



OKLAHOMA'S PARTNER IN RESEARCH & SCIENTIFIC DISCOVERY



CLIMATE SCIENCE | HIGH ENERGY PHYSICS | GENOMIC RESEARCH



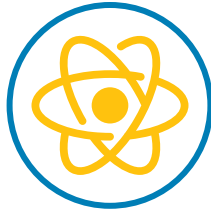
OKLAHOMA'S PARTNER IN RESEARCH AND DISCOVERY

Scientific discoveries at Oklahoma's research institutions are advancing innovation in global research initiatives from high-energy physics to bioscience to climate modeling. These initiatives require high-capacity bandwidth to support big data movement in real-time across the country and around the globe. OneNet is Oklahoma's partner in providing the high-speed connectivity required for innovation and scientific discovery. As a division of the Oklahoma State Regents for Higher Education, OneNet serves as Oklahoma's research and education network and is strategically positioned within higher education, like many research and education networks across the country, to support research computing and networking at Oklahoma's colleges and universities.



OKLAHOMA STATE REGENTS
FOR HIGHER EDUCATION

Improving our future by degrees



ATLAS PROJECT

The Oklahoma Center for High Energy Physics (OCHEP) is a collaboration of researchers at the University of Oklahoma, Oklahoma State University and Langston University. OCHEP scientists are conducting research for the ATLAS project, a high-energy physics experiment at the Large Hadron Collider at the European Organization for Nuclear Research. ATLAS explores the fundamental nature of matter and the basic forces that shape our universe by examining head-on collisions of protons of enormously high energy. These particle physics experiments have large data transfer requirements supported by OneNet.

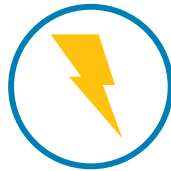


WARN-ON-FORECAST

One nationwide organization that relies on OneNet is the National Oceanic and Atmospheric Administration (NOAA). In partnering with the University of Oklahoma and OU's Cooperative Institute for Mesoscale Meteorological Studies, NOAA utilizes OneNet's network to improve severe weather forecasting through their Warn-on-Forecast research. Scientists hope to issue more advanced weather warnings by designing a system reliable enough to actually provide warnings with sufficient confidence that the event will happen, the timeframe of its onset and its geographical location.

SPRING EXPERIMENT

Each spring, the Center for Analysis and Prediction of Storms (CAPS) at the University of Oklahoma runs an ensemble of high-resolution weather prediction forecasts covering the continental United States. This set of forecasts, known as the Storm-Scale Ensemble Forecast, is part of the annual Spring Experiment, a collaboration among CAPS and research and operational units of the National Oceanic and Atmospheric Administration at the National Weather Center at OU. CAPS utilizes OneNet's network for daily data transfer across the country during the six-week experiment.





GENOMIC RESEARCH

Researchers at Oklahoma State University are utilizing high-performance supercomputers and OneNet's network to evaluate the use of fungi in biofuels, study pathogens that damage poultry populations, analyze the human genome for diseases and numerous other experiments that have real-life implications. OSU's participation in this research is making genome mapping to scan for genetic risks like cancer a routine health assessment for everyone. OSU collaborates with researchers across the country to advance these research initiatives and requires big data movement among research partners.



\$46 million in research grants since 2009

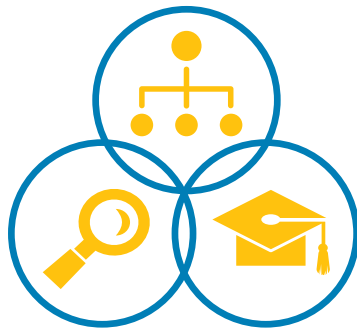
A photograph of three researchers in a laboratory setting, overlaid with a semi-transparent blue filter. On the left, a man with a beard and safety glasses is wearing a white lab coat and gloves, holding a small vial. In the center, another man with a beard and safety glasses is also in a white lab coat, looking down at a piece of equipment. On the right, a woman wearing a dark hijab and safety glasses is looking towards the center. They are surrounded by various lab equipment, including a rack of test tubes, a computer monitor, and other scientific instruments.

FUNDING RESEARCH COMPUTING

In addition to providing high-capacity broadband services, OneNet's partnership with Oklahoma's research institutions brings grant funding and jobs to the state. OneNet's network has helped Oklahoma higher education institutions bring \$46 million in research computing grants to the state since 2009. OneNet's connectivity also gives researchers the flexibility required to participate in emerging research initiatives, such as digital humanities, aerospace and STEM (Science, Technology, Engineering and Math) exploration.

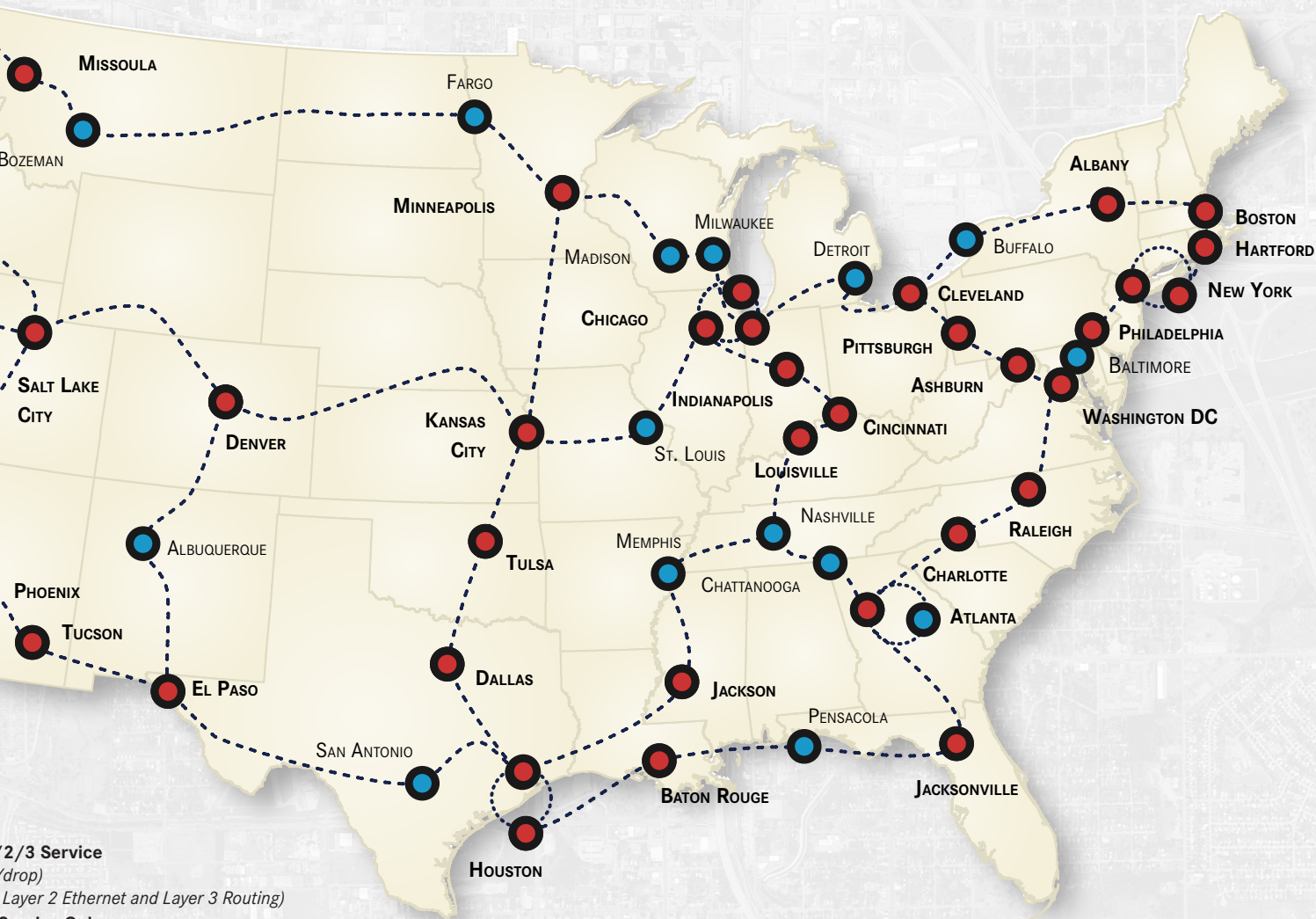
EXCLUSIVE ACCESS TO INTERNET2

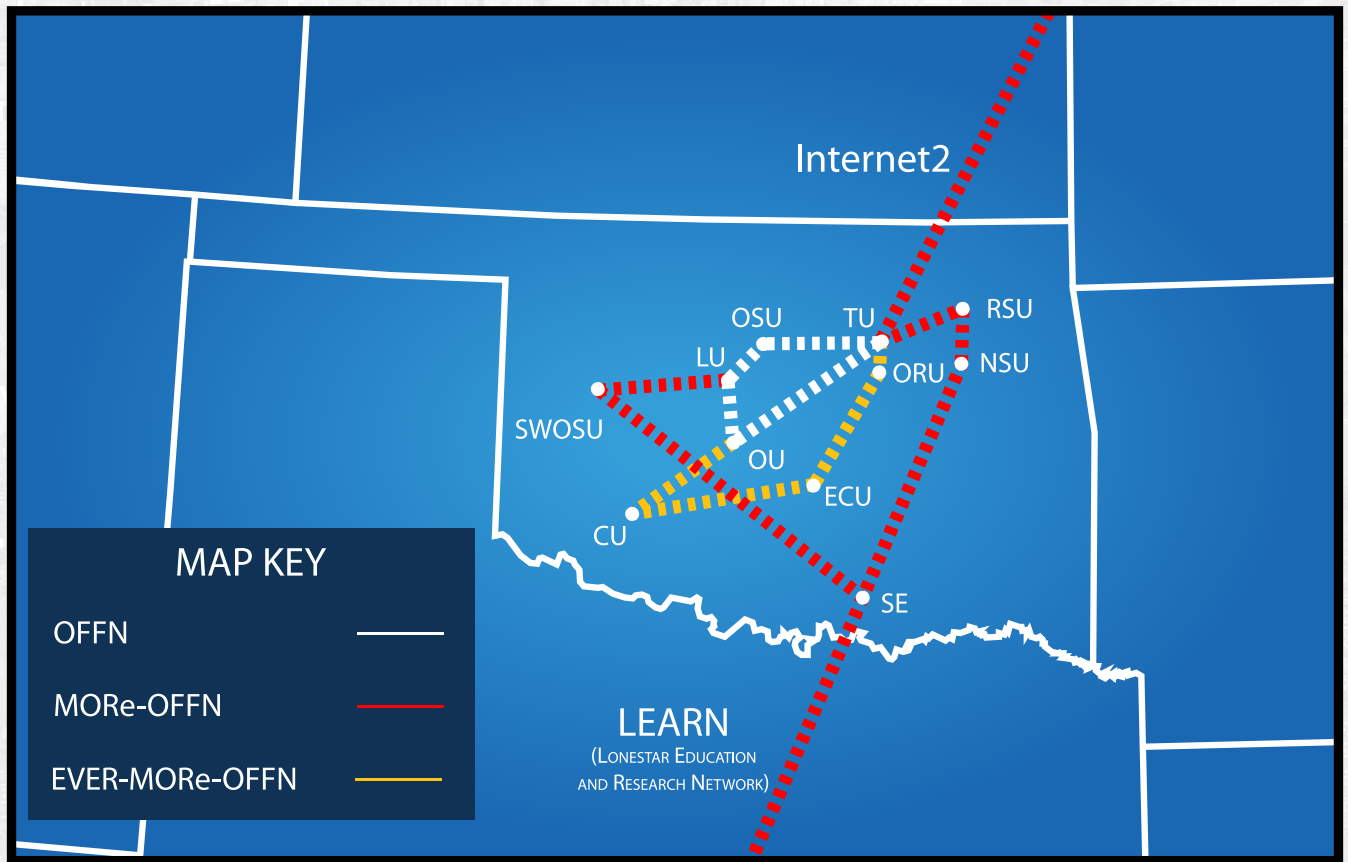
OneNet offers exclusive access to Internet2's research and education network. Internet2 operates the nation's largest and fastest, coast-to-coast, 100 Gbps network that was built to deliver advanced, customized services. Internet2 creates a collaborative environment where U.S. research and education organizations can solve common technology challenges and develop innovative solutions in support of their educational, research and community service missions.



INTERNET2 NETWORK INFRASTRUCTURE TOPOLOGY

DECEMBER 2019

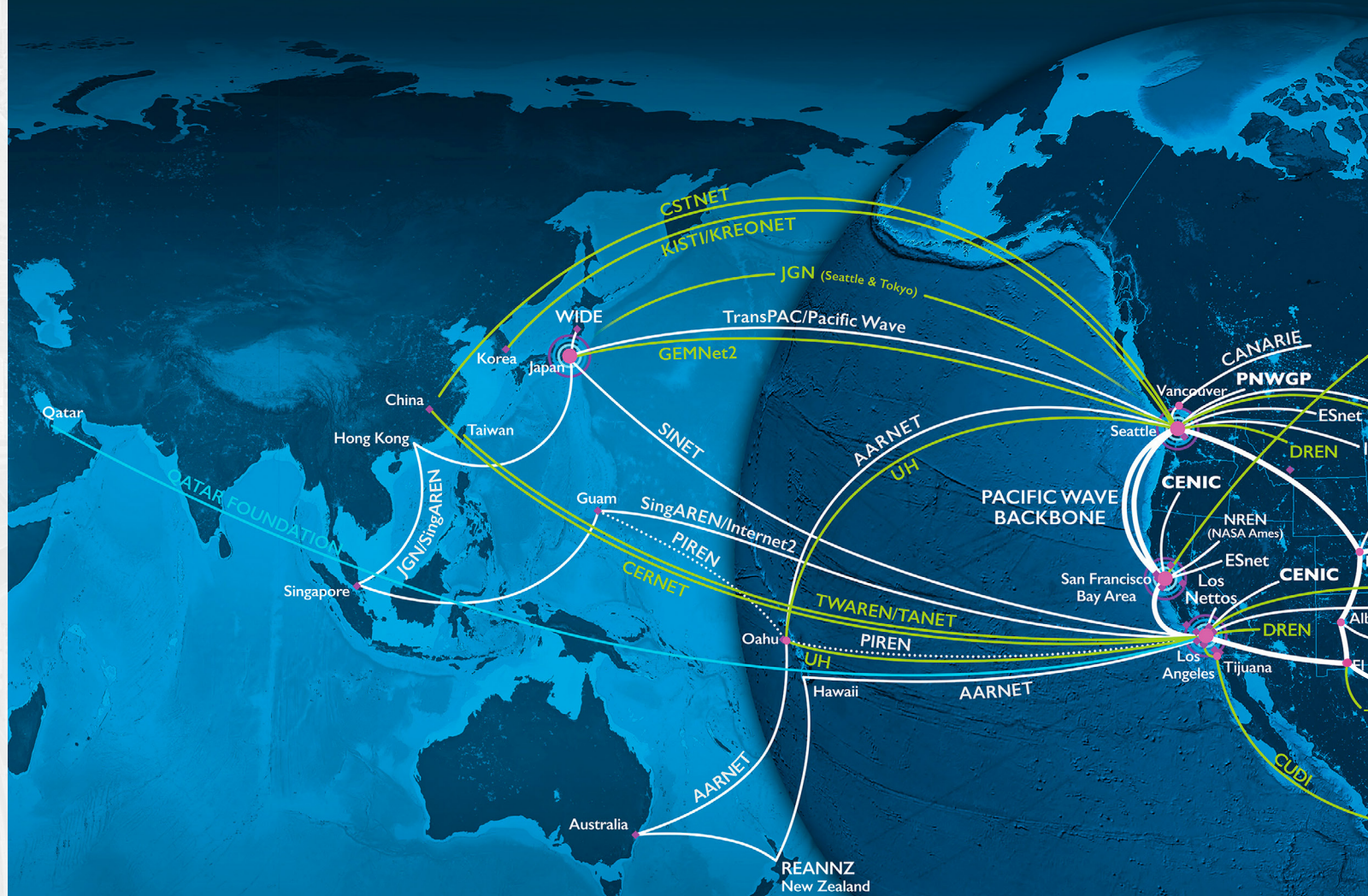




FAST LANE FOR BIG DATA TRANSFER

OneNet delivers high-speed connectivity for Oklahoma's research institutions through a network that includes a 100 Gbps optical fiber ring around the state, connecting the University of Oklahoma and Oklahoma State University to Internet2. This connection to Internet2, a 100Gbps nationwide network specifically for research and education, equips Oklahoma's scientists with the high capacity they need on a network dedicated to moving big data across the country for national and global research. OneNet also connects the OneOklahoma Friction Free Network, a 10 Gbps and 100 Gbps network ring that provides participants with a dedicated internet route that is much faster than traditional internet highways. This alternative pathway makes big data transfer, an often slow and painful task, a frictionless process. OneNet connects 11 universities conducting research to the OFFN network.

INTERNATIONAL PEERING EXCHANGE



SPEEDS/POPS

1 - 2.5 Gbps

10 Gbps

100 Gbps

CURRENT

FUTURE

- Pacific Wave POPs
- ◆ Pacific Research Platform (PRP)
- PRP Science DMZ Fabric
- Software Defined Network
- Commercial Peering Points (Amazon, Google, & Microsoft)

WESTERN REGIONAL NETWORK

States served by WRN members:

- ABQG: New Mexico GigaPoP
- CENIC: California
- FRGP: Colorado and Wyoming
- PNWGP: Washington, Montana, Alaska, Oregon & Idaho
- UH: Hawaii

PACIFIC WAVE IS A PROJECT OF CENIC & PACIFIC NORTHWEST GIGAPOP

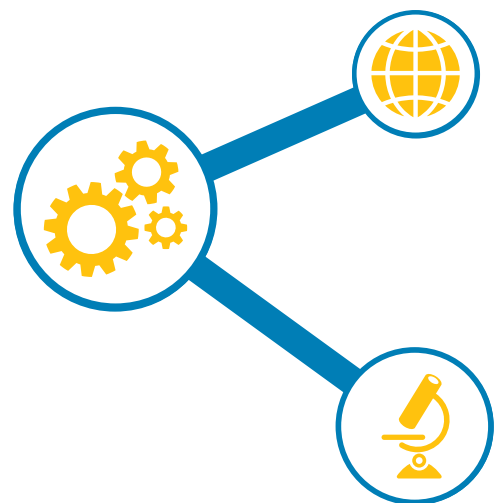


WITH SUPPORT FROM THE NATIONAL SCIENCE FOUNDATION



GLOBAL RESEARCH CONNECTIONS

OneNet's partnerships with Great Plains Network and Western Regional Network provide regional connectivity for the south central states and connections to the West Coast. Through these partnerships, OneNet is connected to Internet2 and the Pacific Wave International Exchange, which support advanced research and scientific discovery. These connections all work together to ensure research institutions have a dedicated fast lane on the internet highway to transfer research data globally.





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