Sunday, March 19, 2017 - Wednesday, March 22, 2017

Day One • Monday, March 20, 2017

Conference Opening

8:30 – 8:45 am, Monday, March 20, 2017

Louis Fox, President & CEO, CENIC

Jeff Weekley, Director of CyberInfrastructure & Research Computing, UC Merced, and Conference Committee Chair

Patrick Perry, Chief Information Officer, CSU, and Vice Chair, CENIC Board of Directors

Welcome to the CENIC Annual Conference.

LOCATION: La Jolla Ballroom

View from the Pacific — Strategic Directions

8:45 – 9:30 am, Monday, March 20, 2017

David Lassner, President, University of Hawaii

The University of Hawaii and its partners have made significant progress in fostering research and education (R&E) network capacity to interconnect Pacific Islands with each other and to the global R&E network fabric by building on previous projects and relationships. Hawaii has played an important role in furthering scientific research and cultural exchange in the region, with the mainland, and internationally.

LOCATION: La Jolla Ballroom

International R&E Networking

9:30 – 10:30 am, Monday, March 20, 2017

Catherin Stover, Vice President, GÉANT

Carlos Casasus, Director General of University Corporation for Internet Development (CUDI)

Steve Huter, Director, Network Startup Resource Center (NSRC)

Meoli Kashorda, Executive Director of the Kenya Education Network (KENET)

Jennifer Schopf, Director, International Networks, Indiana University (IU)

Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world.

- Louis Pasteur

Over the past two decades, regional and national networks have increased in both number and capacity. In the United States, through innovative programs like the National Science Foundation's International Research Network Connections Program, these networks are increasingly a global fabric of interconnections built to support global peering in research and education. Pasteur's quote above is as true now as when he conducted his groundbreaking work over a century ago. Our ability to share data, to collaborate with far-flung peers, and to access global scale instruments (instruments and access unimaginable a century ago) are enabled by this global fabric and provide opportunities for completely new information sharing. In many ways, we have barely begun to understand the magnitude of what is possible using this remarkable connectivity. In this panel, we will hear from international leaders in R&E Networking who will provide a view into how these networks enable science, education, cultural expression, and preservation across the globe.

LOCATION: La Jolla Ballroom

Break

10:30 – 11:00 am

Transition to breakout rooms

LOCATION: Pacifica A, Pacifica B, Learning Center

Distributed Caching – XRootd

11:00 am – 12:00 pm, Monday, March 20, 2017

Frank Wuerthwein, Executive Director, Open Science Grid, UCSD and San Diego Supercomputing Center

ATLAS and CMS—two experiments in particle physics using the Large Hadron Collider—have built global data federations that serve in excess of 100 Petabytes of disk space. The next logical step is to build caches into these federations to more easily integrate agile resources, reduce disk space needs, and hide WAN latencies. Professor Wuerthwein will discuss the process for building these caches, and report on work to develop a distributed XRootd cache across Caltech and UCSD. This cache uses the Pacific Research Platform on CalREN, allowing the two CMS Tier-2 centers at Caltech and UCSD to benefit from each other's disk space. Initial tests at SC16 indicate that the cache can reach in excess of 60 Gbps of network traffic.

LOCATION: Pacifica A

Securing the Human: Statewide Cybersecurity Education Program for California's K12 Agencies

11:00 – 12:00 pm, Monday, March 20, 2017

Dr. Emil Ahangarzadeh, Program Administrator for K-12 High-Speed Network Cybersecurity Education Program, Santa Anna Unified School District

A strong network defense posture can easily be thwarted if the end user is not properly trained. Having an out-of-date browser or reusing passwords across multiple applications/resources can lead to a devastating set of unexpected events. The end-user can be the most vulnerable aspect of a network environment, prone to phishing, email scams, ransomware and other targeted attacks focused on quickly gaining access to files, data or funds. California will be the first state in the nation to deploy a statewide cybersecurity education program for all K-12 public school employees. The session will provide an overview of the Cybersecurity Education Program curriculum and describe how it plays a part in a larger initiative to change people's online habits. The session will also detail how the effectiveness of the program will be measured.

LOCATION: Pacifica B

Innovative Partnerships—Creating Responsible Stewards in California Through Enhanced Network Capability

11:00 am – 12:00 pm, Monday, March 20, 2017

Matthew Smith, NWave New Service Manager, National Oceanic and Atmospheric Administration

California is home to a number of sites affiliated with the National Oceanic and Atmospheric Administration, including the National Marine Sanctuary—located within the Pt. Reyes National Seashore—and the Southwest Fisheries Science Center on the campus of UCSD. The research and public programs conducted by these sites and others enrich the lives both of Californians and of people around the world, now, through an innovative partnership between NOAA and CENIC, these sites have enhanced their networks while at the same time acting as good stewards of taxpayer dollars. This talk will describe how the partnership has developed and how it may evolve in the future.

LOCATION: Learning Center

Lunch

12:00 – 1:00 pm

Lunch & Networking

LOCATION: La Jolla Ballroom and Courtyard

California Libraries: The Future is Here, It's Just Unevenly Distributed

1:00-2:00 pm, Monday, March 20, 2017

Moderator: Paula MacKinnon, Interim Director, Califa Group

Susan Hildreth, Distinguished Practitioner in Residence, University of Washington

Misty Jones, Director, San Diego Public Library

Sarah Houghton, Director, San Rafael Public Library

Susan Broman, Director of Emerging Technologies and Collections, Los Angeles Public Library

Work is underway to bring high-speed broadband to all of California's public libraries by connecting them to CalREN, the high-capacity, 3,800-mile fiber optic network operated by CENIC. The Califa Group, a non-profit library consortium, has been engaged by the California State Library to manage the rollout process with CENIC. After two years of implementation, 129 out of 176 of the eligible library jurisdictions in the state are either connected or in the process of connecting to CalREN, most at gigabit speeds. Because libraries are central to their communities, connecting them to CalREN will effectively provide all of California's residents with high-performance access to the myriad resources that constitute 21st-century digital citizenship, and will provide California with all of the economic benefits of a digitally empowered population.

The panelists will provide insights into new applications that have been enabled by their increased bandwidth connections to CalREN, new partnerships that have been similarly enabled, and aspirations for future innovations to serve libraries and library patrons. For example, the Governor's 2018 budget highlights the role of libraries in California's workforce development, and the panelists will discuss their work in this area—both existing programming and future plans. For prospective library participants in CENIC, the panelists will provide an overview about the process of joining the CENIC project.

LOCATION: La Jolla Ballroom

Why Diversity And Inclusion Should Be A Top Priority For 2017

2:00-2:45 pm, Monday, March 20, 2017

Moderator: Marla Meehl, Manager, UCAR & PI on (WINS) project

Lucy Sanders, CEO, and Co-Founder, NCWIT

Robin Hauser, Director and Producer, Finish Line Features, LLC and Unleashed Productions, Inc.

Sana Bellamine, Core Engineer, CENIC

Julia Staats, Associate Core Engineer, CENIC

New research warns that at the rate we're going, the number of women in the computing workforce will decline to 22% from 24% by 2025 if nothing is done to encourage more of women to study computer science. Why should you and your organization care? Research has revealed multiple benefits of workplace diversity. Non-homogenous teams are simply smarter and more likely to experiment and innovate. It is also expected that there will be 1.1 million U.S. computing-related job openings by 2024 and only 41% could be filled by U.S. computing bachelor's degree recipients. We need to increase the depth and breadth of the pool and tapping women, who make up over 50% of the population, though providing only 22% of the IT workforce, is an important way to do this. Listen and interact with a panel of women experts and professionals in the field who will discuss the reasons for this discrepancy and exciting projects that are designed to understand and address the problem.

LOCATION: La Jolla Ballroom

Transition from ballroom to breakouts

2:45 – 3:00 pm

Expansion of the High-Performance Wireless Research and Education Network

3:00 – 3:30 pm, Monday, March 20, 2017

Dr. Frank Vernon, Director of HPWREN,
Scripps Institution of Oceanography, UCSD

San Diego County's High-Performance Wireless Research and Education Network (HPWREN) is now expanding into Orange County. The network enables research, education, and public safety by providing wireless communications support for cameras, weather stations, and sensors in the field using a microwave-based network spanning San Diego County. A significant number of seismic sensors are also supported. HPWREN sensor and camera data are published in near real time at publicly accessible websites. HPWREN also brings Internet access to the field in support of more than sixty back-country Forest Service, CalFire, and community fire stations. From fire suppression to earthquake warning systems, researchers and the general public benefit from this expanding network. Initially funded by the NSF, HPWREN has been built out from the San Diego Supercomputer Center at UCSD since 2000. This presentation will be an overview of the existing HPWREN infrastructure and its expansion into Orange County.

LOCATION: Pacifica A

FIONA + PRISM = Worldwide Access to the Unidata Internet Data Distribution (IDD)

3:30 – 4:00 pm, Monday, March 20, 2017

Tom DeFanti, Senior Research Scientist, Qualcomm Institute, UCSD

John Graham, Research Engineer, Qualcomm Institute, UCSD

To make data available to researchers worldwide and improve collaboration with the Unidata community, UC San Diego received NSF funding to install a Flash I/O Network Appliance (FIONA)-based AWIPS2/EDEX server on the 40 Gbps PRISM Network. Building the equipment at low cost and integrating it into ultra-high-speed networks has enhanced collaborative research and access to data. Learn about one of the most exciting recent developments: the availability of Jupyter Notebooks. These python-based notebooks are hosted in a web-based multi-user platform with a local 5,000-core Nvidia K80 GPGPU for machine vision and deep learning frameworks, greatly simplifying the sharing of research and eliminating the need to install special software.

LOCATION: Pacifica A

Pacific Research Platform Meeting

3:00 – 5:00 pm, Monday, March 20, 2017

Michael Cianfrocco, Postdoctoral Fellow, UC San Diego

Elizabeth Villa, Assistant Professor of Chemistry and Biochemistry, UC San Diego

Frank Vernon, Research Geophysicist & Lecturer, Scripps Institution of Oceanography, UC San Diego

Camille Crittenden, Deputy Director, Center for Information Technology Research in the Interest of Society (CITRIS) and the Banatao Institute, UC Berkeley (moderator)

The NSF-funded Pacific Research Platform (PRP) is a science-driven high-capacity data-centric "freeway system" being developed on a large regional scale. The PRP will enable participating universities and other research institutions to move data 1,000 times faster compared to speeds on today's inter-campus shared Internet. This workshop will highlight early progress on facilitating collaborative, data-intensive research with case studies on use of the PRP for Cryo-EM and real-time wildfire detection and response.

LOCATION: Pacifica B

Innovations in High-Speed Encryption Solutions for 100 Gbps and Beyond

3:00 – 3:30 pm, Monday, March 20, 2017

Craig Hill, Distinguished Systems Engineer, U.S. Federal Area, Cisco Systems

Demand for increased bandwidth continues, driven by cloud services, mobile devices, and massive increases in video traffic. While Ethernet and optical have now emerged as de facto standards, with speeds growing from 10-Gb, to 40-Gb, and now to 100-Gb, these new high-speed transport rates have created enormous challenges in encrypting and securing traffic inline. This discussion will focus on how Ethernet link encryption (MACsec – IEEE 802.1AE) can be leveraged in the WAN to support encryption rates that are aligned with link speeds at 10/40/100G and beyond, and are directly integrated in router interfaces. Topics will include a brief description of MACsec, the implications of Carrier Ethernet transport options, and innovations and enhancements made to MACsec to allow it to run efficiently over the WAN. Finally, this session will describe a series of common use cases in which WAN MACsec is being leveraged and deployed, look at how MACsec compares with IPSec, and discuss how these solutions can be leveraged together in today's network WAN and Metro Ethernet designs.

LOCATION: Learning Center

Hybrid IT infrastructures and Cloud-based Network Performance

3:30 – 4:00 pm, Monday, March 20, 2017

Pulak Chowdhury, Founder and Architect of Ennetix, Inc.

Partha Bhaumik, Senior R&D Engineer at Ennetix, Inc.

Biswanath Mukherjee, Founder and President of Ennetix, Inc.

Ennetix is a startup company funded by the Department of Energy's Small Business Innovation Research program. The company has developed a cloud-based Network Description: Performance Management (NPM) service, designed for hybrid IT infrastructures and distributed networks. By combining active measurements and passive data gathering (flow data, traffic stats from network elements, logs), the service allows network administrators to gain greater visibility into network path performance at a granular level. Users can receive notifications when performance issues occur, accelerate troubleshooting, and engage in proactive network performance management. The presentation will focus on the benefits of this system for those who run hybrid cloud environments.

LOCATION: Learning Center

Cisco Umbrella – Cisco's Secure Internet Gateway

4:00 – 4:30 pm, Monday, March 20, 2017

Austin Bates, Regional Sales Manager SLED at OpenDNS

Cisco's Umbrella provides the first line of defense against threats on the internet. Because Umbrella is delivered from the cloud, it is the easiest way to protect all of your users in minutes. Threats continue to increase in sophistication but attackers often reuse the same infrastructure in multiple attacks — leaving cyber fingerprints. Learn about how to use those fingerprints to uncover attacks before they launch in this presentation.

LOCATION: Pacifica A

The Internet of Things (IoT): Security Considerations for the Mobility Powered Campus

4:00 – 4:30 pm, Monday, March 20, 2017

Gerri Hinkel, Senior Vertical Marketing Manager for Primary and Higher Education, Aruba, a Hewlett Packard Enterprise Company

It's getting exponentially more difficult to keep up with the number of IoT devices being deployed on campuses. While these devices can introduce benefits in efficiency, cost-savings and enhanced instruction, they can introduce challenges for IT departments including maintaining network performance and ensuring security. This session will provide a checklist of considerations for smoothing the deployment of IoT devices while ensuring that network infrastructure remains secure. Drawing from real-world deployment scenarios to review the importance of device profiling, comprehensive policy management and timely reporting, attendees will come away with a broader understanding of steps campus leaders can take to ensure successful deployment.

LOCATION: Learning Center

Day Two • Tuesday, March 21, 2017

Research and Education — A View from the Private Sector Industry Panel

8:30 – 9:15 am, Tuesday, March 21, 2017

Chris Roy, Vice President, Government and Education Solutions - West, AT&T

David Nelson, President and CEO, VAST Networks

David Young, Vice President, Sales - Federal Market Group, Level 3

Arturo Iglesias, Chief Technology Officer, Transtelco

In order to serve its many constituents, CENIC works with hundreds of private sector organizations, many of whom are located in California, to operate production and leading-edge research and education networks. As a result, CENIC contributes tens of millions of dollars every year to the California economy, creating jobs and economic development across the state. Leaders from four private sector organizations will discuss, from their private sector vantage point, the evolution of their organizations, how they currently intersect with CENIC and its members, and opportunities for collaboration and innovation in the future.

LOCATION: La Jolla Ballroom

Building a Community of Researchers in Cognitive Hardware and Software on the Pacific Research Platform

9:30 – 10:00 am, Tuesday, March 21, 2017

Larry Smarr, Founding Director, California Institute for Telecommunications and Information Technology (Calit2), UCSD

Tom DeFanti, Senior Research Scientist, Qualcomm Institute, UCSD

Ilkay Altintas, Director, Center of Excellence in Workflows for Data Science, San Diego Supercomputer Center

Ken Kreutz-Delgado, Professor of Electrical and Computer Engineering, UCSD

Tajana Rosing, Professor of Computer Science and Engineering, UCSD

Javier Girado, Research Engineer, Calit2, UCSD

John Graham, Research Engineer, Qualcomm Institute, UCSD

UCSD is leading a major multi-campus infrastructure effort to facilitate researcher access to advanced computation for the training of cognitive hardware (e.g., neural network chips) and software via scalable workflows. Training for these chips will be carried out on distributed Linux nodes that include multiple 32-bit graphics processor units (GPUs), on very high-speed networks (10–100 Gigabits/s). The goal of this effort is to facilitate the quick migration of cognitive computing researchers from multi-core CPUs to GPUs and chip-based novel architectures. Providing such access will accelerate progress in research areas such as pattern recognition, neural networking, deep learning, NvN processors, power measurement, workflow architectures, machine learning, mobile robotics, and drone research.

LOCATION: Pacifica A

Protecting Scientific Data and Intellectual Property on the Pacific Research Platform

10:00 – 10:30 am, Tuesday, March 21, 2017

Tom DeFanti, Senior Research Scientist, Calit2, UCSD

John Graham, Research Engineer, Qualcomm Institute, UCSD

Phil Papadopoulos, Program Director, UC Computing Systems Qualcomm Institute, UCSD

Larry Smarr, Founding Director, California Institute for Telecommunications and Information Technology (Calit2), UCSD

Over the past two years, UC San Diego's Calit2 and UC Berkeley's CITRIS have built the Pacific Research Platform (PRP) on the CENIC network. The PRP is a re-engineering of the way big data flows between twenty campuses and national laboratories, achieving speed increases of 100-1000 times by adopting ESnet's FasterData strategy. With increased speed and performance, however, has come the need to better protect the PRP's scientific data and intellectual property. In this session, some of the world's leading researchers will discuss how to ensure that loaded software to support data movement on a DTN is uncorrupted and correctly configured, and what practices and measurements must be in place to ensure that data residing on a DTN remains valid. They will also share their strategies to accommodate multiple layers of policy and organizational differences among the campuses.

LOCATION: Pacifica A

AT&T: The Right Connection: Domain 2.0

9:30 – 10:00 am, Tuesday, March 21, 2017

Mike Keenan, Technical Sales Manager AT&T

The next major revolution in networking is underway: Software Defined Networking (SDN) and Network Function Virtualization (NFV) are rapidly gaining traction in Enterprise IT architecture, creating fundamental changes in the way organizations deploy and manage their infrastructure. These technologies allow customer-initiated, on-demand bandwidth allocation changes and rapid deployment of network functions like routing, firewalling, WAN acceleration, and intrusion detection without major capital outlay for traditional hardware-based solutions and their associated maintenance contracts. By moving networking functions to a virtualized environment, enterprises are able to focus more of their time on being service providers and less time, money, and staffing on being asset managers. Please join Mike Keenan from AT&T to find out more about how SDN and NFV are transforming the network landscape.

LOCATION: Pacifica B

Juniper: A Technology Vision for Education, Digital Cohesion

10:00 – 10:30 am, Tuesday, March 21, 2017

David Head, Senior Director, Marketing, Executive Content Strategy

A Technology Vision for Education – Digital Cohesion Throughout history, people have had to adapt to technology, and over time technology has evolved into many separate applications and experiences, which are continuously maintained and strung together into a generic experience by the user (or the teacher).

Digital Cohesion is a vision of the world in which applications combine to form mega-services that automatically and continually adapt to the way an individual behaves. Educational mega-services will operate in the background providing rich and rewarding experiential learning that augments the classroom. It is a human-centered era, where technology fades into the background, enabling services that are not only highly tailored to the student but can also adapt to their behaviours becoming so customised and predictive, that it feels magical. The technical barriers to this era are not insurmountable and should not deter, but motivate us to bring about this world where technology further disappears into the fabric of education.

LOCATION: Pacifica B

Points of Failure: A Network Reinforcement Problem Solved

9:30 -10:00 am, Tuesday, March 21, 2017

Dr. Olivier Goldschmidt, Network & Telecommunications Architect, Riverside County Office of Education

Most networks within unified school districts or county offices of education have several points of failure—a link or node whose disruption disconnects a section of the network. This problem plagues many educational institutions, and can be solved by creating a set of additional links, of minimum total cost, which render the network biconnected. This interactive session, will explore techniques to solve this notoriously difficult network reinforcement problem, and describe practical examples of optimal resolution.

LOCATION: Learning Center

Congratulations, You're Connected to CalREN. Now What?

10:00 am – 11:00 am, Tuesday, March 21, 2017

Jarrid Keller, Assistant Director-Infrastructure, Sacramento Public Library

Stephanie Beverage, Director, Huntington Beach Public Library

California's public libraries are the newest addition to CalREN. Historically, California libraries have labored to provide online services to their patrons. Now that bandwidth is no longer a limitation, libraries have the opportunity to think in new ways about the online services they offer to their communities. There are many possibilities and options, but where is the best place to start? Join library leaders Jarrid Keller and Stephanie Beverage to discuss what programs and services libraries are offering now that they have connected to CalREN, and to share your ideas.

LOCATION: Learning Center

The Art of Maintaining a Microwave-Based Internet Link Across an Ever-Changing City Skyline

10:30 – 11:00 am, Tuesday, March 21, 2017

Robert Kibrick, Research Astronomer, University of California Observatories

The University of California's Lick Observatory and Blue Oak Ranch Reserve are connected to CalREN, via the Sunnyvale Hub, by a high-speed microwave-based link deployed in 2012. This connection provides remote access to scientific instruments, associated telemetry, and data archives. The Silicon Valley skyline has changed dramatically over the last four years, and will continue to change in the future. Presenters will describe criteria for site selection and strategies used to keep links operating through construction and ever-changing conditions. They will also discuss how partnership with a CENIC K-12 member enabled a successful move to a new site. The use of microwave to connect these remote facilities was first discussed at the 2008 CENIC conference, when the project was in early-stage development.

LOCATION: Pacifica A

Awards Ceremony & Luncheon

11:30 am – 1:00 pm, March 21, 2017

Innovations in Networking Awards

- Outstanding Individual Contributions
- Educational Applications
- Research Applications
- Broadband Applications
- Corporate Partner
- Experimental Applications

CENIC Founders Award

CENIC Founders Circle Awards

LOCATION: La Jolla Ballroom

Shuttles to Calit2

1:15 – 1:45 pm

Meet buses in front entrance of Estancia.

Catalyst CAVEkiosk: Sharing Cultural Heritage Data over the Pacific Research Platform

2:00 – 3:00 pm, Tuesday, March 21, 2017

Professor Thomas E. Levy, Department of Anthropology, Center for Cyber-Archaeology and Sustainability, Qualcomm Institute, UCSD

Jurgen Schulze, Adjunct Professor and Research Scientist, Qualcomm Institute, UCSD

Archaeological sites in countries such as Egypt, Turkey, Jordan, Israel, Greece, Morocco, and Cyprus can now be visited virtually using the CAVEkiosk, the first large-scale 3D immersive environment designed expressly for public engagement. Immersive Virtual Reality (VR) for the public has been a challenge since the early days of the motion picture industry. CAVEkiosk allows members of campus communities and the public to experience at-risk cultural heritage sites first-hand from libraries, museums, and other public places. In addition to hosting large cultural heritage digital data assets from the Research Data Curation program at the UC San Diego Geisel Library, CAVEkiosk is being used to experiment with moving big data across the Pacific Research Platform (PRP), an optical fiber network. This presentation will address real-time sharing in VR of digital archaeology data collected by UC San Diego and UC Merced researchers in the eastern Mediterranean region in 2016.

LOCATION: Auditorium & Black Box Theatre

Earth Science Knowledge Discovery

3:00 – 3:30 pm, Tuesday, March 21, 2017

Brian Kawzenuk, Hydrometeorological Research Analyst, The Center for Western Weather and Water Extremes, at UCSD's Scripps Institution of Oceanography

Thomas A. DeFanti, Senior Research Scientist, Calit2, UCSD

Scott L. Sellars, Postdoctoral Scholar in The Center for Western Weather and Water Extremes (CW3E) at UCSD's Scripps Institution of Oceanography

Phu Nguyen, Assistant Adjunct Professor, Civil and Environmental Engineering, University of California, Irvine

John Graham, Research Engineer, Qualcomm Institute, UCSD

Larry Smarr, Founding Director, California Institute for Telecommunications and Information Technology (Calit2), UCSD

With the availability of ever-increasing amounts of observational data, enhanced computational capabilities, and innovative computational approaches, a new era in computational earth sciences is within our grasp. These approaches enable the assimilation, analysis, and modeling of complex earth science phenomena. In this session, researchers will report on the development of multi-institutional rapid data access capabilities, and describe a data pipeline for applying a novel image characterization and segmentation. They will also discuss their development of the CONNected objECT (CONNECT) algorithm to study "Atmospheric Rivers" events impacting the Western United States—events often associated with torrential rains, swollen rivers, flash flooding, and mudslides.

LOCATION: Auditorium

Moving Your Infrastructure to a Dark Fiber Environment

3:00 – 3:30 pm, Tuesday, March 21, 2017

Dan Stoll, SVP Dark Fiber Solutions West Region, Zayo Group,
AJ Moul - Southern California Market Director, Zayo Group
Paul Onushko, Director, K-12 & Education, Ciena

BLACK Box Theatre

Exchanges from the Stage

3:30 – 4:30 pm, Tuesday, March 21, 2017

Mount Allen, Director of Operations, SFJAZZ
Stephanie Couch, Executive Director, Lemelson-MIT Program
Milos Liska, Senior Engineer, UltraGrid

Jazz is not only America's indigenous art form, but also a fundamental metaphor for creativity, innovation, democracy, and collaboration. Exchanges from the Stage highlights these attributes, describing an interactive experience between selected school sites and the performance stages at SFJAZZ. As part of the SFJAZZ School Day Performance Series, SFJAZZ presented a school-time matinee performance to a local student audience. At the same time, a select group of California public schools participated remotely, using their connection to CalREN. The presentation will review the performance, and describe an underlying objective of the initiative: to establish a usage protocol in support of virtual education collaborations and cultural exchange.
LOCATION: Auditorium & Black Box Theatre

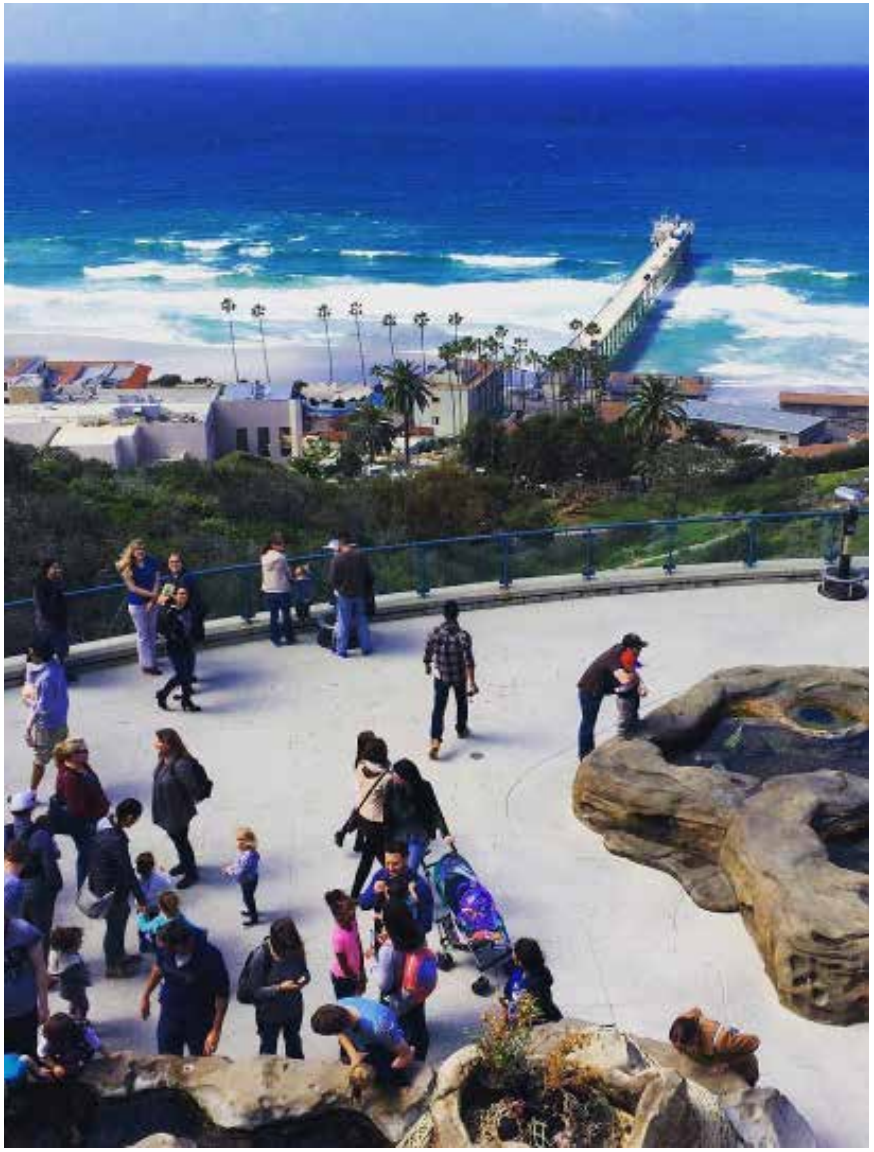
K–12 Fireside Chat

4:30 – 5:00 pm & 4:30 – 5:00 pm: Tours/labs

LOCATION: Black Box Theatre

Reception at Birch Aquarium

5:30-7:30 pm | Meet buses outside Atkinson Hall.



Cybersecurity: New Directions for Research and Education

8:30 – 9:45 am, Wednesday, March 22, 2017

Moderator: Sean Peisert, Chief Cybersecurity Strategist, CENIC

Greg Bell, CEO, Corelight

Anita Nikolich, Program Director for Cybersecurity, Division of Advanced Cyberinfrastructure, National Science Foundation

Von Welch, Director, Center for Applied Cybersecurity Research (CACR), Indiana University

Your own safety is at stake when your neighbor's wall is ablaze
- Horace

The 1988 Internet Worm, infecting thousands of computer systems in the early days of the Internet, was the first event showing computer operators that being connected to the Internet carried significant security downsides. Nearly 30 years later, we are still fighting not only Internet malware, but 1.2-Terabit per second denial-of-service attacks—attacks that can be generated by Internet-connected baby monitors. As with public health, we're in this together, and have a responsibility as a community to help address security problems.

This panel will look at how we arrived at this point, and discuss changes in security practices and technology that might help us get out, the role of the CENIC WAN in improving security, and the responsibilities of the research, education, and government constituents connected by CENIC.
LOCATION: Auditorium & Black Box Theatre

NSRC - CENIC Fellows Presentation

10:00 – 11:00 am, Wednesday, March 22, 2017

Kennedy Aseda, Lead Network Engineer, KENET (Kenya)

John Peterson, Assistant Vice President of Research, University of Guam

Steven Huter, Director, Network Startup Resource Center, University of Oregon

The Network Startup Resource Center and CENIC jointly sponsored two international research network leaders to participate and present at the 2017 Annual Summit. Travel, lodging and conference costs were covered in an effort to involve new communities with the CENIC Annual Meeting.

Kennedy Aseda, representing KENET, the National Research and Education Network of Kenya, will discuss Kenya's ambitious and advanced research infrastructure which serves public and private universities, university colleges, tertiary colleges, research institutions, and government institutions. He will also talk about initiatives to expand the reach of KENET, at home and abroad, particularly where the CENIC and KENET communities intersect.

John Peterson, representing the University of Guam, is the Co-PI of the University of Guam's NSF EPSCoR grant, and will provide an overview of UoG's ambitious research agenda and developments, many of which will soon be dependent upon on high-speed Trans-Pacific Research and Education Network capacities.

Steven Huter, representing the NSRC and the NRSC-CENIC Fellowship Program, will talk about ways that CENIC members can get involved with the NSRC's efforts around the globe.
LOCATION: Black Box Theatre

Incidents Happen! Management in a BYOD Environment

10:00 – 11:00 am, Wednesday, March 22, 2017

Robert D. Goodwin, Jr., Director, Cybersecurity, Naval Postgraduate School

Joseph LoPiccolo, Chief Information Officer, Naval Postgraduate School

More and more users are bringing their own devices into education and research organizations, presenting complex challenges to network security. In this highly interactive session, participants will learn about the process for incident response and documentation developed by the Naval Postgraduate School (NPS). Attendees will learn how the art firewall (PA-7050) and SIEM (AlienVault) have vastly improved the NPS's ability to detect and respond to malicious activity. Presenters will also discuss how Atlassian templates support the incident response process, and how gaining situational awareness helps NPS defend the ERN network in near real time.

LOCATION: Auditorium

New Threats, New Approaches in Modern Data Centers

11:00 am – 12:00 pm, Wednesday, March 22, 2017

Edgar Mendoza, IT Specialist, Information Technology and Communications Services (ITACS), Naval Postgraduate School

Eldor Magat,Computer Specialist, ITACS, Naval Postgraduate School

Mike Monahan, Network Engineer, ITACS, Naval Postgraduate School

Iben Rodriguez, BROCADE Contractor, Consult, ITACS, Naval Postgraduate School

Brian Recore, NSX Systems Engineer, VMware, Inc.

The standard approach to securing data centers has historically emphasized strong perimeter protection to keep threats on the outside of the network. However, this model is ineffective for handling new types of threats—including advanced persistent threats, insider threats, and coordinated attacks. A better model for data center security is needed: one that assumes threats can be anywhere and probably are everywhere and then, through automation, acts accordingly. Using micro-segmentation, fine-grained network controls enable unit-level trust, and flexible security policies can be applied all the way down to a network interface. In this joint presentation between customer, partner, and Vmware, the fundamental tenants of micro-segmentation will be discussed. Presenters will describe how the Naval Postgraduate School has incorporated these principles into the architecture and design of a multi-tenant Cybersecurity Lab environment to deliver security training to national and international government personnel.

LOCATION: Black Box Theatre

Evolution of the California Department of Technology

11:00 am – 11:30 am, Wednesday, March 22, 2017

Christopher Cruz, Chief Deputy Director, Deputy State CIO

Learn more about the California Department of Technology (CDT). CDTs shared service delivery model provides highly-available, cost effective and secure infrastructure and platform services to our customers. The protection of these IT assets is our top priority. CDT continues to evolve and mature its security posture through the establishment of a Security Operations Center that will partner with the California Cyber Security Integration Center.

LOCATION: Auditorium

Conference Adjourns

12:00 pm, Wednesday, March 22, 2017

CENIC Technical Advisory Councils Meeting

12:30-3:30 pm, Wednesday, March 22, 2017

The Technical Advisory Councils (TAC) are comprised of interested individuals who want to participate in the planning and design of CENIC networks and technologies. TACs provide advice on technology, including recommendations on hardware, software, interoperability issues, performance management, and network research priorities. The Technical Advisory Councils have a joint meeting at the annual conference and are open to interested individuals.

LOCATION: Atkinson Hall, UCSD

CENIC REPORT TO THE COMMUNITY | SPRING 2017

CENIC and its 11,000 member organizations in the education and research communities in California continually look for ways to strengthen, secure, and expand the CalREN network.

Over 20,000,000 Californians use this high-capacity broadband network which allows them to communicate, collaborate, teach, and conduct research in ways that were unimaginable when CENIC was founded 20 years ago.

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This report describes recent improvements and innovations including:

- **Major upgrades to connectivity within specific segments**
- **Enhancements to the network backbone**
- **CENIC's cybersecurity initiative**
- **New communities, including city governments and public libraries, connect to the network**
- **Innovative uses of the network within and across segments**

View the Report > www.cenic.org/files/publications/2017report

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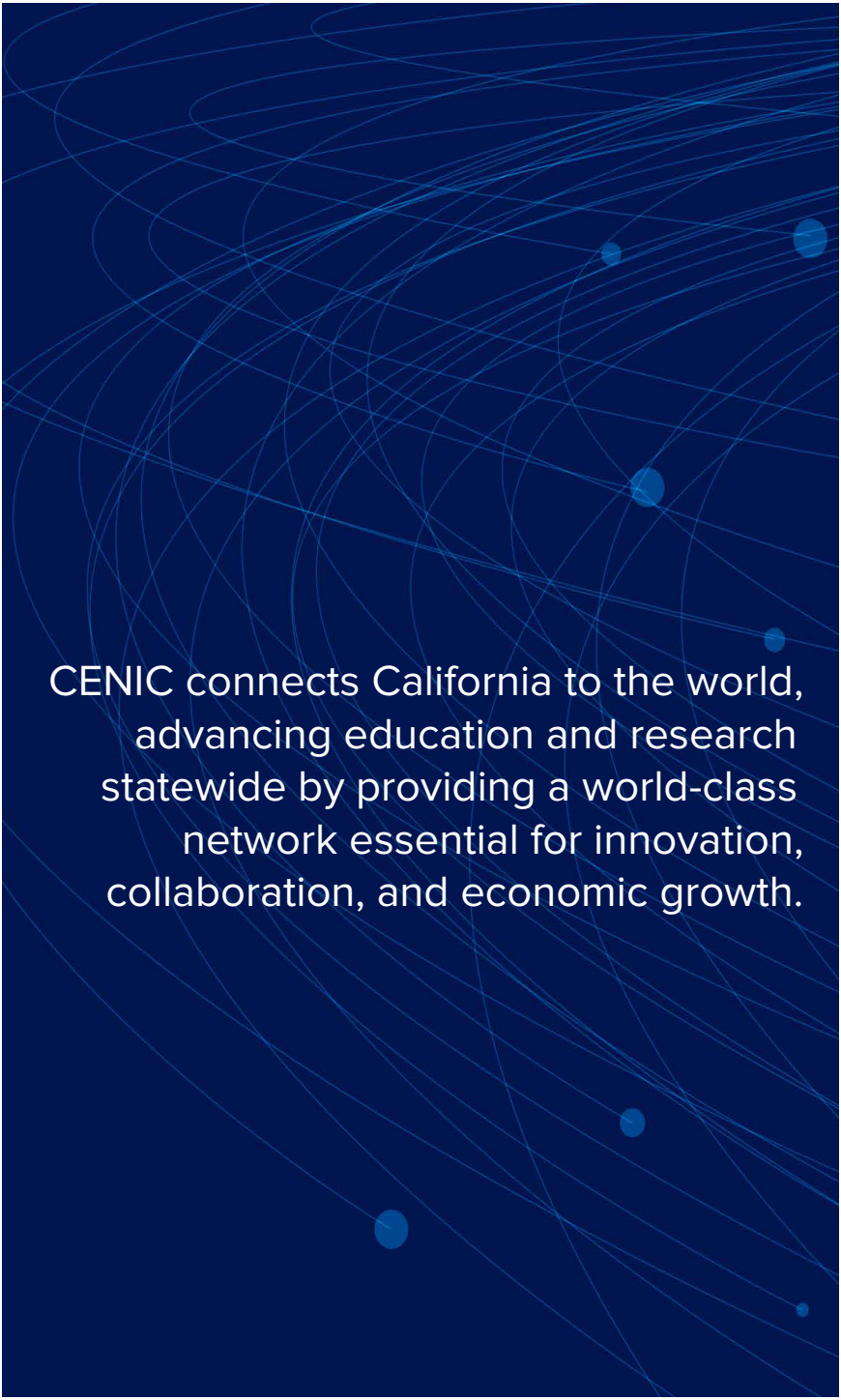
CENIC connects California to the world,
advancing education and research
statewide by providing a world-class
network essential for innovation,
collaboration, and economic growth.