

# DIVISION COMPUTING INFRASTRUCTURE DEVELOPMENT

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## **Networking**

The Physics Division maintains a Local Area Network (LAN) which consists of an installed plant of fiber optic and coaxial cable, a network router, a network switch and various concentrators, hubs and repeaters. There are network connections in about 143 offices and 10 laboratories that span five buildings. A Cisco Systems 4500M router is used to connect the Physics LAN to the ORNL network.

The backbone of the Physics Division network consists of fiber optic cables and Fiber Distributed Data Interface (FDDI) components interconnected to form a redundant ring with the capability of carrying 100 Million bits per second (100 Mbps). This ring spans the five buildings we network and, at five locations, provides connections for 25 high performance workstations and servers.

All offices are connected to the LAN using Ethernet coaxial cable (10Base2). Typically, eight offices share a single cable segment and the 10 million bits per second (10Mbps) bandwidth of that cable segment. Each segment is connected to a Cisco System C1212 Catalyst Switch. The switch isolates traffic and effectively increases the total bandwidth of the LAN.

Like most organizations, Physics is experiencing a demand for increased network bandwidth to the desktop. Currently, more powerful computers and network intensive applications can saturate the network. We are planning to phase in an updated wiring plant of twisted-pair cable and electronics to support 100 Mbps to every desktop.

## **Computing**

At the present time, we have a computing milieu composed of workstations, most of which use UNIX operating systems, X-terminals, which provide X-windows access to the workstations, Windows/INTEL personal computers, and Apple Macintosh and Macintosh-clone computers.

The Physics Division now operates a J90 CRAY computer. It has 16 processors capable of 100 MIPS/processor for scalar operations and 200 Mflops/processor for vector operations. Each processor has 4096 Mbytes of RAM. There are 70 Gbytes of local disk storage. This computer serves medium-level performance computing needs within the division, supplementing the resources of our eight-processor Silicon Graphics Power Challenge.

## **Networked Services**

The Physics Division provides some centralized, networked services to the workstations owned by the various groups and sections. These are file service, printing, electronic mail routing, web page service and an ftp server.

### Summary of Networked Equipment - October 1997

Workstations(UNIX and VMS)	65
X-terminals (Tektronix and Neoware)	73
Intel-based (Windows95 and NT, Linux)	133
Macintosh	68
Networked Printers	12
Terminal servers	4
Network switches and routers	9
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Total Number of networked devices	364

We have installed a Network Appliance (NetApp) file server to help satisfy the insatiable appetite for disk space. This fileserver provides redundant storage, so that the failure of any one disk does not damage the integrity of any files. Loss of significant work was becoming more and more troublesome as our systems age and the probability for disk failures was rising. The fileserver also provides very high performance network file service, much higher than any of our workstations, and simplifies our management of the networked file storage.

We operate 12 networked printers in the Physics Division complex. In general they provide lp and lpd print services for the UNIX workstations using the Transcript software package to format and dispatch print jobs. Some printers also provide LocalTalk and AppleTalk printing for Macintosh users. Two QMS Magicolor printers provide color laser printing with 600 dpi resolution. High speed laser printing (17 pages/minute) and duplex (dual sided) printing is provided by two QMS 1725 printers. A variety of HP and QMS printers are located near most work areas to provide low end (6 pages/minute) print service.

The Physics Division operates electronic mail routing handled by the UNIX sendmail application via the SMTP protocol. Most delivered mail is stored on the file server. It can be retrieved either by running an application on a participating UNIX workstation (i.e. mail, pine, mh, elm, or netscape) or via POP3 by Windows or Macintosh computers using applications such as Eudora or Netscape.

We also support information distribution via the World-Wide-Web, through the Physics Division Home page ([www.phy.ornl.gov](http://www.phy.ornl.gov)) and anonymous FTP ([ftp.phy.ornl.gov](ftp://ftp.phy.ornl.gov)). As this is being prepared we are making a transition to a new appearance for the home page designed for us by Ilesnet Design.