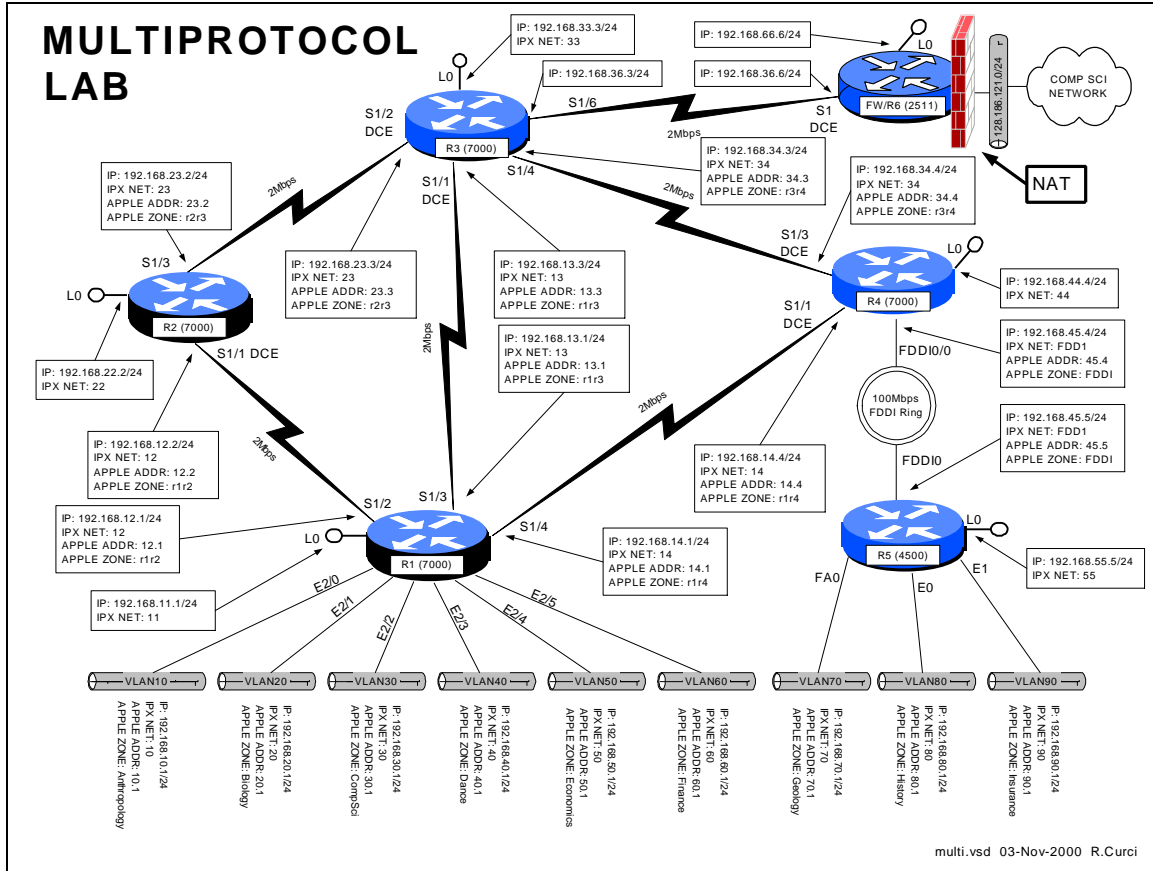


# INTERNET TEACHING LAB: MULTIPROTOCOL LAB



## Overview

This lab explores two popular non-IP protocols: Novell's IPX and Apple's Appletalk. IPX is a modified version of the Xerox XNS protocol adapted for use on Novell file servers. Today, this protocol is also supported under Windows and Linux. Appletalk was designed for use on the Apple Macintosh computer and Apple LaserWriter printers. It is supported under Linux and partly supported under Windows NT. For example, Windows NT has support to act as a native IPX file server or a native Appletalk File server (called AppleShare in Apple terminology). This allows IPX and Apple devices to access the server without the need for additional software.

## Part 1 – IPX

IPX network addresses are composed of a 32-bit network address and a 48-bit host address. The syntax is often abbreviated N.H.H.H and written in hexadecimal. Addresses can be entered in the form “NNNNNNNN.HHHH.HHHH.HHHH” but leading zeros can be omitted. IPX routing is turned on with the global router command

“ipx routing HHHH.HHHH.HHHH” where HHHH.HHHH.HHHH is a host identifier for your router. If present, this address will be used on interfaces that do not have any MAC address like serial lines. If omitted, the router will make up an address or use one from an active ethernet port. Embed your router name in the address to make things like routing table listings a little easier to read. For example, if you are programming router r4, turn on ipx with the global command “ipx routing 4.4.4”. Once the IPX routing process is running on the router, you will need to add an IPX network address to each interface you want to speak IPX. Use the interface command “ipx network NNNNNNNN” in hexadecimal. Follow the diagram above carefully to add IPX routing. The Cisco routers have an IPX PING command that is helpful to verify connectivity.

```
r5#ping
Protocol [ip]: ipx
Target IPX address: 11.1.1.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Verbose [n]:
Type escape sequence to abort.
Sending 5, 100-byte IPXcisco Echoes to 11.0001.0001.0001, timeout is 2
seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/8 ms
```

Use the following commands to help with debugging your configuration.

- show ipx route
- show ipx interface
- show ipx interface brief
- show ipx traffic
- show ipx server
- show ipx server detailed

## Part 2 – Appletalk

Appletalk Phase II addresses of a 16-bit network address and 8-bit host address. Host addresses 0, 254, and 255 are reserved, so you can only use host addresses 1 through 253 in your network. In order to provision networks supporting more than 253 hosts, you can specify a range of consecutive network addresses (called “cable-range” in Apple terminology), but it will not be necessary in this lab. Appletalk normally will dynamically select an unused host number, however, we will be specifying it manually so it will be easier to test the network with tools like PING. Appletalk also uses the concept of a “zone” to logically name the networks. A single zone name may belong to multiple network segments, and a single network segment may have multiple zones, but only a single default zone. Zone names can include whitespace and non alphanumeric characters and are case sensitive, so type them carefully.

Enable appletalk routing with global command “appletalk routing” which uses the RTMP routing protocol by default. To enable appletalk on an interface and assign a network address, enter the interface command “appletalk cable-range N-N N.H” where N is your network number and H is your host number. The cisco router also has a built-in appletalk PING command that can be used for testing as follows.

```
r5#ping
Protocol [ip]: apple
Target AppleTalk address: 10.1
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Verbose [n]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte AppleTalk Echos to 10.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/7/12 ms
```

The following commands may be helpful if debugging your configuration.

- show appletalk route
- show appletalk zone
- show appletalk interface
- show appletalk interface brief
- show appletalk adjacent-routers
- show appletalk globals
- show appletalk neighbors
- show appletalk traffic