An Introduction to the UNH InterOperability Lab

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UNH InterOperability Lab

Overview

- Purpose and Mission
- Organization and Structure
- The Activities of the IOL
- Vision for the Future
- Challenges
- Conclusion

Purpose and Mission

- The IOL has two mission components, one internal and one external
- Internal Component - To foster excellence in UNH students in the field of computer communications.
- External Component - To improve the operation and interoperability of multivendor networks

Organization

- The IOL Organizational Philosophy
  - Lightweight
  - Cooperative
- The IOL
  - Single lab site located in Durham NH. All staff are UNH employees or UNH students
- Consortiums
  - Multiple consortiums, address different areas such as FDDI, ATM, or IP.
  - Function as independent business units

The Activities of the IOL

- Testing Services
  - multiple types of services, test many different aspects of a product from conformance to a standard to operation of a technology overall.
- Education and Research
  - Focus on aspects related to computer communications and interoperability testing
- Service
  - Technology exchange, network design

Testing Services

- Consortium Based
- One Time Group Testing Programs
- Non-consortium Based Testing Service
- Contracted Testing Service
- Specialized Alpha/Beta Testing Agreements

Types of IOL Testing

- Conformance <u>Like</u> Testing
  - parametric tests, drawn from standard
  - not all aspects of a standard are tested
- Interoperability Testing
  - testing characterized by direct device to device testing
  - operation in complex "real" networks
  - operation in reference networks

Types of IOL Testing

- Systems Testing
  - Tests operation of overall product, including user interface and documentation
  - Tests operation under load and in erred environments
- Internetwork Testing
  - Tests operation in networks where multiple technologies are used. Used where devices have multiple interfaces

"Joinable" IOL Consortiums

- Mature Consortiums
  - FDDI, NETMGT
- Fully Operational but new Consortiums
  - Token Ring, IP, FDSE
- Developing Consortiums
  - VG-ANYLAN, Fast Ethernet
- Terminated Consortiums
  - 10BASE-T (now part of ethernet test suite)

Ethernet related Testing

- Ethernet, Full Duplex Switched Ethernet, Fast Ethernet
- Interoperability test
- IEEE 802.3 Conformance test for a 10BASE-T MAU
- Repeater Testing (chapter 9), Collision tests

Token Ring

- MAC layer conformance tests
- PHY layer physical signaling tests
- JTOL, JTOLX, AJ, FAPS, DFAPS, return loss
- Concentrator tests
- Source Route Bridging
- Large Ring Testing
- Operation of Higher Layer Protocols on Token Ring Internetworks

FDDI

- Large Ring Tests
- SMT 6.2-7.3 Conformance Testing
- Higher Layer Protocol Operations on FDDI
- MAC Layer Bridge Testing

Network Management

- SNMP V1 and V2 protocol testing
- Agent MIB consistancy testing
- MIB instantiation testing
- MIB enrollment testing
- RMON testing
- Management station testing
- MIB get/set testing

VG-ANYLAN

- MAC testing
- RMAC testing

ATM

- UNI 3.0 onward
- Address registration and SSCOP
- ILMI
- LAN Emulation
- IP operation (RFC 1483 & 1577)
- PNNI
- Traffic management and QOS

Internet Protocol

- OSPF conformance testing
- OSPF interoperability testing
- RIP conformance testing
- RIP interoperability testing

Working with the IOL

- Consortium Membership
  - one annual fee from $6,000 to $10,000 depending on consortium
  - can test multiple times with different products
  - must leave representative platform at the lab for others to tests against
  - do not have to be present at lab during test

Working with the IOL

- Consortium membership
  - Flexible, the lab can be used to perform testing beyond standard test suites.
- One time testing service
  - Similar to a testing house, one time fee
  - No requirement to leave platform
- Contracted Service
  - Varies by contract, typically extended testing of an overall product

Vision for the Future

- Addressing the whole interoperability problem from layer 0 to layer 7
- Improve access to the IOL's testing tools and services
  - network based access
  - building tests using standardized tools
- Support ANSI and IEEE during early aspects of standards development
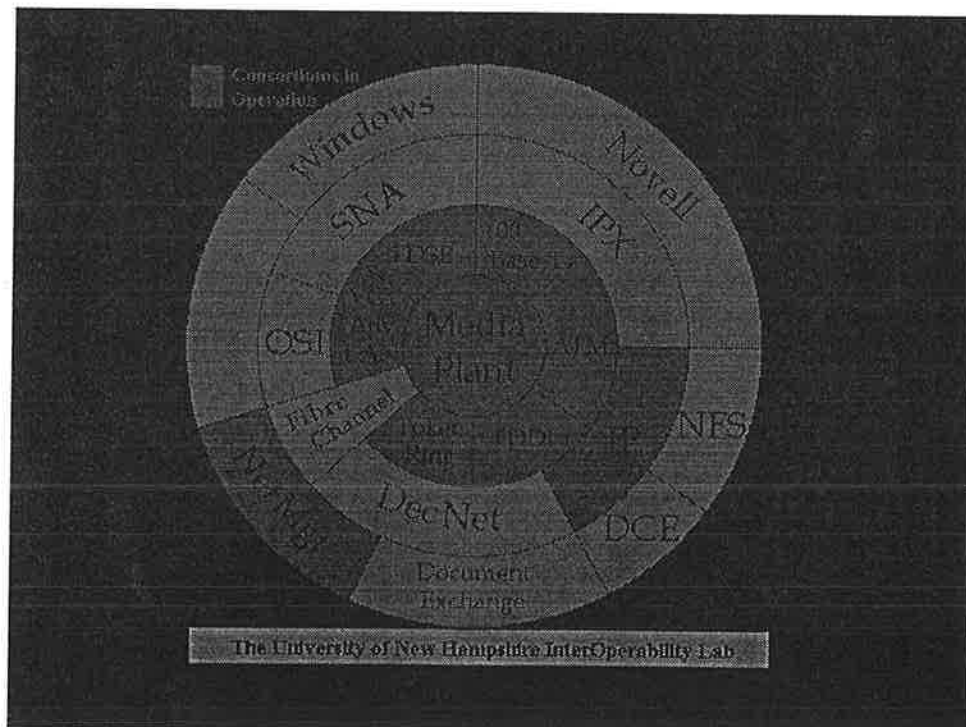
Challenges

- Meeting new expectations
  - Leadership role in the timely development of open high quality design verification testing services.
  - must be timely and accountable on a consistent basis
- Maintaining Accessibility
  - low cost, open environment for all
- Continued Cooperation
  - IOL needs financial and technical support

The IOL works because...

- Lightweight structure
  - no complex agreements
  - no lawyers
- Cooperation Vs. Confrontation
  - most companies strive for quality
- Mutual benefit to industry and academia
  - test suite development excellent vehicle for training students in computer communications.