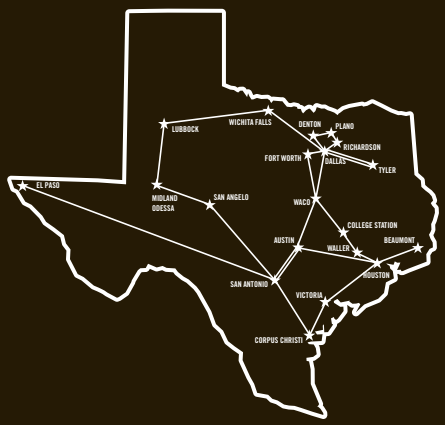
2015 ANNUAL REPORT



LEARN

LONESTAR EDUCATION AND RESEARCH NETWORK

ON THE COVER

Our cover shows an oil spill in the Gulf of Mexico. In our report, you will read how researchers at Texas A&M University and the University of Haifa are able to monitor, in real time, how environmental and other factors impact the water and marine life in similar bodies of water, the Gulf of Mexico and the Levant area of the Mediterranean.

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LEARN
LONESTAR EDUCATION AND RESEARCH NETWORK

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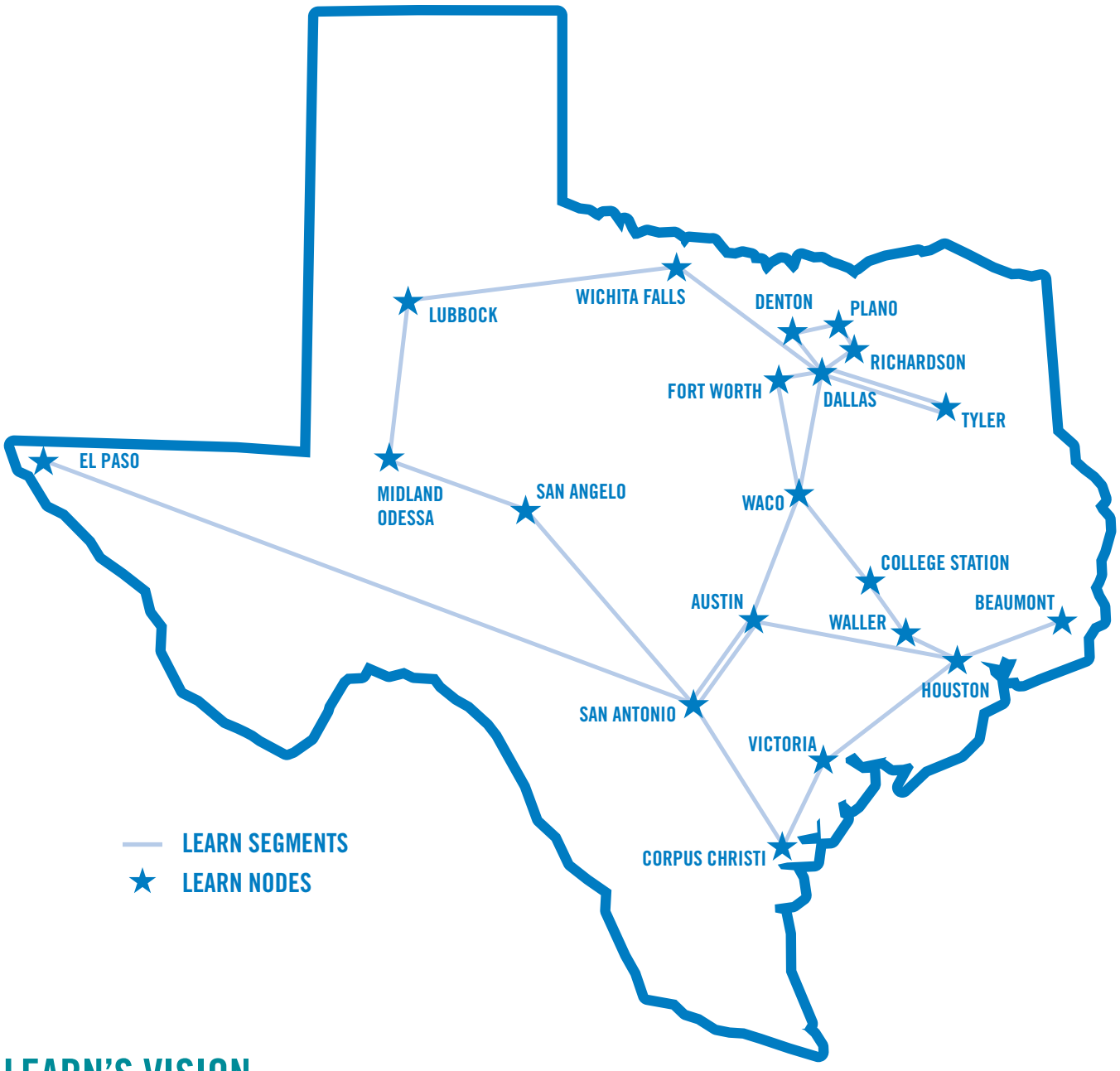
LEARN'S NETWORK TOPOLOGY



LEARN'S VISION

To be the premier organization providing advanced network services for research, education, healthcare 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.

LETTER FROM THE CHAIR

JOE GARGIULO
CIO at Southern Methodist University and Chair of the LEARN Board of Directors

It is my privilege, on behalf of our Board of Directors, to present LEARN's 2015 Annual Report. We are delighted to report that during the year, our large and diverse consortium made significant contributions to our education, research, healthcare and public service missions. In our report, you will have the opportunity to read about the remarkable accomplishments and contributions that our students, faculty, researchers, and healthcare professionals are making as a result of having access to LEARN's advanced research and education network. As you will see in our report, innovative partnerships and collaboration within our community and with the public and private sectors remain the foundation of our work and our success.

The first meeting of LEARN's Board of Directors was held on the campus of Southern Methodist University (SMU). During that meeting, there was great enthusiasm to create a strategically important statewide resource for Texas despite the significant challenges of a large state that is both very urban and very rural. Over the years our consortium met these challenges and we have deployed a valuable network throughout Texas that connects over 800,000 students enrolled in higher education in Texas and over 1,000,000 students in our K–12 public schools. Therefore, during the past year our community returned to the campus of SMU to celebrate, at the George W. Bush Presidential Center, the 10th anniversary of "first light" on our network and our history of success. While it was important that we celebrated this important milestone, it was even more important that our community reaffirmed its commitment and focus on the future, because significant opportunities and work remain.

LEARN plays a critical role in the national and international ecosystem of interconnected advanced research and education networks that are essential to educating our students and in conducting transformational research and scientific discovery. During the year, LEARN's senior staff served in key leadership positions in national organizations important to our mission. Additionally, this past year Texas hosted two important international conferences. These conferences and the service of our senior staff brought recognition and prestige to Texas and they reflect our global leadership role. During the past seven years, we have been blessed to have had Mike Phillips serve as our President and CEO. His dedication to our work and his leadership have been an important part of our success. After Mike announced his plans to retire, the Board of Directors launched a national search for our next President and CEO. The Board was extremely pleased that Pankaj Shah, a proven national leader, agreed to become our next CEO. The Board welcomes Pankaj and his family to Texas and we are excited to have him lead our consortium.

LETTER FROM THE PRESIDENT & CEO

MIKE PHILLIPS
President and CEO of LEARN

Our Annual Report reflects the strategically important leadership role that our dynamic community and our advanced network plays in securing a prosperous future for Texas. The foundation of the vision we have for the future of Texas lays in our ability to educate and develop the next generation of leaders, enable ground breaking research to improve the world we the live in through innovation and scientific discovery, improve the healthcare system we reply on, improve our economic prosperity and maintain and grow our leadership position globally.

There are over 650 organizations participating in our diverse community. Bound together by a collaborative culture based on mutual respect and trust and our service to Texas, the LEARN community includes K–12 independent school districts; K–12 education service centers; universities and colleges; health science centers; community colleges; the National Weather Service; libraries; cities; counties and other important community anchor institutions. While the needs of our community members are very different, through leadership and collaboration we are sharing scarce resources and valuable services to create economies of scale that enable us to achieve remarkable things by leveraging the network and the expertise and capability of one another.

During the year, LEARN played an important role in hosting the first ever joint meeting of the Energy Sciences Network (ESnet), the National Science Foundation (NSF) and The Quilt. This meeting resulted in the development of new strategic relationships and collaborative strategies between the NSF, the principle funding agency focused on advancing the progress of science; ESnet, the Department of Energy's science network; and The Quilt, the national community of advanced regional optical networks like LEARN. The success of the meeting exceeded expectations and it laid the foundation for future joint meetings and collaborations in areas of mutual interest. Additionally, as highlighted in our Annual Report, we also hosted and played a leadership role in the success of SC15, the international supercomputing conference that brought together a record number of over 12,900 attendees from around the globe.

It has been my pleasure to have been involved in LEARN from the time it was just an idea. First as a member of the Board of Directors, then as the President and CEO of LEARN. It has been a remarkable journey for our organization and for me personally. I will be forever grateful to the Board for allowing me to serve as the CEO for the past seven years. Together we have transformed LEARN from a vision into a very successful member governed organization that delivers great value to our members. While we have a rich history of success, I am certain that with the dynamic leadership of our new CEO, Pankaj Shah, and the Board, our best days lay in front of us.

EXECUTIVE COMMITTEE

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JOE GARGIULO
Southern Methodist University

MIKE PHILLIPS
LEARN

Chair Elect:
TERRY TATUM
Texas A&M University – Corpus Christi

Secretary:
JEFFREY GRAHAM
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Past Chair:
STEVE RITER
University of Texas at El Paso

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Texas Tech University System

Chair, Governance & Participation Committee:
PATTIE ORR
Baylor University

Chair, Operations & Services Committee:
WILLIAM GREEN
University of Texas at Austin

MEMBER ORGANIZATIONS

Angelo State University

Baylor College of Medicine

Baylor University

Lamar University

National Weather Service

Northeast Texas Consortium of Colleges & Universities (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

Texas Tech University

Texas Tech University Health Sciences Center

Texas Tech University Health Sciences Center at El Paso

Texas Tech University System

Texas Woman's University

University of Houston System

University of North Texas System

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 Houston

University of Texas Health Science Center at San Antonio

University of Texas Health Science Center at Tyler

University of Texas MD Anderson Cancer Center

University of Texas Medical Branch at Galveston

University of Texas Rio Grande Valley

University of Texas Southwestern Medical Center at Dallas

University of Texas System

OVERVIEW & HISTORY

WHO IS LEARN?

The Lonestar Education And Research Network (LEARN) is a consortium of 39 organizations throughout Texas that includes public and private institutions of higher education, community colleges, the National Weather Service, and K–12 public schools. The consortium, organized as a 501(c)(3), connects these organizations, and over 600 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.

HOW WAS LEARN CREATED?

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.

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.

Optical fiber cable

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 Board of Directors governs 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 Operations and Services. Additionally, an Audit Committee consisting of three elected 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.

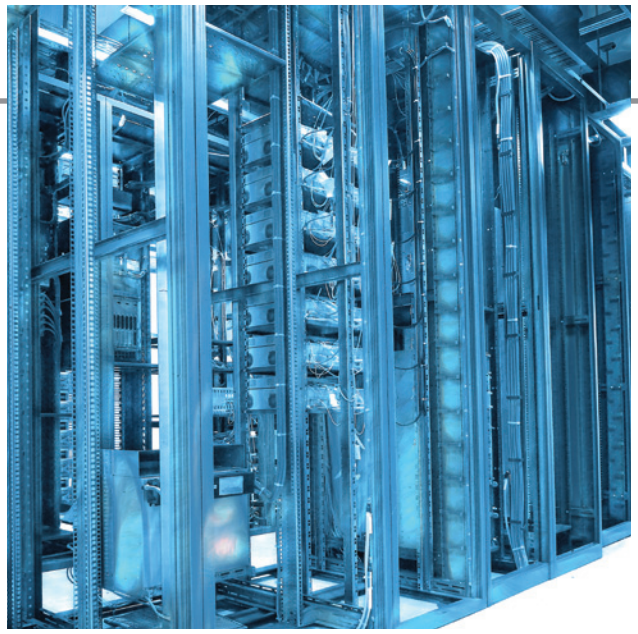
Within the authority delegated by the Board, the Executive Committee develops the Board agendas and governs the affairs of LEARN, between meetings of the Board. The Executive Committee is comprised of the elected officers of the corporation and the Chairs of the three standing committees. The elected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

The day-to-day business of LEARN is managed by the President and CEO of the corporation, who is elected by the Board and serves at their pleasure. The CEO 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, President and LEARN's Chief Technology Officer. TAG serves an important role in helping shape LEARN's infrastructure, operations and portfolio of services.

AKBAR KARA
LEARN, Chief Technology Officer

WAYNE PECENA
TAG Chair



LEARN has over 30 network points-of-presence strategically located throughout Texas.

NETWORK INFRASTRUCTURE

In collaboration with the public and private sector, LEARN's network spans over 3,200 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 laser light. DWDM is 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.

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 MPLS Services,
- Routed Layer 3 Services,
- Connection Gateways to the Internet2 National Research and Education Network,
- Colocation Services at LEARN Facilities,
- Commodity Internet Services, and
- Peering and Caching Services.

LEARN has received a Service Provider Identification Number (SPIN) with the Universal Service Administration Company. Acquiring a SPIN number permits our school, library, and rural health customers to receive significant discounts 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.

ACTIVITIES & ACCOMPLISHMENTS

TEXAS HOSTS THE PREMIER INTERNATIONAL SUPERCOMPUTING CONFERENCE

In November, Texas hosted the world's premier international supercomputing conference in Austin. Celebrating its 25th anniversary, Supercomputing 2015 (SC15) attracted a record breaking attendance of over 12,900 people from 343 organizations from around the world to the weeklong conference and exhibition.

LEARN staff played a leadership role in the success of SC15 by chairing the wide area network (WAN) initiatives team that provided the advanced high speed network required to support the conference attendees and the "big data" global scale research demonstrations. Working with SCinet colleagues from around the world, over the course of the past year, staff designed and deployed an ultrafast global network that included 89 miles of optical fiber in the Austin Convention Center, and $22 million of state-of-the-art equipment loaned by private sector partners that leveraged the capacity of commercial and advanced research and education networks to enable 1.63T per second of bandwidth for the conference and its exhibitions. A critical part of the overall design and performance of the network was LEARN's deployment of six 100G wavelengths on LEARN's network to enable a 200G per second packet ring between LEARN's nodes in Houston, Dallas and Austin.

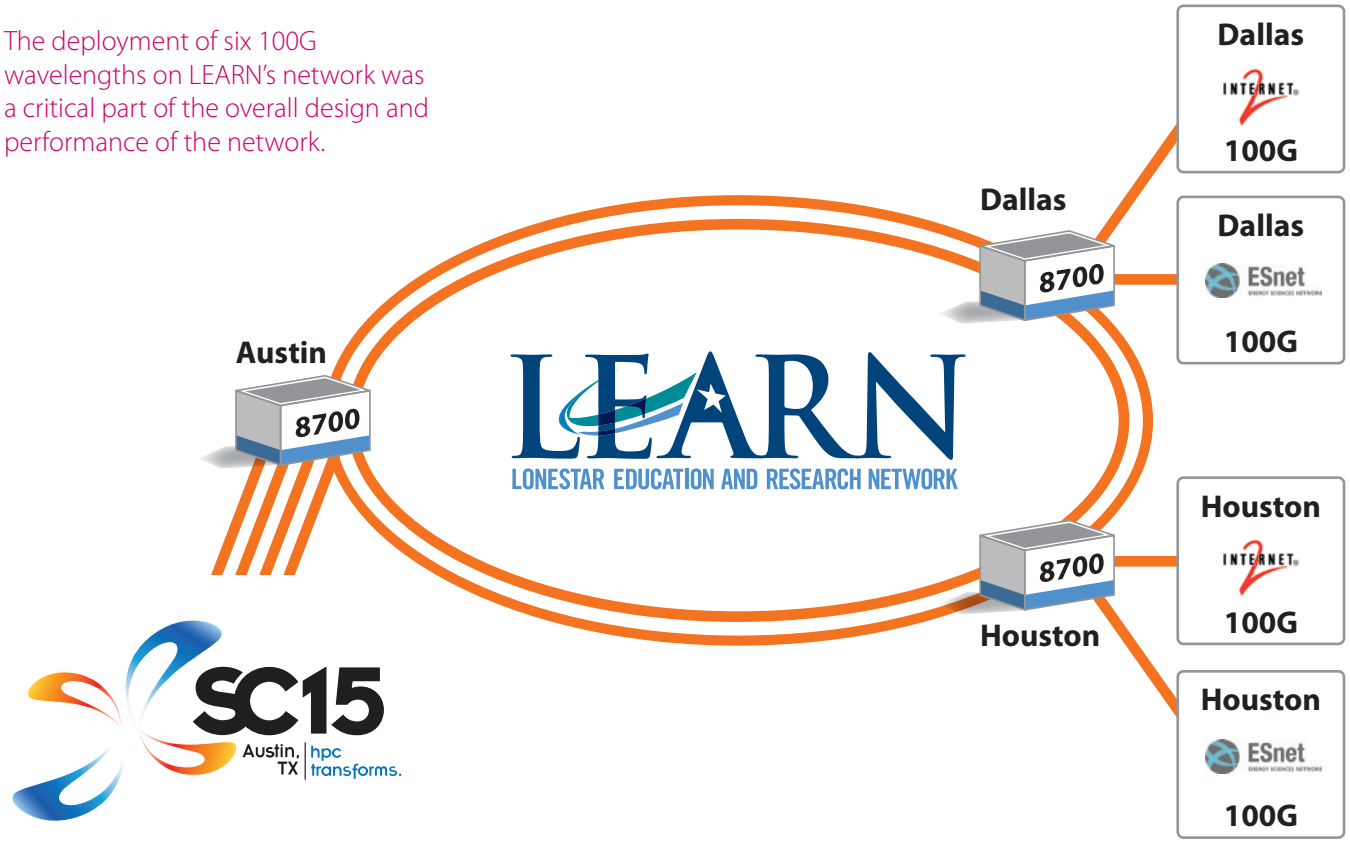
The performance of the network was exceptional and LEARN's optical infrastructure successfully transported over 1.7PB of SC15 traffic flows from Internet2 and ESnet during the conference and its research demonstrations. LEARN also provided SC15, two 10G diverse paths for Commodity Internet Service, which provided high-speed Wi-Fi access for exhibitors, attendees and conference attendees.

Examples of the types of demonstrations that were enabled by the SCinet network include:

- NASA requires the processing and exchange of ever increasing vast amounts of scientific data, so NASA networks must scale up to higher speeds. However, it is not sufficient to simply have 100G network pipes, since normal data transfer rates would not even fill a 1G pipe. The NASA Goddard High End Computer Networking (HECN) team demonstrated systems and techniques to achieve near 100G line-rate disk-to-disk data transfers between a single pair of high performance RAID servers across a national wide area 100G network that included an affordable 100G firewall built by the HECN team. Additionally, the HECN team demonstrated the ability of Software Defined Networking Exchanges (SDX) to dynamically establish the 100G Layer 2 network path that is required for very large data flows.

LEARN staff chaired the WAN Initiatives Team at SC15.

The deployment of six 100G wavelengths on LEARN's network was a critical part of the overall design and performance of the network.



- The International Center for Advanced Internet Research (iCAIR) showcased PetaTrans – a 100G data transfer node (DTN) for wide area networks (WAN), that will be especially useful for trans-oceanic WANs to support high performance transport for petascale science. This DTN is being designed by iCAIR specifically to optimize capabilities for supporting large scale, high capacity, high performance, reliable, high quality, sustained individual data streams for science research. As a component of a National Science Foundation project (NSF), PetaTrans is being designed, created and implemented as a prototype, and it is being used for experiments with edge servers configured with 100G NICs. This DTN has been optimized for supporting high capacity individual data streams on a data plane for science research over many thousands of miles. The DTN has also been designed to ensure high performance for those streams and to support highly reliable services for long duration data flows. This prototype model for the DTN design is being integrated with a prototype SDX.

These two demonstrations reflect the type of network research and advancements that are essential to supporting global scale "big data" transformational science and other research. Hosting this prestigious conference brought international recognition for the strategic role of LEARN and the leadership position that Texas plays in research.

Stars and nebula clouds in deep space.

SMU PHYSICISTS CONTRIBUTE TO OUR UNDERSTANDING OF THE UNIVERSE

Physicists at Southern Methodist University (SMU) have developed a new methodology to precisely measure a key subatomic particle, which may help us understand the deepest mysteries of our universe. The building blocks for almost all of the visible matter in the universe is quarks. Top quarks are the most massive of all of the observed elementary particles in the universe. The focus of SMU researchers was developing a more precise measurement of the mass of top quarks. This new calculation methodology of the mass of top quarks will help guide physicists in evaluating competing theories and in formulating new theories about the nature of matter in the universe.

Top quarks rarely occur now, but were much more common after the "Big Bang" 13.8 billion years ago. One of six types of quarks, the top quark is the only one that can be observed. SMU researchers, and their colleagues from around the world, use particle accelerators and detectors to generate top quarks. These particle accelerators and detectors generate extremely large data sets, which require advanced networks like LEARN to access the data on a global scale to better understand the characteristics of the building blocks of the visible matter in the universe. In these studies the top quark can only be observed fleetingly in protons as it explodes and decays into other particles. Physicists are focusing on the top quark to better understand the composition of everyday matter.

The new measurement research was presented in August at the Third Annual Conference on Large Hadron Collider Physics in St. Petersburg, Russia and in September at the 8th International Workshop on Top Quark Physics in Ischia, Italy. The top quark is central to the electroweak force (how particles gain mass) and the strong force (how quarks interact) theories of the Standard Model of physics. The new measurement technique of the mass of the top quarks is pushing the limits of our understanding of these two theories of the Standard Model.

The methodology developed at SMU will be an important tool in understanding how Higgs boson, first observed in 2012, interacts with top quarks and other sub atomic particles. Coupled with the confirmation of the Higgs field, this new research on top quarks may usher in new theories about particles that go beyond the Standard Model.

While having a better understanding of the universe we live in is important, the research and tools that researchers are using in particle physics research are transforming aspects of our daily lives as well. Particle physics research is making significant contributions to important advances in molecular medicine, energy research, advanced manufacturing, data management and analysis, computing, and cancer research and treatment.

SHARING EXPERTISE & KNOWLEDGE A HALF A WORLD AWAY

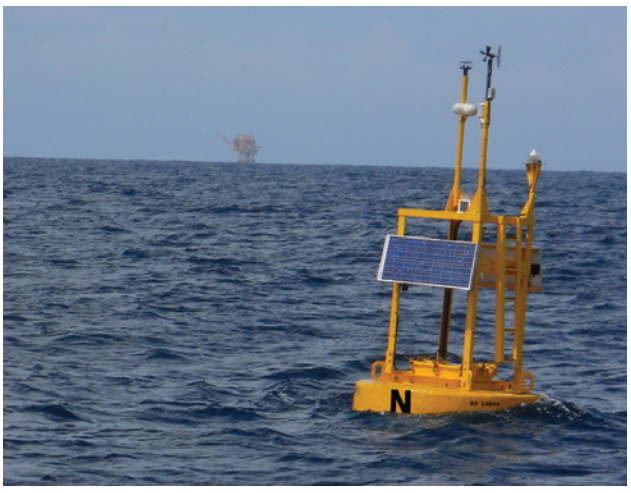
Texas A&M University (TAMU) is an international leader is oceanographic and marine research with a particular focus on the Gulf of Mexico (Gulf). TAMU has deployed observatories in the Gulf that monitor, in real time, a range of marine parameters that are impacted by the climate, the time of year, excess nitrogen that enters the Gulf from our rivers, oil spills and the ocean's changing currents. TAMU and the University of Haifa (Haifa) have announced an international partnership to leverage the expertise of both universities by establishing similar observatories in the eastern Mediterranean Sea.

Although the two bodies of water are half a world apart, researchers believe the Gulf and the Mediterranean are similar in many ways, which provides a unique opportunity for comparative analysis on how different environmental and other factors impact the water and its marine life. Drawing on the expertise and experience of TAMU, this multidisciplinary project will be led by TAMU's College of Geosciences and that will include staff from a number of different fields and disciplines.

Haifa officials acquired the permissions necessary to establish the observatory and the related moorings from a number of entities that share governance responsibilities in the Levant Basin of the Mediterranean. The project involves over 20 faculty members from the two universities, but that number is expected to grow as the data is utilized in multi-disciplinary research. Hoping to draw comparisons between Gulf data and modeling, the universities will use LEARN and other advanced networks to share their data, analysis, modeling and research. Both universities will also use their infrastructure and expertise to enable advanced weather and sea forecasting, improve ecosystem science and management, and enhance their understanding of these bodies of water and their coastal environments. This international partnership is strategically important, because of the impact the Gulf has on the 50 million people who live in Texas and other Gulf states and the 100 million people who live in the Levant area of the Mediterranean.

Faculty and student exchanges are also an important part of this project. Faculty from both institutions will regularly participate in joint symposiums and data modeling both in person and remotely using advanced networks. Advanced networks will also play an important role in enabling graduate and undergraduate students to participate in courses from both universities, accessing real time data for research projects and to help educate the public as a part of the outreach and service mission of both Texas A&M University and the University of Haifa.

The TABS buoy system provides real-time ocean observations at various locations in the Gulf of Mexico.



INNOVATION & PARTNERSHIPS ARE CRITICAL IN EDUCATING TEXAS CHILDREN

Educating students in our K–12 schools, who will become the next generation of leaders in Texas, is our most important responsibility and it is critical to the future of our great state. LEARN has partnered with the Texas Education Telecommunications Network (TETN) to leverage technology innovation to improve student learning and performance and to create economies of scale and efficiencies that save taxpayers money. TETN is a consortium of K–12 leaders and organizations that include the Texas Education Agency, the twenty Education Services Centers (ESC) and Independent School Districts in Texas. This innovative partnership has enabled the deployment of an integrated statewide network that provides a rich curriculum and educational experiences from around the world to over 1,000,000 students in over 520 Independent School Districts across Texas.

As a result of the leadership of ESC 11, in collaboration with their K–12 colleagues, the Connect2Texas program uses LEARN's advanced network to enable high quality interactive video and audio that brings a diverse portfolio of educational experiences from around the world into student classrooms that improves student learning and engagement. This program uses virtual experiences and real time interactive teacher-to-student and student-to-student learning and engagement to improve student performance. Texas organizations who are actively involved in this creative educational program include, but are not limited to, the Amon Carter Museum of American Art in Fort Worth, the National Cowgirl Museum and Hall of Fame in Fort Worth, the Fort Worth Zoo, the Perot Museum of Nature and Science in Dallas, the Bob Bullock Texas State History Museum in Austin, NASA's Johnson Space Center in Houston, and the George H. W. Bush Presidential Library in College Station.

By leveraging the LEARN network, the Region 13 ESC is providing teachers access to its Career and Technical Education Program (CTE). The CTE program is an accelerated 12 month program designed to provide an effective pathway to teacher certification for professionals who have the education, and work experience that is needed to become certified teachers in our K–12 schools in Texas.

Connect2Texas

EducatorCertificationProgram

This rigorous and innovative program uses best practices in proven instructional and learning theory and actual teaching experience to prepare teacher interns to become certified teachers who will prepare our K–12 students for higher education, and careers. Teachers from Abilene, Amarillo, Beaumont, Denton, El Paso, Houston, Huntsville, Killeen, Lubbock, Midland, Pittsburg, San Angelo, and San Antonio are participating in this important certification program.

The LEARN network is also providing access to a suite of applications in the Texas Computer Cooperative Software that is available to independent school districts to support their business, human resources, student services and Public Education Information Management System (PEIMS) data collection and reporting requirements. Additionally, the network is providing statewide access to the escWorks data management software that tracks the availability of professional development training opportunities and a record of the professional development courses taken by our K–12 professionals. These statewide shared resource initiatives are creating efficiencies in our school system that lowers administrative costs. As a result, a higher percentage of tax payer resources are being allocated to student learning.

The CTE program provides an accelerated pathway to teacher certification.

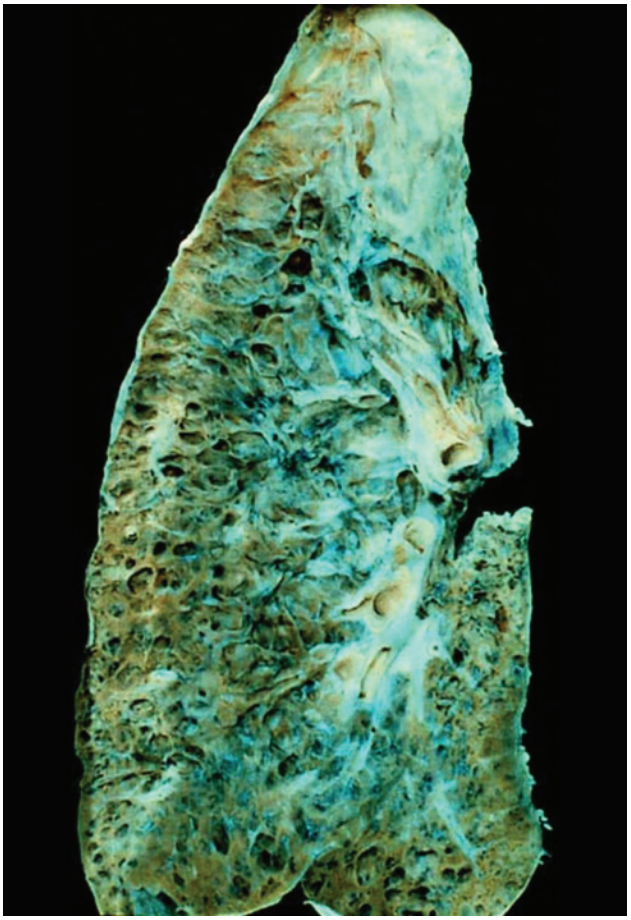
LEARN MEMBERS ARE LEADING THE FIGHT AGAINST PULMONARY FIBROSIS

The University of Texas Health Sciences Center at Houston, the University of Texas Southwestern Medical Center in Dallas, and the University of Texas Health Sciences Center in San Antonio have teamed up with 36 other prestigious health centers across the United States to combat a life threatening lung disease called pulmonary fibrosis. As a part of the Pulmonary Fibrosis Foundation's Care Center Network (CCN), these three members of the LEARN community will use LEARN, and other interconnected networks, to collaborate with colleagues across the country and share access to critical resources needed by patients, caregivers, physicians and scientists.

Pulmonary fibrous is a scarring of the lungs that worsens over time and may be caused by over 200 different lung diseases. These interstitial lung diseases affect the lung tissue itself rather than just the airways of the lung like asthma and bronchitis. Historically, pulmonary fibrous has been a fatal illness and lung transplants have been the only treatment option to extend the life expectancy of patients.

Healthcare professionals at CCN sites have extensive experience in the treatment of pulmonary fibrosis and are conducting groundbreaking research to improve the care and quality of life of patients with this disease. By collaborating in a multidisciplinary way across sites in the network, significant advancements are being made in patient care and in medical research.

Participating sites have developed a patient registry that uses standards for data collection procedures and controls to ensure that the data is accurate and that meaningful results can be obtained when the data is queried. The registry is an electronic database of anonymous patient information, from participating CCN sites, that is independently managed by a data coordinating center and accessible by all sites participating in the CCN. Data from the registry is used by healthcare professionals to better understand the disease and develop more effective individualized patient care strategies and therapies.



Lung with end-stage pulmonary fibrosis at autopsy.

In large part, as a result of the collaborative efforts of the CCN and the related patient registry, we have a much better understanding of the disease and new protocols have been developed that are making a difference in people's lives. Research has led to the development of newly approved drugs that offer the possibility of effective treatment for the first time and other medications are under development that hold great promise. In addition, advances in high resolution chest imaging that are shared among CCN sites using LEARN and other advanced networks, have made it possible to make a diagnosis without a biopsy. By participating in the CCN, Texas pulmonary fibrosis experts are improving patient care protocols and are making strategically important research contributions to find cures for this deadly disease.

Lonestar 5 cabinets

RESEARCHERS USE LEARN'S NETWORK TO ACCESS SHARED SUPERCOMPUTING RESOURCES

Researchers in Texas and throughout the world use the LEARN network to access the elite supercomputing resources of the Texas Advanced Computing Center (TACC) to collaborate and conduct transformational research. The latest addition to this world class facility is Lonestar 5, which is the second petaflop class system at TACC that is available to the engineering, science and medical researcher communities.

Lonestar 5 is jointly funded by the University of Texas System, the University of Texas at Austin, Texas Tech University and Texas A&M University. The system is the fifth supercomputing system to be shared by Texas universities over the past 15 years. Leveraging these critically important shared resources would not be possible without LEARN's advanced high performance network. Using the LEARN network, researchers from the contributing university partners are able to schedule access to Lonestar 5 via TACC's User Portal.

Lonestar 5 is a Cray XC40 supercomputer, which contains over 30,000 Intel Xeon cores and provides a peak performance of 1.25 petaflops. This new resource is far more powerful than Lonestar 4 with 50% more microprocessor cores and a peak performance that is 400% faster than its predecessor. This significant "upgrade" was needed to meet the growing demand of Texas researchers for access to supercomputing resources.

The university and private sector designers configured Lonestar 5 with the optimum balance of fast processors, larger than normal memory per core and interconnects that give researchers the ability to run very large models without having to wait in normal queues. This design enables researchers to test models and tune parameters more quickly to accelerate scientific discovery.

Texas is a leader in cutting edge research globally. Through partnerships between the public and private sectors, our researchers have access to advanced computing systems, visualization systems used to model the very large data sets that are generated by supercomputers, a high performance research network that is interconnected with other advanced networks globally, extensive data storage arrays and data analysis systems. For Texas to remain a leader in research and to compete for funding on a global scale, we must continue to create partnerships and make investments that will attract the best and brightest students and researchers to Texas.

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.

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's staff works closely with our members to align our network management practices and performance with their needs.

The vast majority of LEARN's network topology 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. 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 continued to provide reliable service for our customers. Our FrameNet or Layer 2 services and Layer 3 services, on our backbone, were available without disruption. Our WaveNet Layer 1 services, on our backbone, were also available without disruption. Our WaveNet services, on our Beaumont spur were available 99.992% of the time. While these performance levels are very favorable compared with other telecommunications companies, LEARN is always exploring strategies to improve the availability of the network and customer satisfaction.

During the year, as a part of LEARN's strategy to continue to improve the availability of the network, additional monitoring and reporting tools were deployed. Engineers also deployed additional performance measurement and network management tools, as a part of our ongoing strategy. Additionally, enhancements were made to our comprehensive database that provides a centralized source for asset, network configuration, circuits and other strategically important data that is an essential component of LEARN's overall strategy to continuously improve the operational performance and efficiency of our growing network.

LEARN uses light from lasers to transport large data sets.

APPENDICES

BOARD OF DIRECTORS

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& Dean of University Libraries
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& Universities (NETnet)

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Texas Tech University Health Sciences Center at El Paso

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Texas Woman's University

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Information Technology Services
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University of Texas at Dallas

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University of Texas at El Paso

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Interim Vice Provost, Information Technology & CIO
University of Texas at San Antonio

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University of Texas Health Science Center at San Antonio

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University of Texas MD Anderson Cancer Center

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University of Texas Southwestern
Medical Center at Dallas

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Associate Vice Chancellor, Systemwide
Information Services & CIO
University of Texas System

FINANCIAL STATEMENTS

Ingrid Edwards CPA PC

8500 N. Mopac, Suite 605,
Austin, TX 78759
512-582-0118

Member of American Institute of Certified Public Accountants

Member of Texas Society of Certified Public Accountants

INDEPENDENT ACCOUNTANT'S COMPILATION REPORT

To the Board of Directors
Lonestar Education and Research Network
Lubbock, TX

Management is responsible for the accompanying financial statements of Lonestar Education and Research Network (a nonprofit organization), which comprise the statement of financial position as of December 31, 2015, and the related statement of activities for the year then ended in accordance with accounting principles generally accepted in the United States of America. I have performed a compilation engagement in accordance with Statements on Standards for Accounting and Review Services promulgated by the Accounting and Review Services Committee of the AICPA. I did not audit or review the financial statements nor was I required to perform any procedures to verify the accuracy or completeness of the information provided by management. Accordingly, I do not express an opinion, a conclusion, nor provide any form of assurance on these financial statements.

Management has elected to omit substantially all of the disclosures and statement of cash flow required by accounting principles generally accepted in the United States of America. If the omitted disclosures and statement of cash flow were included in the financial statements, they might influence the user's conclusion about the Organization's financial position, changes in assets, and cash flow. Accordingly, these financial statements are not designed for those who are not informed about such matters.

January 30, 2016

Certified Public Accountant

STATEMENT OF FINANCIAL POSITION DECEMBER 31, 2015

	Current Operating Funds		
	Program Fund	Network Fund	Total
ASSETS			
CURRENT ASSETS			
Cash & cash equivalents	910,245	13,562,516	14,472,761
Accounts receivable: Network services	-	63,960	63,960
Prepaid expenses	-	37,720	37,720
Funds held by others	1,900	-	1,900
Total Current Assets	912,145	13,664,196	14,576,341
PROPERTY & EQUIPMENT			
Network equipment	-	8,231,869	8,231,869
Furniture & equipment	69,422	-	69,422
	69,422	8,231,869	8,301,291
Less accumulated depreciation	(61,253)	(6,525,582)	(6,586,835)
Property & Equipment - net	8,169	1,706,287	1,714,456
OTHER ASSETS			
Network & IRU access rights	-	9,540,667	9,540,667
Less accumulated amortization	-	(4,716,669)	(4,716,669)
Total Other Assets	-	4,823,998	4,823,998
TOTAL ASSETS	$ 920,314	$ 20,194,481	$ 21,114,795
LIABILITIES & NET ASSETS			
CURRENT LIABILITIES			
Deferred revenue	-	398,705	398,705
Accounts payable	77,899	87,740	165,639
Credit cards payable	14,423	2,520	16,943
Capital leases payable - current portion	-	15,000	15,000
Total Current Liabilities	92,322	503,965	596,287
LONG TERM LIABILITIES			
Capital leases net of current portion	-	52,056	52,056
Total Liabilities	92,322	556,021	648,343
NET ASSETS			
Unrestricted net assets	827,992	10,677,206.00	11,505,198
Unrestricted board designated net assets	-	-	-
Life cycle replacement	-	8,871,310	8,871,310
Member balances	-	89,944	89,944
Total Net Assets	827,992	19,638,460	20,466,452
TOTAL LIABILITIES AND NET ASSETS	$ 920,314	$ 20,194,481	$ 21,114,795

STATEMENT OF ACTIVITIES FOR THE YEAR ENDED DECEMBER 31, 2015

	Current Operating Funds		
	Unrestricted		
	Program Fund	Network Fund	Total
REVENUES AND OTHER SUPPORT			
Membership dues	780,000.00	-	780,000
Network services	-	6,717,799	6,717,799
Investment income	4,123	68,840	72,963
NET ASSETS RELEASED FROM RESTRICTIONS:			
Fund transfers	693	(693)	-
TOTAL REVENUES AND OTHER SUPPORT	$ 784,816	$ 6,785,946	$ 7,570,762
EXPENSES PROGRAM SERVICES			
Connections and fibers	-	2,889,054	2,889,054
Installation	-	51,131	51,131
Network parts and supplies	-	15,304	15,304
Amortization	-	588,623	588,623
Depreciation	-	695,259	695,259
Total Program Expenses	-	4,239,371	4,239,371
SUPPORTING SERVICES			
Professional fees			
Administration	385,378	548,857	934,235
Consulting	3,396	22,225	25,621
Auditing	18,750	-	18,750
Accounting	9,297	-	9,297
Legal	5,741	-	5,741
Salaries and wages	41,876	213,059	254,935
Sponsored meetings	163,752	-	163,752
Travel	28,986	41,610	70,596
Insurance	48,875	-	48,875
Office rent	23,325	-	23,325
Membership dues	19,980	-	19,980
Books and subscriptions	1,011	16,982	17,993
Office expenses	15,360	2,133	17,493
Payroll taxes	3,326	10,847	14,173
Computer and software supplies	5,874	5,514	11,388
Telephone	9,291	240	9,531
Office utilities and maintenance	4,890	-	4,890
Depreciation	4,860	-	4,860
Total Supporting Services	793,968	861,467	1,655,435
TOTAL EXPENSES	$ 793,968	$ 5,100,838	$ 5,894,806
CHANGES IN NET ASSETS	(9,152)	1,685,108	1,675,956
NET ASSETS:			
Beginning balance at January 1, 2015	837,144	17,953,352	18,790,496
Ending balance at December 31, 2015	$ 827,992	$ 19,638,460	$ 20,466,452

AFFILIATED ORGANIZATIONS

COLLEGES

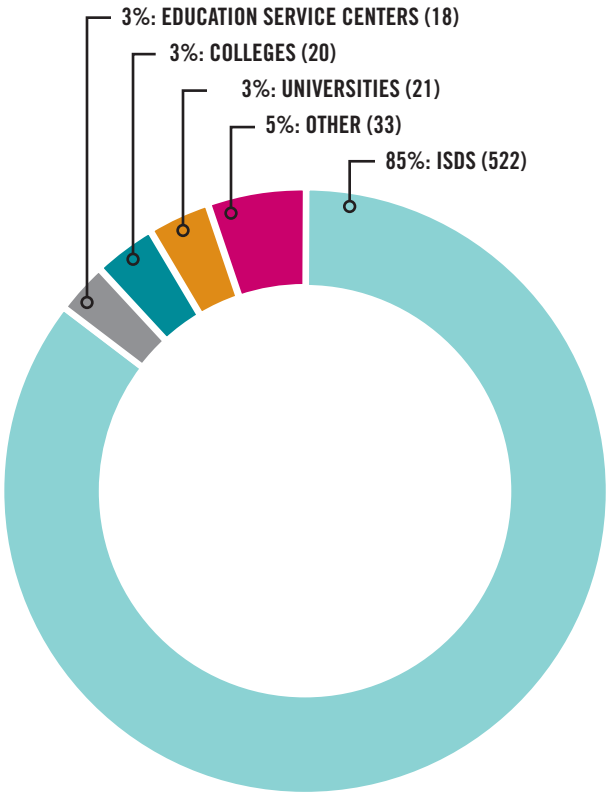
Angelina College
Austin Community College
Blinn College
Brazosport College
Del Mar College
Galveston College
Houston Community College
Kilgore College
Lamar Institute of Technology
Lamar State College – Orange
Lamar State College – Port Arthur
Midland College
Navarro College
Northeast Texas Community College
Panola College
Paris Junior College
Texarkana College
Trinity Valley Community College
Tyler Junior College
Victoria College

EDUCATION SERVICE CENTERS

Education Service Center – Region 1
Education Service Center – Region 2
Education Service Center – Region 3
Education Service Center – Region 4
Education Service Center – Region 5
Education Service Center – Region 6
Education Service Center – Region 7
Education Service Center – Region 8
Education Service Center – Region 9
Education Service Center – Region 11
Education Service Center – Region 13
Education Service Center – Region 14
Education Service Center – Region 15
Education Service Center – Region 16
Education Service Center – Region 17
Education Service Center – Region 18
Education Service Center – Region 19
Education Service Center – Region 20

ISDS

Abernathy ISD
Adrian ISD
Albany ISD
Alief ISD
Alpine ISD
Alto ISD
Amherst ISD
Anderson-Shiro CISD
Andrews ISD
Angleton ISD
Anson ISD
Anton ISD
Apple Springs ISD
Archer City ISD
Aspermont ISD
Atlanta ISD
Aubrey ISD
Austin ISD
Austwell-Tivoli ISD
Avery ISD
Avinger ISD
Baird ISD
Balmorhea ISD
Bangs ISD
Banquete ISD
Bartlett ISD
Bastrop ISD
Bellevue ISD
Ben Bolt-Palito Blanco ISD
Benavides ISD
Benjamin ISD
Big Sandy ISD
Birdville ISD
Blackwell CISD
Blanco ISD
Blanket ISD
Bloomburg ISD
Bluff Dale ISD
Bob Hope Charter School
Boling ISD
Booker ISD
Borden County ISD
Borger ISD
Bovina ISD
Bowie ISD
Boys Ranch ISD
Brackett ISD



Brady ISD
Brazos ISD
Brazos School for Inquiry & Creativity
Breckenridge ISD
Brenham ISD
Bridge City ISD
Broaddus ISD
Brock ISD
Bronte ISD
Brookeland ISD
Brooks County ISD
Brooksmith ISD
Brownfield ISD
Brownwood ISD
Bryson ISD
Buckholts ISD
Buena Vista ISD
Bullard ISD
Buna ISD
Burkburnett ISD
Burkeville ISD
Burnet CISD
Burton ISD
Caldwell ISD
Calhoun County ISD
Calvert ISD
Canadian ISD
Canyon ISD
Carthage ISD
Castleberry ISD
Cayuga ISD
Centerville ISD
Channelview ISD
Channing ISD
Chapel Hill ISD
Chester ISD
Childress ISD
Chillicothe ISD
Chisum ISD
Christoval ISD
Cisco ISD
City View ISD
Clarendon ISD
Clarksville ISD
Claude ISD
Clint ISD
Clyde CISD
Coahoma ISD
Coldspring-Oakhurst CISD
Coleman ISD
Colmesneil ISD
Colorado ISD
Comal ISD
Comanche ISD
Comfort ISD
Como-Pickton CISD
Comstock ISD
Cooper ISD
Cotton Center ISD
Coupland ISD
Crane ISD
Crockett County Consolidated CSD
Crockett ISD
Crosbyton CISD
Cross Plains ISD
Cross Roads ISD
Crowell ISD
Culberson County ISD
Cumby ISD
Daingerfield-Lone Star ISD
Damon ISD
Danbury ISD
Darrouzett ISD
Dawson ISD
De Leon ISD
Dekalb ISD
Del Valle ISD
Denton ISD
Detroit ISD
Deweyville ISD
D'Hanis ISD
Dime Box ISD
Dimmitt ISD
Doss Consolidated CSD
Douglass ISD
Dripping Springs ISD
Early ISD
East Central ISD
East Chambers ISD
East Fort Worth Montessori Academy
Eastland ISD
Eden ISD
Edna ISD
Ehrhart School
Electra ISD
Era ISD
Erath Excels Academy, Inc.
Etoile ISD
Eula ISD
Evadale ISD
Excelsior ISD
Ezzell ISD
Fannindel ISD
Fayetteville ISD
Flatonia ISD
Floydada ISD
Follett ISD
Forestburg ISD
Forsan ISD
Fort Davis ISD
Fort Elliott CISD
Fort Sam Houston ISD
Fort Stockton ISD
Frankston ISD
Fredericksburg ISD
Freer ISD
Galena Park ISD
Gause ISD
George West ISD
Giddings ISD
Glasscock County ISD
Godley ISD
Gold Burg ISD
Goliad ISD
Gonzales ISD
Good Shephard Network
Goodrich ISD
Gordon ISD
Gorman ISD
Grady ISD
Graford ISD
Grandfalls-Royalty ISD
Grandview-Hopkins ISD
Granger ISD
Grape Creek ISD

Grapeland ISD
Greenwood ISD
Groom ISD
Groveton ISD
Gruver ISD
Gustine ISD
Hale Center ISD
Hamlin ISD
Happy ISD
Hardin-Jefferson ISD
Harlingen CISD
Harper ISD
Harrold ISD
Hart ISD
Hartley ISD
Haskell CISD
Hawley ISD
Hedley ISD
Hemphill ISD
Hempstead ISD
Henrietta ISD
Hermleigh ISD
Hidalgo ISD
Higgins ISD
High Island ISD
Highland ISD
Highland Park ISD
Holliday ISD
Holy Cross
Hooks ISD
Hubbard ISD
Huckabay ISD
Idalou ISD
Industrial ISD
Iola ISD
Iowa Park CISD
Ira ISD
Iraan-Sheffield ISD
Irion County ISD
Jacksboro ISD
Jarrell ISD
Jim Hogg County ISD
Jim Ned CISD
Johnson City ISD
Joshua ISD
Junction ISD
Karnes City ISD
Kelton ISD
Kenedy ISD
Kennard ISD
Kennedale ISD
Kermit ISD
Kingsville ISD
Kinkaid School
Kirbyville CISD
Klondike ISD
Knox City-O'Brien CISD
Kountze ISD
Kress ISD
La Gloria ISD
La Grange ISD
Lackland ISD
Lake Travis ISD
Lake Worth ISD
Lamar ISD
Laneville ISD
Lapoynor ISD
Latexo ISD
Leary ISD
Lefors ISD
Leggett ISD
Leon ISD
Leveretts Chapel ISD
Liberty Hill ISD
Liberty-Eylau ISD
Linden-Kildare CISD
Lindsay ISD
Lingleville ISD
Lipan ISD
Little Cypress-Mauriceville CISD
Littlefield ISD
Lockhart ISD
Lockney ISD
Loop ISD
Loraine ISD
Lorenzo ISD
Lovelady ISD
Lueders-Avoca ISD
Luling ISD
Lumberton ISD
Lytle ISD
Madisonville CISD
Malakoff ISD
Malta ISD
Mansfield ISD
Marfa ISD
Martins Mill ISD
Mason ISD
Matagorda ISD
Maud ISD
May ISD
McCamey ISD
McDade ISD
McLean ISD
McLeod ISD
McMullen County ISD
Meadow ISD
Medina Valley ISD
Memphis ISD
Menard ISD
Merkel ISD
Meyersville ISD
Miami ISD
Midland Academy Charter
Milano ISD
Miles ISD
Miller Grove ISD
Mission CISD
Monahans-Wickett-Pyote ISD
Monsignor Kelly Catholic High School
Montague ISD
Moran ISD
Morgan Mill ISD
Morton ISD
Moulton ISD
Mount Enterprise ISD
Mount Vernon ISD
Muenster ISD
Mumford ISD
Munday CISD
Murchison ISD
Natalia ISD
Navarro ISD
Navasota ISD
Nazareth ISD

Neches ISD
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New Braunfels ISD
New Deal ISD
New Home ISD
Newcastle ISD
Newton ISD
Nixon-Smiley CISD
Nocona ISD
Normangee ISD
North Hopkins ISD
North Lamar ISD
Northside ISD
Nueces Canyon ISD
Nursery ISD
Oakwood ISD
O'Donnell ISD
Olfen ISD
Olney ISD
Onalaska ISD
Orange Grove ISD
Orangefield ISD
Overton ISD
Paint Creek ISD
Paint Rock ISD
Palacios ISD
Palo Pinto ISD
Pampa ISD
Panhandle ISD
Panther Creek ISD
Paris ISD
Peaster ISD
Pecos-Barstow ISD
Perrin-Whitt CISD
Perryton ISD
Petersburg ISD
Petrolia ISD
Pewitt CISD
Pilot Point ISD
Pine Tree ISD
Pittsburg ISD
Plains ISD
Pleasant Grove ISD
Plemons-Stinnett-Phillips CISD
Point Isabel ISD
Ponder ISD
Poolville ISD
Port Aransas ISD
Port Arthur ISD
Post ISD
Prairie Lea ISD
Prairie Valley ISD
Prairiland ISD
Presidio ISD
Pringle-Morse CISD
Progreso ISD
Quanah ISD
Queen City ISD
Ralls ISD
Ranger ISD
Raven School
Reagan County ISD
Red Lick ISD
Redwater ISD
Refugio ISD
Richards ISD
Richland Springs ISD
Rio Vista ISD
Rising Star ISD
River Road ISD
Robert Lee ISD
Roby CISD
Rochelle ISD
Rocksprings ISD
Roma ISD
Roosevelt ISD
Roscoe ISD
Rotan ISD
Round Top-Carmine ISD
Roxton ISD
Rule ISD
Runge ISD
Sabinal ISD
Sabine ISD
Sabine Pass ISD
Saint Jo ISD
Saltillo ISD
San Diego ISD
San Isidro ISD
San Saba ISD
San Vincent ISD
Sands CISD
Sanford-Fritch ISD
Santa Anna ISD
Santa Maria ISD
Santa Rosa ISD
Schertz-Cibolo-Universal City ISD
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Schulenburg ISD
Seagraves ISD
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Seymour ISD
Shallowater ISD
Shamrock ISD
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Shelbyville ISD
Shepherd ISD
Shiner ISD
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Smyer ISD
Snyder ISD
Somerville ISD
Sonora ISD
Spearman ISD
Spring Creek ISD
Spring Hill ISD
Spurger ISD
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St. Vincent de Paul School
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Stanton ISD
Sterling City ISD
Stockdale ISD
Strake Jesuit College Prepatory
Stratford ISD
Strawn ISD
Sulphur Bluff ISD
Sulphur Springs ISD
Sundown ISD

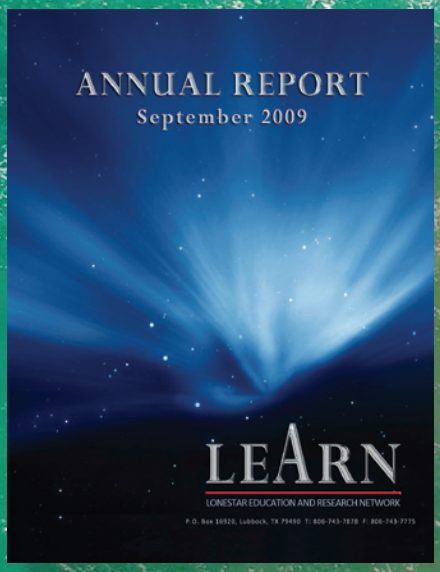
Sunray ISD
Sweeny ISD
Sweet Home ISD
Sweetwater ISD
Taft ISD
Tahoka ISD
Tarkington ISD
Tenaha ISD
Terlingua ISD
Terrell County ISD
Texas School for the Blind & Visually Impaired
Texhoma ISD
Texline ISD
The Oakridge School
Thorndale ISD
Thrall ISD
Three Rivers ISD
Three Way ISD
Throckmorton ISD
TLC Academy
Tolar ISD
Trent ISD
Trinidad ISD
Tulia ISD
Tuloso-Midway ISD
Valentine ISD
Valley View ISD
Vega ISD
Veribest ISD
Vernon ISD
Victoria ISD
Vidor ISD
Vysehrad ISD
Waelder ISD
Walcott ISD
Wall ISD
Walnut Bend ISD
Warren ISD
Water Valley ISD
Webb CISD
Wellington ISD
Wellman-Union CISD
Wells ISD
West Orange-Cove CISD
West Oso ISD
West Rusk ISD
West Sabine ISD
Westbrook ISD
Westhoff ISD
Wharton ISD
Wheeler ISD
White Deer ISD
Whiteface CISD
Whitharral ISD
Wichita Falls ISD
Wildorado ISD
Wilson ISD
Wimberley ISD
Windthorst ISD
Winfield ISD
Wink-Loving ISD
Winters ISD
Woden ISD
Woodson ISD
Woodville ISD
Wylie ISD
Yoakum ISD
Yorktown ISD
Zavalla ISD
Zephyr ISD

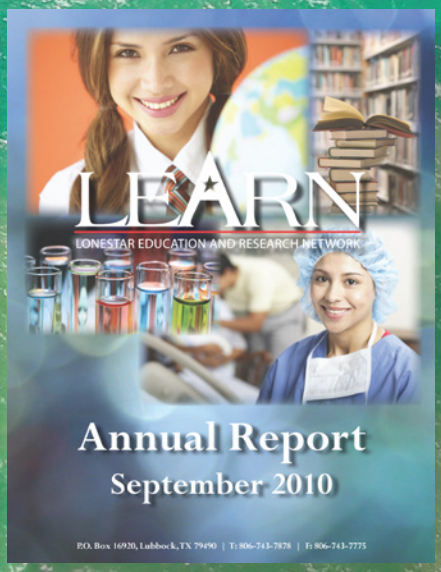
UNIVERSITIES

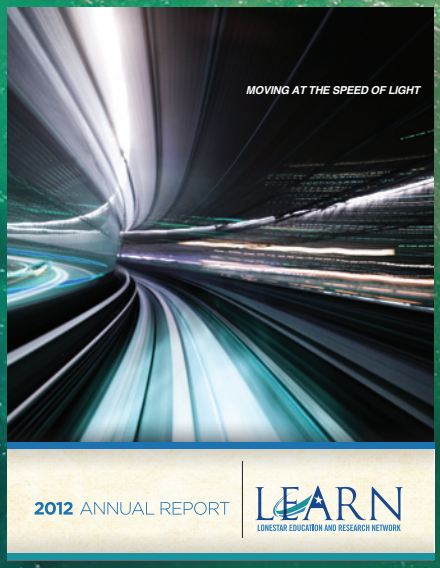
Southwestern Adventist University – C.S. Dept.
Sul Ross State University
Sul Ross State University Rio Grande College
Tarleton State University
Texas A&M International University
Texas A&M University – Central Texas
Texas A&M University – Commerce
Texas A&M University – Kingsville
Texas A&M University – San Antonio
Texas A&M University – Texarkana
Texas A&M University at Galveston
Texas Southern University
University of Houston – Clear Lake
University of Houston – Downtown
University of Houston – Victoria
University of North Texas Health Science Center
University of North Texas at Dallas
University of Texas – Permian Basin
University of Texas at Tyler
University of the Incarnate Word of San Antonio
West Texas A&M University

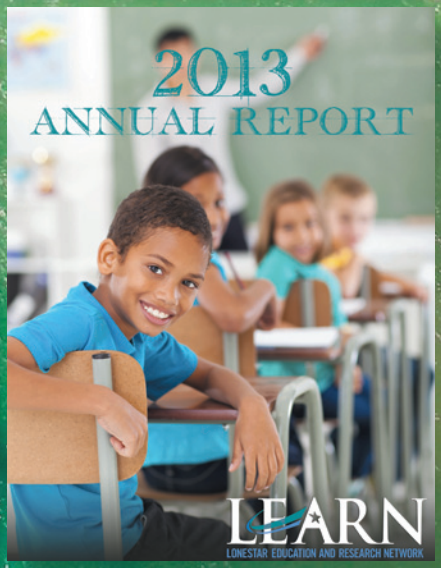
OTHER

Alamo Area Council of Governments
Brazos Valley Affordable Housing
Brazos Valley Council of Governments (BVCOG)
Brazos Valley Council on Alcohol & Substance Abuse
Brazos Valley Small Business Development Council
Bryan/College Station Chamber of Commerce
Citizen's Medical Center – Victoria
City of Austin Information Services
Duncanville Public Library
Fort Worth Public Library
Grimes County Clerk's Office
Guadalupe Valley Hospital
Houston Metro
Internet2
Lower Colorado River Authority
Mesquite Public Library
Mission Hospital
Newton County Library
NOAA
Orange County
Parkland Memorial Hospital
Project Unity
Texas AgriLife Extension Service
Texas AgriLife Research
Texas Engineering Experiment Station
Texas Engineering Extension Service
Texas Forest Service
Texas Transportation Institute
Texas Veterinary Medical Diagnostic Lab
The Houston Museum of Natural Science
Travis County
Washington County
Wharton County Library









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