

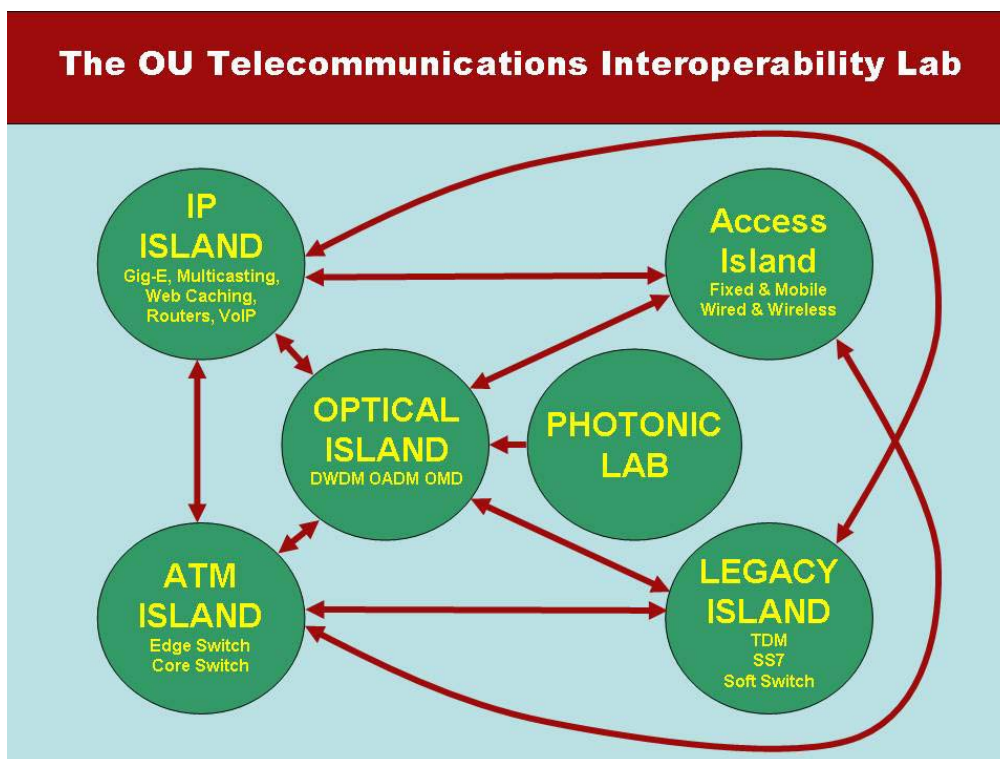
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The OU-Tulsa Telecommunications Interoperability Lab

The mission of the Interoperability Lab is to build flexible and interconnected nodal configurations consisting of multi-vendor ATM, IP, TDM, SDH, and DWDM equipment including fixed and mobile access points. It allows the user to systematically assess the impact of nodal and access configurations and hardware/software elements on users.

The Lab design is based on a five-island configuration: Internet Protocol (IP), Asynchronous Transfer Mode (ATM), Legacy, Optical Networking and Wireless. These networking islands encompass all the possible base telecommunications technologies and include a Photonic Lab in which students, faculty, equipment manufacturers, and network operators can reliably test new theories and methodologies without impacting production networks and facilities. Within the lab, we are developing base methodologies for testing between heterogeneous networks, network application testing and configuration, plus a myriad of other design and security related projects.



Interoperability Lab Islands

- **IP-Island – Cabletron, Cisco, Enterasys, Foundry**
 - GigE (SM, MM)
 - 100BaseT
 - 10BaseT
 - R11 (Telephone set)
- **ATM-Island – Cabletron, Cisco, Riverstone, Stratacom**
 - ATM OC3 (MM)
 - ATM DS1, DS-3
 - Frame Relay DS1
 - Circuit Emulation DS1
- **Interconnection**
 - Optical (MM, SM)
 - Wired (CAT5, CAT5E, CAT6)
- **Legacy Island –Lucent, Nortel**
 - Nortel DMS-10
 - Nortel Meridian PBX
 - Carrier Access TDM
- **Optics-Island – Ciena K2, Lucent WaveStar OLS-40G, DACSII, Nortel OC192**
 - Optical DWDM Link Simulators
 - Optical DWDM Net Simulators
 - DS0, DS1, DS3, OC3 (SM, MM), OC12 (SM), OC48 (SM), OC192 (SM, OLS), NextGen SONET/SDH, Gig-E, 10Gig-E
- **Photonics Lab**
 - Component Level Research
- **Wireless-Island –Cisco, TeraBeam**
 - GigE (FSO)
 - OC3 (FSO),
 - 802.11x

Major Research Capabilities and Instruments

Voice-over-Internet Protocol (VoIP)

Research Goals and Objectives

Interoperability testing of VoIP protocols and equipment

Develop

- Applications over VoIP

Evaluate

- CODEC Performance
- Networks and Protocols
- QoS, NAT implications

Test

- VoIP over wireless
- Traffic volume impacts

Legacy Time Division Switches

Research Goals and Objectives

Interoperability testing of emerging technologies in an embedded base environment

Develop

- Test techniques

Evaluate

- Evaluate SS7 capabilities

Test

- Interoperability

Optical Test Bed

Research Goals and Objectives

Net dynamic traffic balancing and reconfiguration

Net protection (link, node, service)

Physical layer studies and security

Fault management (link, node, service)

Network topologies

Develop

- Mesh Ring topologies
- Integrate with FSO and wireless

Evaluate

- Traffic, switching, protection

Test

- Efficiency and performance

Photonics Area

Research Goals and Objectives

Photonic devices, components, and sub-systems for optical communications and information processing.

Develop

- Free-space optical communications
- Advanced display technologies, analog fiber optics for avionics applications, and optical security techniques.

Evaluate

- Effects of optical interference on free-space optical communications
- Suitability of wavelength-division-multiplexing techniques for high-bandwidth analog signal transmission.

Test

- RF & optical spectrum analysis; optical polarization analysis; optical power measurements; waveform analysis.