice President for Special Projects Texas A&M University Corpus Christi	William (Bill) A. Weems Assistant Vice President, Academic Technology University of Texas Health Science Center at Houston
Rodney (Rod) L. Zent Executive Director, Educational Broadcast Services TTVN Texas A&M University System	A. Jerome (Jerry) York Vice President, Academic Technology Services & CIO University of Texas Health Science Center at San Antonio
William (Bill) E. Carter Vice Chancellor, Information Technology Texas Association of Community Colleges	John D. Yoder, Jr. Chief Information Officer University of Texas Health Science Center at Tyler
Bryan Lucas Executive Director, Technology Resources Texas Christian University	Keith Perry Associate Vice President & Deputy CIO University of Texas MD Anderson Cancer Center
Steve Hyden Executive Director, Education Service Center - Region 5 Texas Education Telecommunications Network (TETN)	Ralph Farr Vice President, Information Services University of Texas Medical Branch
C. Van Wyatt Vice President, Information Technology Texas State University San Marcos	Kirk Kirksey Vice President, Information Resources University of Texas Southwestern Medical Center of Dallas
.	(A A = v =) V = = v :

Margaret (Marg) Knox Associate Vice Chancellor & CIO University of Texas System

II. LEARN 2008 Year End Financial Statements

LONESTAR EDUCATION AND RESEARCH NETWORK Financial Statements Year Ended December 31, 2008



512.795.8080 V 512.795.9183 F 4901 Spicewood Springs Road, Suite 100 Austin, Texas 78759 www.roberson.com Members of
American Institute of
Certified Public Accountants

Members of Texas Society of Certified Public Accountants

To the Board of Directors Lonestar Education and Research Network Austin, Texas

We have compiled the accompanying Statement of Financial Position of Lonestar Education and Research Network (a nonprofit organization) as of December 31, 2008, and the related Statement of Activities for the year then ended, in accordance with Statements on Standards for Accounting and Review Services issued by the American Institute of Certified Public Accountants.

A compilation is limited to presenting in the form of financial statements information that is the representation of management. We have not audited or reviewed the accompanying financial statements and, accordingly, do not express an opinion or any other form of assurance on them.

Statement of cash flow for the year ended December 31, 2008, has not been presented. Generally accepted accounting principles require that such a statement be presented when financial statements purport to present financial position and results of operations. This is a departure from generally accepted accounting principles.

Management has elected to omit substantially all of the disclosures ordinarily included in financial statements. If the omitted disclosures were included in the financial statements, they might influence the user's conclusions about the Organization's assets, liabilities, net assets, revenues, and expenses. Accordingly, these financial statements are not designed for those who are not informed about such matters.

February 27, 2009

LONESTAR EDUCATION AND RESEARCH NETWORK STATEMENT OF FINANCIAL POSITION DECEMBER 31, 2008

ASSETS

TOTAL LIABILITIES AND NET ASSETS	Total Net Assets	NET ASSETS Unrestricted net assets Temporarily restricted net assets	Total Current Liabilities/Total Liabilities	CURRENT LIABILITIES Accounts payable \$ Deferred revenue		TOTAL ASSETS S	Total Other Assets	OTHER ASSETS Network and IRU access rights Less accumulated amortization	Property and Equipment - net	Less accumulated depreciation	PROPERTY AND EQUIPMENT Network equipment Furniture and equipment	Total Current Assets	Network services Refundable expenses Funds held by others	CORKEN I ASSETS Cash and cash equivalents Accounts assimble.	11 1
1,135,231	1,055,025	1,055,025	80,206	80,206	LIABIL	1,135,231			13,200	34,381 (21,181)	- 34,381	1,122,031	4,113	1,117,918	Program Fund
\$ 8,360,579	8,195,287	7,795,287 400,000	165,292	\$ 165,292	LIABILITIES AND NET ASSETS	\$ 8,360,579	4,828,827	5,135,306 (306,479)	2,404,761	3,893,222 (1,488,461)	3,893,222	1,126,991	233,192 39,897 -	\$ 853,902	Unrestricted Network Fund
\$ 2,599	2,599	2,599	ŀ	.	「ASSETS	\$ 2,599	ı	1 1		1 1	1 1	2,599		\$ 2,599	Current Operating Funds cted k Fund NLR Fund
€				₩		~								∽	Texas
865,358	865,358	865,358	1	1 4		865,358	1	1 1		, ,	1 1	865,358		865,358	Temporarily Restricted Texas Enterprise Fund
\$ 10,363,767	10,118,269	8,852,911 1,265,358	245,498	\$ 245,498		\$ 10,363,767	4,828,827	5,135,306 (306,479)	2,417,961	3,927,603 (1,509,642)	3,893,222 34,381	3,116,979	233,192 39,897 4,113	\$ 2,839,777	Total

See accountant's compilation report.

LONESTAR EDUCATION AND RESEARCH NETWORK STATEMENT OF ACTIVITIES FOR THE YEAR ENDED DECEMBER 31, 2008

REVENUES AND OTHER SUPPORT Membership dues Assessments Other revenues Investment income NET ASSETS RELEASED FROM RESTRICTIONS: Satisfaction of program restrictions TOTAL REVENUES AND OTHER SUPPORT EXPENSES PROGRAM SERVICES Membership dues Connections and fibers Installation Operating lease Network parts and supplies Amortization Depreciation Total Program Expenses SUPPORTING SERVICES SUPPORTING SERVICES	Program Fund \$ 680,000 - 27,087 - 707,087	Curre Unrestricted Network Fund 8 5,074,593 8,798 1,141,673 6,225,064 6,225,064 23,832 39,152 44,533 156,109 714,249 8 2,125,312	Current Operating Funds cted NLR Fund NLR Fund 1,000,001 7,798 2,560 1,002,561 1,002,561 1,152 1,100,001	S Texas	Temporarily Restricted Texas Enterprise Fund \$	
PPORTING SERVICES Professional fees: Administration	\$ 288,461	\$ 280,410	·	\$	•	
Accounting Legal Other Insurance	26,376 28,414 4,029 20,499					
Travel Sponsored meetings Telephone	33,548 24,799 10,316	51,476 - -	() ()			
Marketing Membership dues Office expenses Computer and software supplies Bank service charges Depreciation	3,225 4,990 8,271 10,506 (334) 7,109	- 272 799				
Total Supporting Services	\$ 470,209	\$ 332,957	5	55	ı	∞اا
TOTAL EXPENSES CHANGES IN NET ASSETS	470,209 236,878	2,458,269 3,766,795	1,000,001 2,560		(1,108,274)	1
NET ASSETS: Beginning balance at January 1, 2008	818,147	4,428,492	39		1,973,632	1
Ending balance at December 31, 2008	\$ 1,055,025	\$ 8,195,287	\$ 2,599	S	865,358	↔

See accountant's compilation report.

LONESTAR EDUCATION AND RESEARCH NETWORK

SUPPLEMENTARY INFORMATION



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Members of Texas Society of Certified Public Accountants

To the Board of Directors Lonestar Education and Research Network Austin, Texas

Our report on our compilation of the Statement of Financial Position of Lonestar Education and Research Network (a nonprofit organization) as of December 31, 2008 and the related Statement of Activities for the year then ended appears on page 1.

A compilation is limited to presenting in the form of financial statements information that is the representation of the management. We have not audited or reviewed the accompanying financial statements and, accordingly, do not express an opinion or any other form of assurance on them.

The information included in the accompanying Schedule I is presented only for supplementary analysis purposes. Such information has been compiled from information that is the representation of the management, without audit or review. Accordingly, we do not express an opinion or any other form of assurance on the supplementary information.

LONESTAR EDUCATION AND RESEARCH NETWORK

SCHEDULE I

TEXAS ENTERPRISE FUND RECONCILIATION FROM INCEPTION THROUGH THE PERIOD ENDED DECEMBER 31, 2008

FUNDS RECEIVED:		
State Grant	\$	7,281,000
Interest income	Ψ	249,010
Initial bank deposit		249,010
TOTAL FUNDS RECEIVED		7,530,210
		7,330,210
FUNDS DISBURSED:		
Purchases of capital equipment		3,464,998
Purchases of IRU access rights		2,175,482
Connections and fiber		332,671
Installation		288,699
Site evaluation		95,513
Field services		96,498
Network Parts		102,008
Collocation		84,079
Freight		24,778
Bank fees		126
TOTAL FUNDS DISBURSED	_	6,664,852
		0,004,002
BANK BALANCE AT DECEMBER 31, 2008	\$	865,358

III. Affiliated Organizations

Alvin Community College

Angelina College

Austin Community College

Blinn College

Brazosport College Del Mar College

Galveston College

Hill College

Howard College Kilgore College

Lamar State College Orange Lamar State College Port Arthur

Lee College Navarro College

Northeast Texas Community College

Panola College Paris Junior College Texarkana College

Texas Southmost College Texas State Technical College Trinity Valley Community College

Tyler Junior College Victoria College

Wharton County Junior College Lamar Institute of Technology Southwestern Adventist University

Tarleton State University

Texas A&M International University Texas A&M University at Galveston Texas A&M University Commerce Texas A&M University Kingsville Texas A&M University Texarkana University of Texas at Brownsville

University of Texas at Tyler

The University of Texas Permian Basin

University of Houston

University of Houston Clear Lake University of Houston Downtown University of Houston Victoria University of Incarnate Word

University of North Texas Health Science Center

West Texas A&M University

Alamo Area Council Of Governments Bexar County Information Services

Cameron County City of Austin City of Plano

Department of Information Resources

Duncanville Public Library Ector County Library Fort Worth Public Library

Galveston County IT Department

Guadalupe Valley Hospital

Hidalgo County Planned Parenthood

Hondo Public Library Lampasas Public Library

Lower Colorado River Authority McKinney Memorial Public Library Medina Community Hospital

Melissa Public Library Mesquite Public Library

Mission Hospital

Moore Memorial Public Library

National Archives & Records Administration

National Weather Service New Braunfels Public Library Nicholson Memorial Library

Orange County

Parkland Memorial Hospital Rio Grande Digital Dental Clinic

Sabine River Authority

Southwest Education Development Lab

Texas AgriLife Research Station

Texas AgriLife Extension

Texas Engineering Experiment Station Texas Engineering Extension Service

Texas Forest Service

Texas Transportation Institute

Texas Veterinary Medical Diagnostic Lab

Travis County

Uvalde Memorial Hospital Valley International Airport Victoria Public Library Wharton County Library Zale Lipshy Hospital

Education Service Center - Region 3
Education Service Center - Region 4
Education Service Center - Region 5
Education Service Center - Region 6
Education Service Center - Region 11
Education Service Center - Region 13
Education Service Center - Region 16
Education Service Center - Region 20

Adrian ISD Alief ISD Alvord ISD Anahuac ISD

Anderson-Shiro CISD

Angleton ISD

Annunciation Orthodox School

Apple Springs ISD

Austin ISD

Austwell-Tivoli ISD

Bartlett ISD Bastrop ISD Bay City ISD Big Sandy ISD

Big Springs Charter School

Birdville ISD
Blanco ISD
Bloomington ISD
Bluff Dale ISD
Boling ISD
Booker ISD
Borger ISD
Bovina ISD
Boyd ISD
Boys Ranch ISD

Brackett ISD

Brazos ISD

Brazos School for Inquiry & Creativity

Brenham ISD Bridgeport ISD Brock ISD Brookeland ISD Bryan ISD Buckholts ISD Buna ISD Burkeville ISD Burton ISD

Calhoun County ISD

Caldwell ISD

Canadian ISD
Canyon ISD
Castleberry ISD
Center Point ISD
Centerville ISD
Central Heights ISD
Channelview ISD
Channing ISD
Charlotte ISD
Chester ISD

Coldspring-Oakhurst CISD

College Station ISD Colmesneil ISD Columbus ISD Comfort ISD Community ISD

Chico ISD

Childress ISD

Claude ISD

Clarendon ISD

Corrigan-Camden ISD

Cotulla ISD
Coupland ISD
Crockett ISD
Cuero ISD
Dalhart ISD
Damon ISD
Danbury ISD
Darrouzett ISD
Decatur ISD
Del Valle ISD

Del Valle ISD Denton ISD Deweyville ISD D'Hanis ISD Dime Box ISD

Divide ISD

Doss Consolidated CSD Dripping Springs ISD

Dublin ISD
Dumas ISD
Duncanville ISD
Eagle Pass ISD
East Bernard ISD
East Central ISD
East Chambers ISD
Eden Park Academy

Edna ISD

Education Center

Elgin ISD Era ISD

Erath Excels Academy, Inc.

Evadale ISD
Excel Academy
Ezzell ISD
Fayetteville ISD
Flatonia ISD
Florence ISD
Floresville ISD
Follett ISD
Fort Elliott CISD
Fort Worth ISD
Franklin ISD

Fredericksburg ISD Ft. Sam Houston ISD Galena Park ISD Garner ISD Gause ISD

Girls & Boys Prep Academy

Glen Rose ISD Godley ISD Goliad ISD

Giddings ISD

Gonzales ISD Goodrich ISD Gordon ISD Graford ISD

Grandview-Hopkins ISD

Granger ISD
Grapeland ISD
Groom ISD
Groveton ISD
Gruver ISD
Halletsville ISD
Happy ISD
Hardin ISD
Harlingen CISD
Harper ISD
Hart ISD

Hartley ISD

Hearne ISD

Hedley ISD Hempstead ISD Higgins ISD High Island ISD Highland Park ISD

Hull-Daisetta ISD

Hunt ISD Hutto ISD Industrial ISD Ingram ISD Iola ISD Jarrell ISD

John Cooper School Johnson City ISD

Joshua ISD
Joshua ISD
Jourdanton ISD
Karnes City ISD
Kelton ISD
Kendleton ISD
Kenedy ISD
Kennard ISD
Kennard ISD
Kennedale ISD
Kinkaid School

Kirbyville CISD Klein ISD Knippa ISD Kountze ISD Kress ISD La Grange ISD Lackland ISD Lago Vista ISD Lake Travis ISD

Lake Worth ISD Latexo ISD Lefors ISD
Leggett ISD
Leon ISD
Lexington ISD
Liberty Hill ISD

Liberty Hill ISD Lindsay ISD Lingleville ISD Lipan ISD

Little Cypress-Mauriceville CISD

Little Elm ISD
Livingston ISD
Lockhart ISD
Louise ISD
Lovelady ISD
Luling ISD
Lumberton ISD
Madisonville CISD
Magnolia ISD
Marion ISD
Matagorda ISD
McDade ISD
McLean ISD
Medina ISD

Medina Valley ISD Memphis ISD Meyersville ISD Miami ISD Milano ISD Millsap ISD

Mineral Wells ISD

Monsignor Kelly Catholic High School

Moulton ISD
Muenster ISD
Mumford ISD
Natalia ISD
Navarro ISD
Navasota ISD
Nazareth ISD
Nederland ISD
New Braunfels ISD
New Caney ISD

New Frontiers Charter School

New Waverly ISD
Newton ISD
Nixon-Smiley CISD
Nordheim ISD
Normangee ISD
North Zulch ISD
Nursery ISD
Oakwood ISD
Odem Edroy ISD
Onalaska ISD

Orangefield ISD
Palacios ISD
Palo Pinto ISD
Pampa ISD
Panhandle ISD
Paradise ISD
Peaster ISD
Perryton ISD
Pflugerville ISD
Pilot Point ISD

Plemons-Stinnett-Phillips CISD

Ponder ISD
Poolville ISD
Por Vida Academy
Port Aransas ISD
Port Arthur ISD
Poth ISD
Prairie Lea ISD
Pringle-Morse CISD

Randolph Field ISD Raven School Refugio ISD Rice CISD

Richard Milburn Academy

Richards ISD Rio Vista ISD River Road ISD

Round Top-Carmine ISD

Royal ISD Runge ISD Sabinal ISD Sabine Pass ISD Samnorwood ISD

San Antonio Technology Academy

San Marcos CISD Sanford-Fritch ISD

Sanger ISD Santo ISD

Schertz-Cibolo-U City ISD

Schulenburg ISD

Sealy ISD
Seguin ISD
Shamrock ISD
Shepherd ISD
Shiner ISD
Silsbee ISD
Silverton ISD
Sivells Bend ISD
Slidell ISD

Somerville ISD Spearman ISD

Snook ISD

Spring Creek ISD Spurger ISD

St. Francis de Sales School St. Vincent de Paul School

Stockdale ISD

Strake Jesuit College Prepatory

Stratford ISD
Strawn ISD
Sunray ISD
Sweeny ISD
Sweet Home ISD
Tarkington ISD
Taylor ISD
Texas City ISD
Texhoma ISD
Texline ISD
Thorndale ISD
Thrall ISD

Trinity Valley School

Tulia ISD Utopia ISD Uvalde CISD Valley View ISD

Tidehaven ISD

Tolar ISD

Vega ISD
Venus ISD
Victoria ISD
Vidor ISD
Vysehrad ISD
Waelder ISD
Walcott ISD
Waller ISD
Walnut Bend IS

Walnut Bend ISD Warren ISD Weimar ISD Wellington ISD

West Hardin County CISD West Orange-Cove CISD

Westhoff ISD
Wharton ISD
Wheeler ISD
White Deer ISD
Wildorado ISD
Wimberley ISD
Woodsboro ISD
Woodville ISD
Yoakum ISD
Yorktown ISD



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