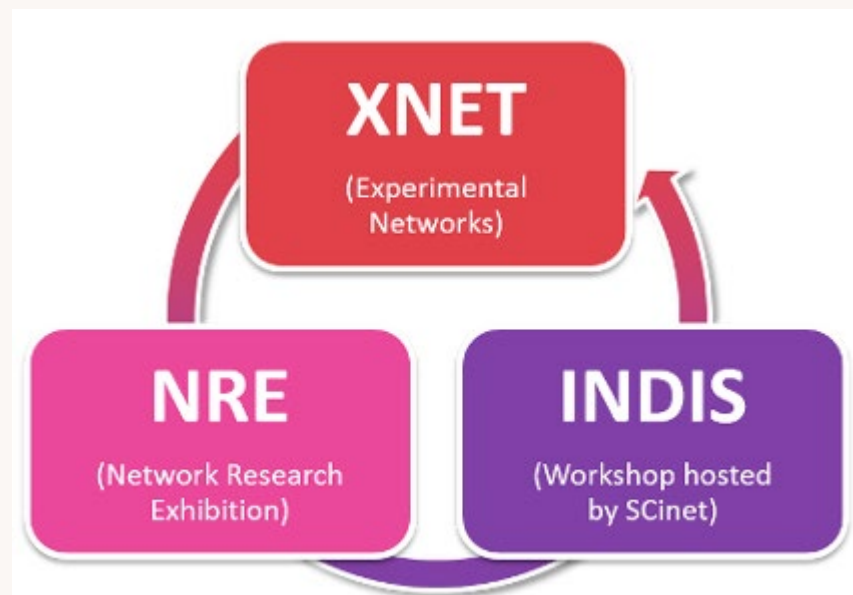SCinet Future Research Perspectives
Ezra Kissel

SC21 INDIS Workshop
11/15 • St. Louis, MO, USA

A tradition of experimentation

https://scinet.supercomputing.org/community/indis/about-indis/

- SCinet showcases emerging, often pre-commercial, developmental networking technologies
  - Protocols, applications, and services
- Data-intensive networking research

DWDM

OC-48 SONET

10G Ethernet

Infiniband

GMPLS

RDMA

Orchestration

Migration

DTNs

NDN

SDN

400G Ethernet

Status of NRE and XNet in 2021

- We continue to adjust in an era of COVID uncertainty

- 18 NRE demos accepted
  - Self-driving, reconfigurable networks and orchestration frameworks
  - Terabit WAN services
  - Testbed integration
  - Named Data Networking
  - Telemetry

- Experimental Networks
  - New team leads bringing fresh perspectives
  - Panel formed to discuss ongoing activity and future directions (INDIS later today)

Future SCinet opportunities

- Many conversations around flexible services (DTNs, processing, job scheduling, etc.) alongside a cutting-edge network

- SCinet providing a more general platform for researchers
  - Advanced networking with embedded storage and compute
  - Presence beyond November timeframe

- Preparing for the demands of ongoing and emerging research areas
  - AI/ML, 5G/6G, Quantum, Distributed Data Management

- Improving integration with national and international testbeds and networks

FABRIC

NEA³R
NETWORKS FOR
EUROPEAN, AMERICAN, AFRICAN,
& ARCTIC RESEARCH

BRIDGES

PACIFIC WAVE

COSMOS

STARLIGHT SDX

Closing thoughts

- Dealing with complexity → moving up the abstraction hierarchy
  - Orchestration and software-defined control
  - Emerging self-driving and automated systems
  - Addressing the expertise gap!

- Issues extends across the computing and networking landscape
  - Scientific software, data, cyber-infrastructure, platforms and workflows

- What can SCinet explore in the next 5-10 years?
  - Provide an amount of persistent, integrated infrastructure for experimentation
  - Support technical challenges and adoption of new capabilities
  - Continue improving visibility to a broader community
  - Encourage new volunteers to take on big ideas
  - Embrace hybrid formats

END

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