

# Networks & Server Structures

Servers

Ports

Network Operating Systems

FTP

Remote Access



Ports  
... no not that kind, you lush.

# Port

- Application specific addresses to which packets are directed on a receiving machine
- Channel is a better name
- 0 - 65535
- 0 - 1023 - The Well Known Ports
- Port number present in header of packet

# Well Known Ports

- FTP (data) - 20
- FTP - 21
- SSH - 22
- Telnet - 23
- SMTP - 25
- DNS - 53
- DHCP - 68
- HTTP - 80
- POP3 - 110
- SFTP - 115
- IMAP - 143
- IRC - 194
- IMAP3 - 220
- SSL - 443

# Registered Ports

- Microsoft SQL Server - 1433
- Oracle SQL - 1521
- mySQL - 3306
- Yahoo Messenger - 5010
- AOL IM - 5190
- Napster - 6699
- Unreal - 7778
- HTTP - 8080
- Quake - 26000
- Half-Life - 27010
- Quake III - 27960

**This clip is for non-commercial use only**



# Servers

They've got what you want

# Servers

- A network computer that shares resources with and responds to requests from other network computers
- Any computer that performs network functions for other computers

# Servers

- Hardware
- Can be built from commodity computer components for low-load and / or non-critical applications
- Specialized hardware used for dedicated, high-load, mission-critical applications

# Servers

- Software
- Specialized operating system designed specifically for server usage
- Typically Unix or Linux
- Many servers do not use a GUI and therefore can devote more processing power to other tasks

# Server Types

- Types
- Application
- Proxy
- File
- FTP
- Email
- Networking
- Web

# Application Server

- Provide specific application services to an application
- For example, a server that runs a database that a distributed application uses

# Proxy Server

- Acts as an intermediary between a workstation user and the Internet
- Provides security, administrative control, and caching services

# File Servers

- Responsible for the central storage and management of data files so that other computers on the same network can access the files
- In corporate networks it's often called a public drive

# FTP Servers

- Allows users to transfer files over the network or Internet

# Email Servers

- Provide email storage and interconnection services to client computers

# Networking Servers

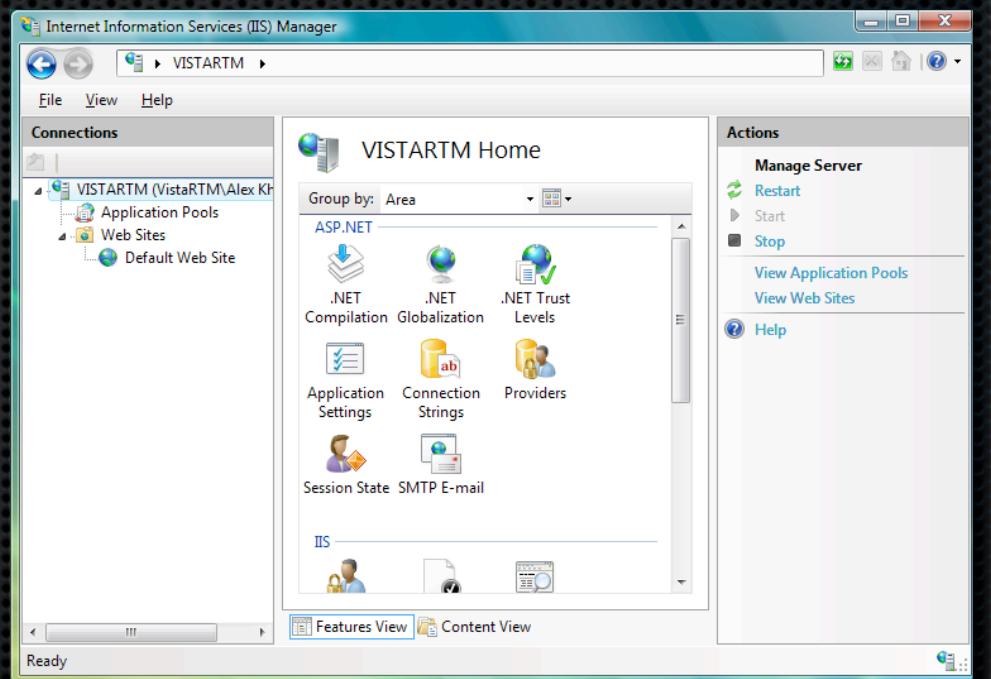
- Enable and facilitate network communications
- Automatic assignment of IP addresses (DHCP)
- Encryption / decryption and other security services (VPN)

# Web Servers

- Responsible for accepting HTTP requests from web clients and serving them HTTP responses (web pages such as HTML documents and linked objects (images, etc.))
- 2 Most Popular
  - Microsoft IIS
  - Apache

# Microsoft IIS

- Internet Information Services
- 2nd most popular web server
- Integrated with Microsoft Server 2008



# Apache

- Most popular web server
- 1st version written by Robert McCool in 1995
- Developed and maintained by an open group of developers
- Apache Software Foundation
- Available for most operating systems



# Network Operating System

- Aka: Server Operating System
- Manages concurrent requests from clients and provides the security necessary in a multiuser environment
- Designed from the ground up to provide platforms for multi-user, frequently business-critical, networked applications.
- Focus tends to be on security, stability and collaboration, rather than interface

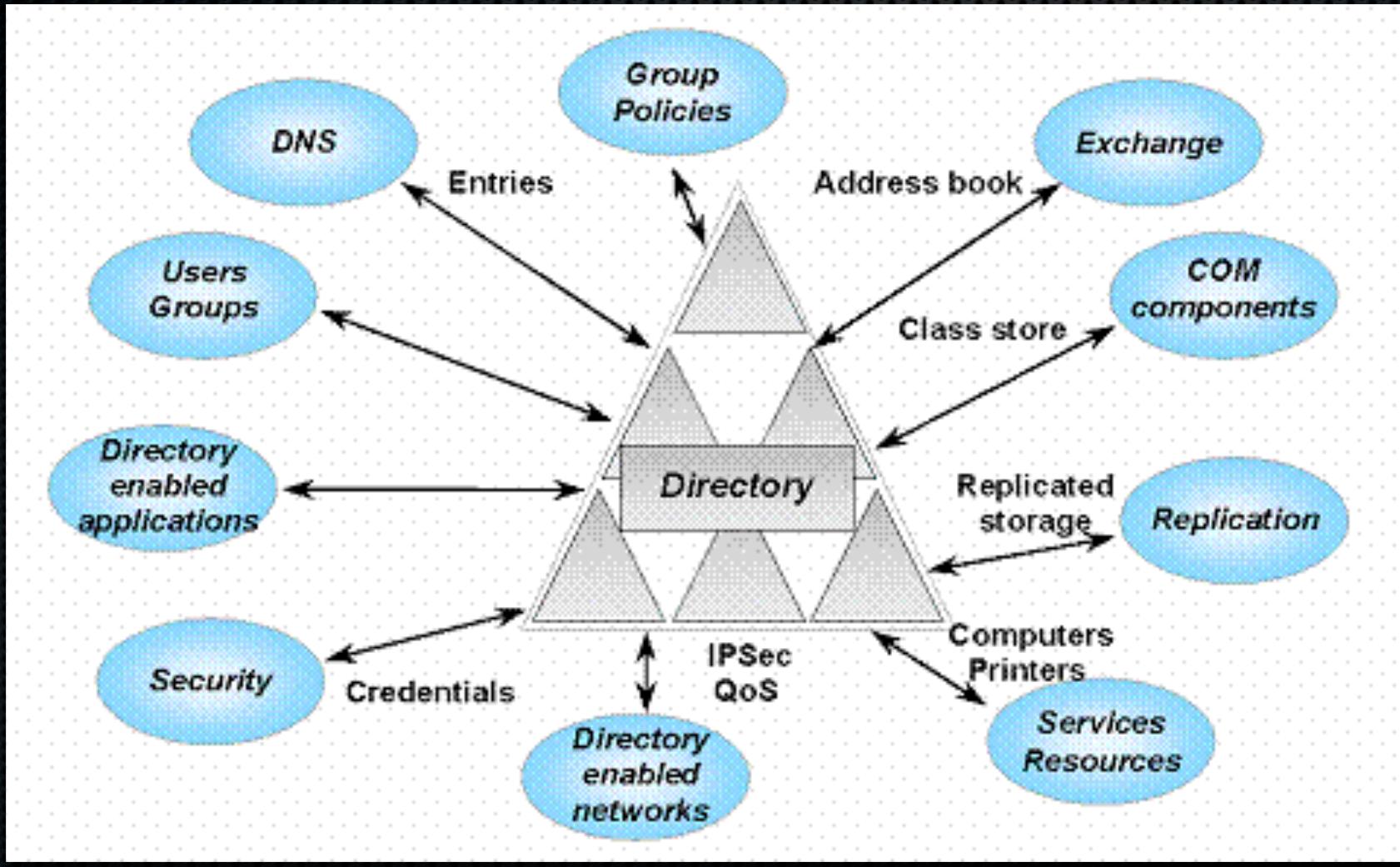
# Windows Server

- Windows NT
- Windows Server 2000
- Windows Server 2003
- Windows Server 2008

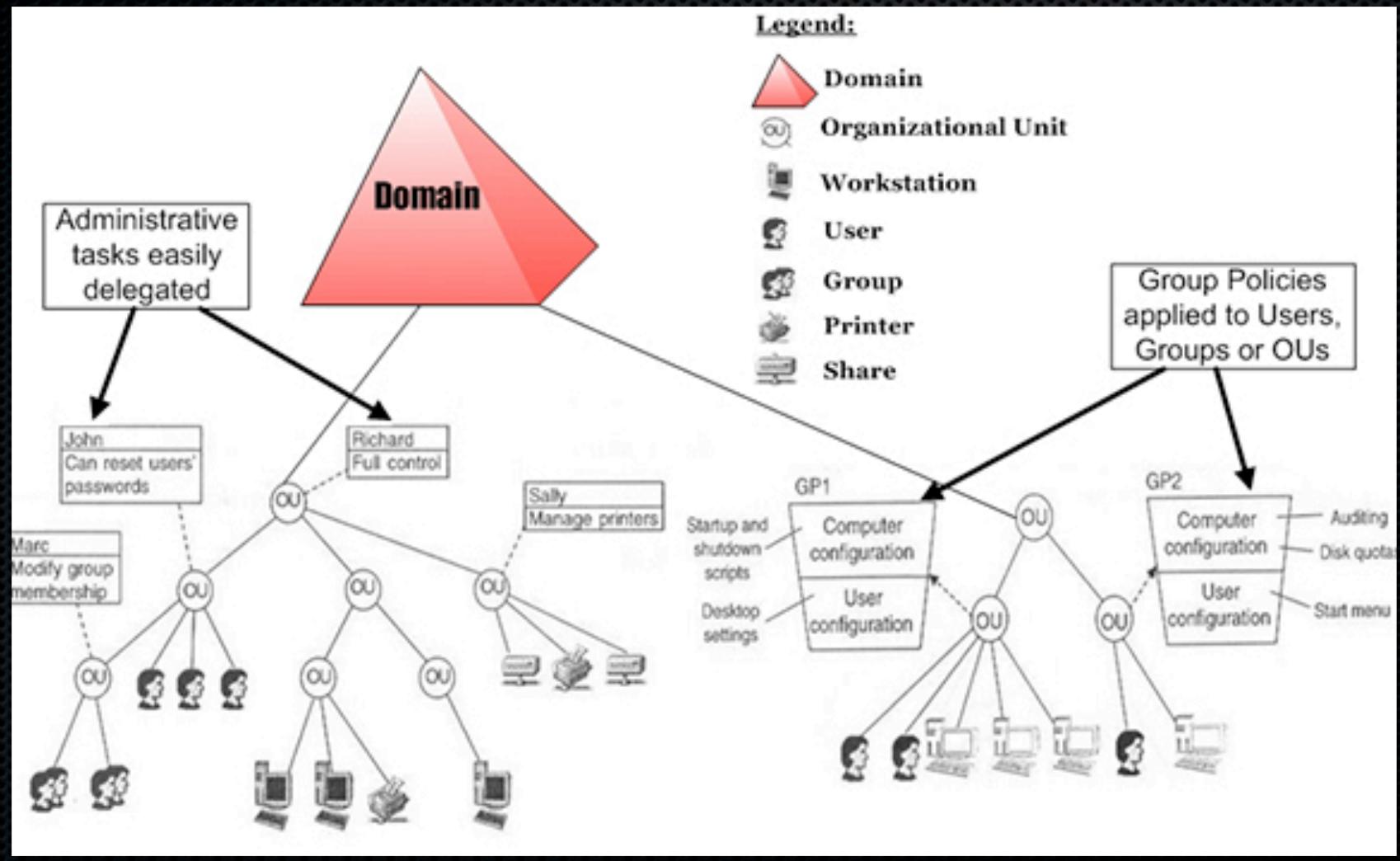
# Windows Server

- Domain Controller
- stores user account information, authenticates users and enforces security policy
- Maintains the Directory Service
- software system that stores and organizes information in a directory, and provides access to that information

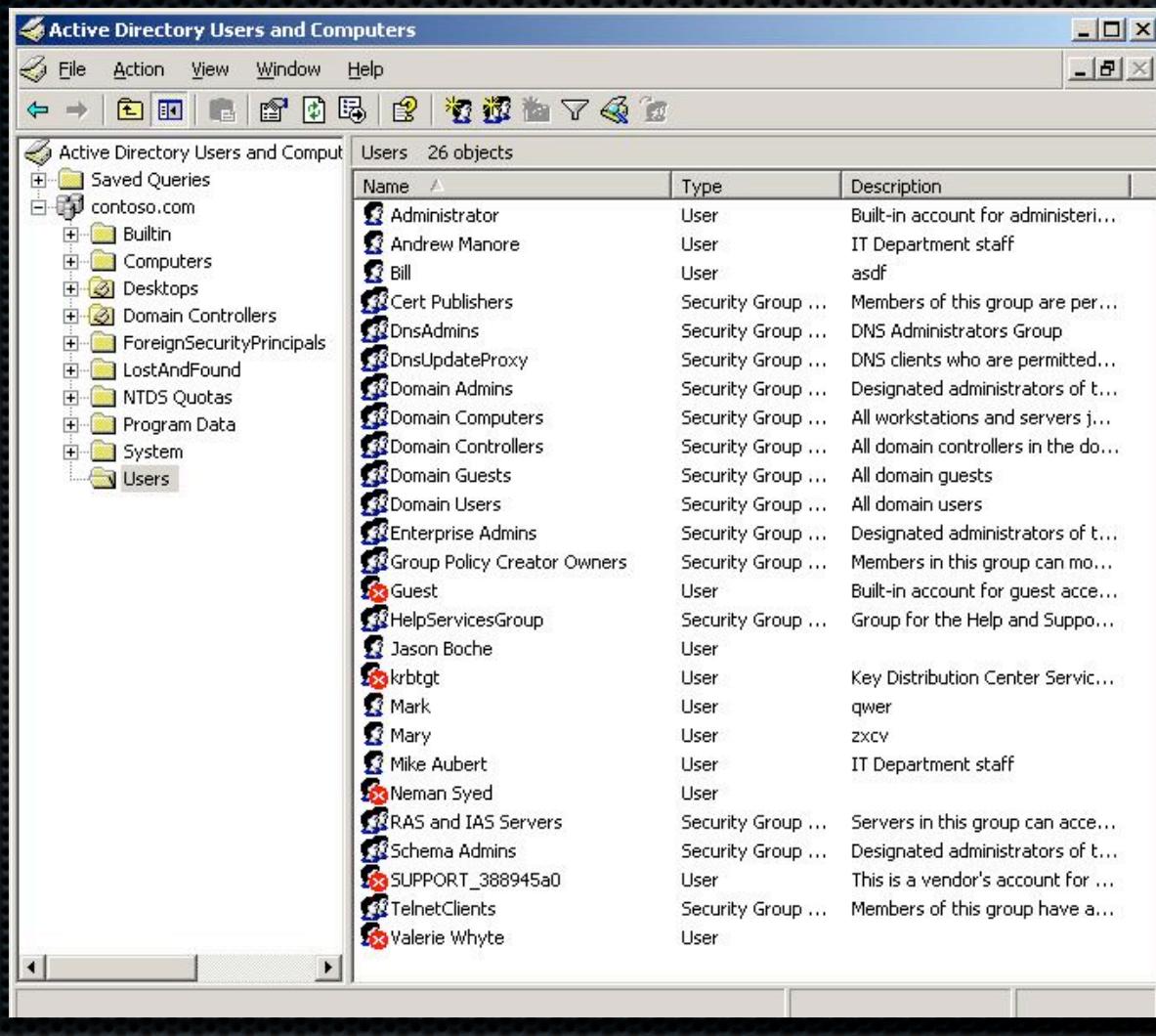
# Directory



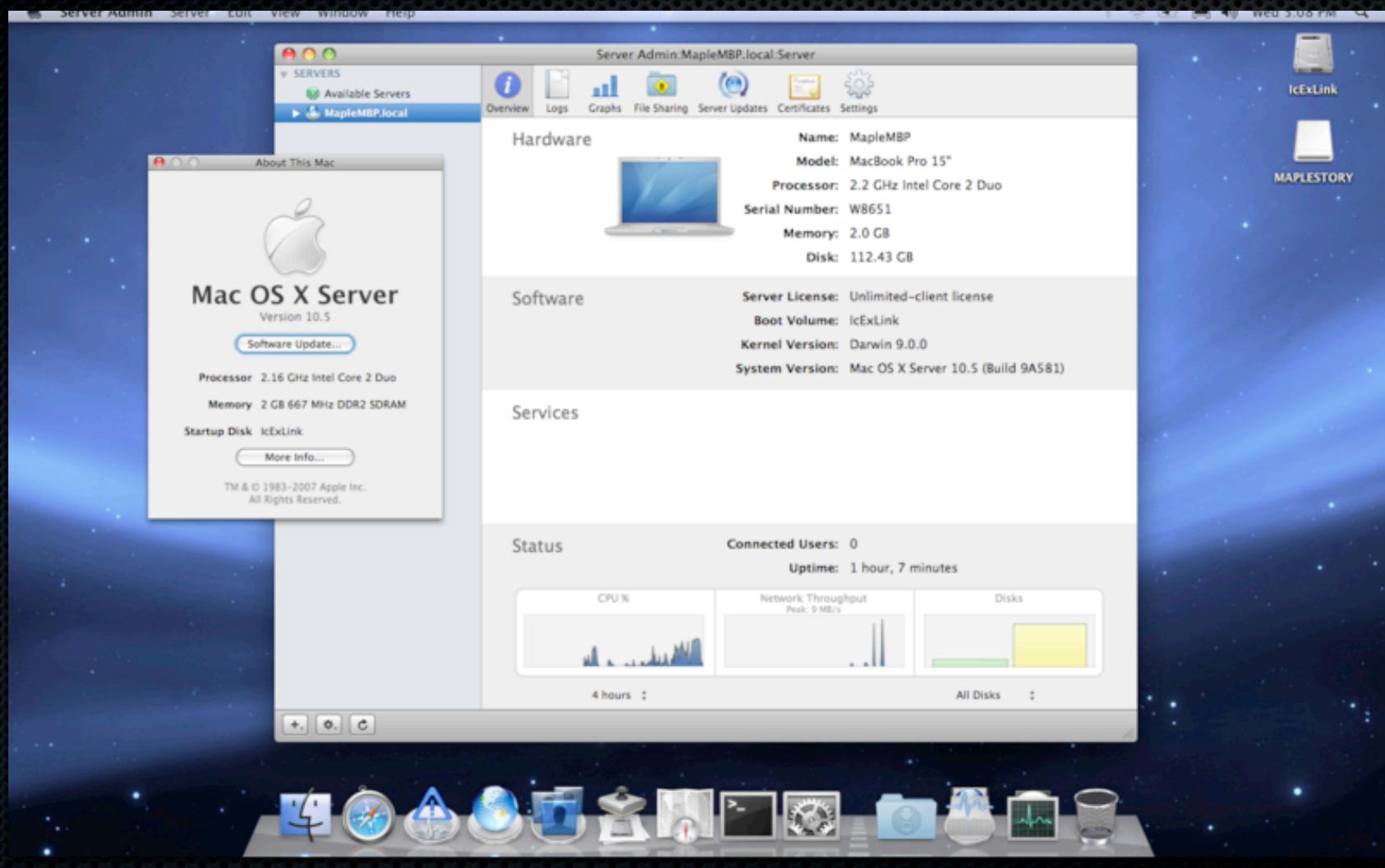
# Directory



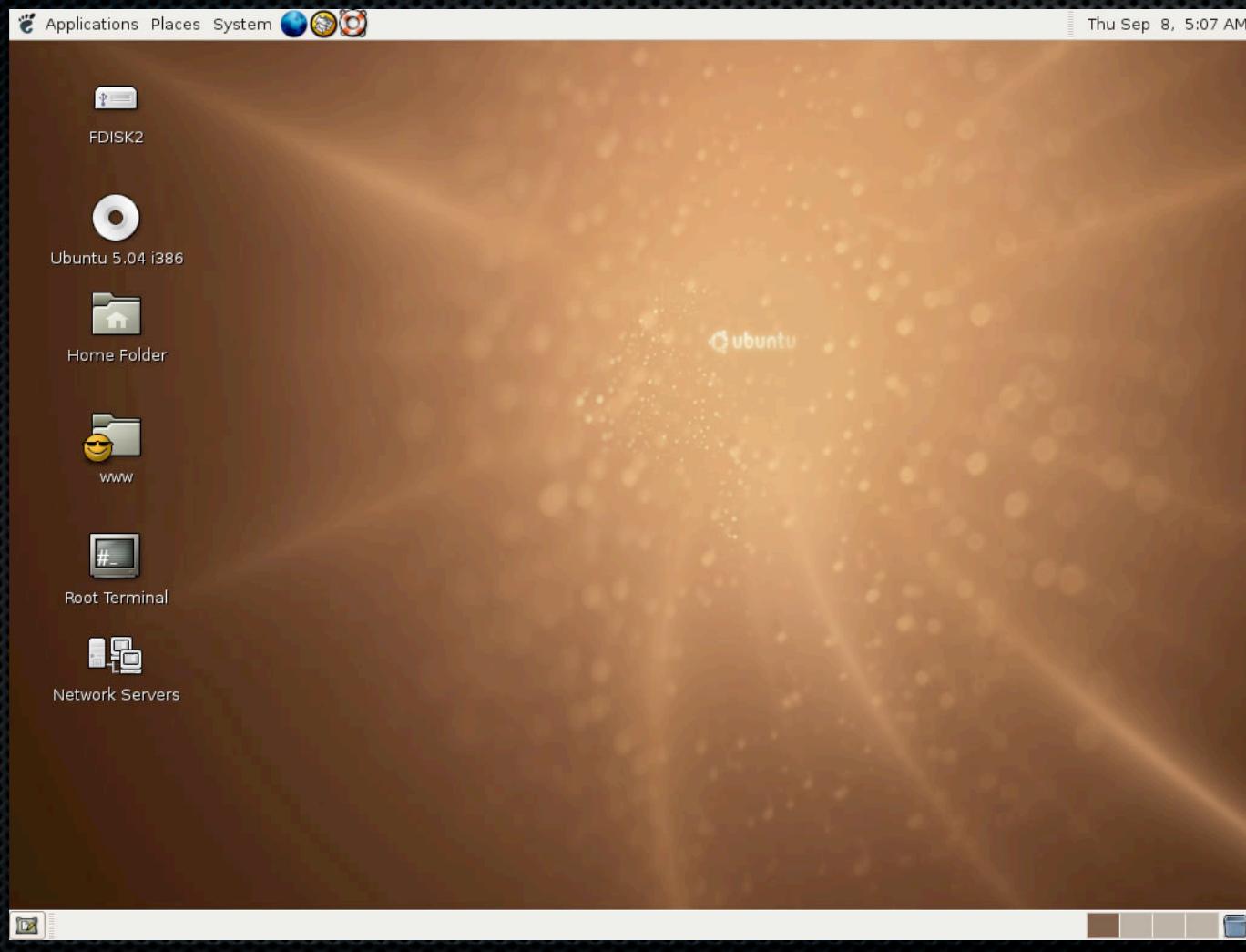
# Active Directory

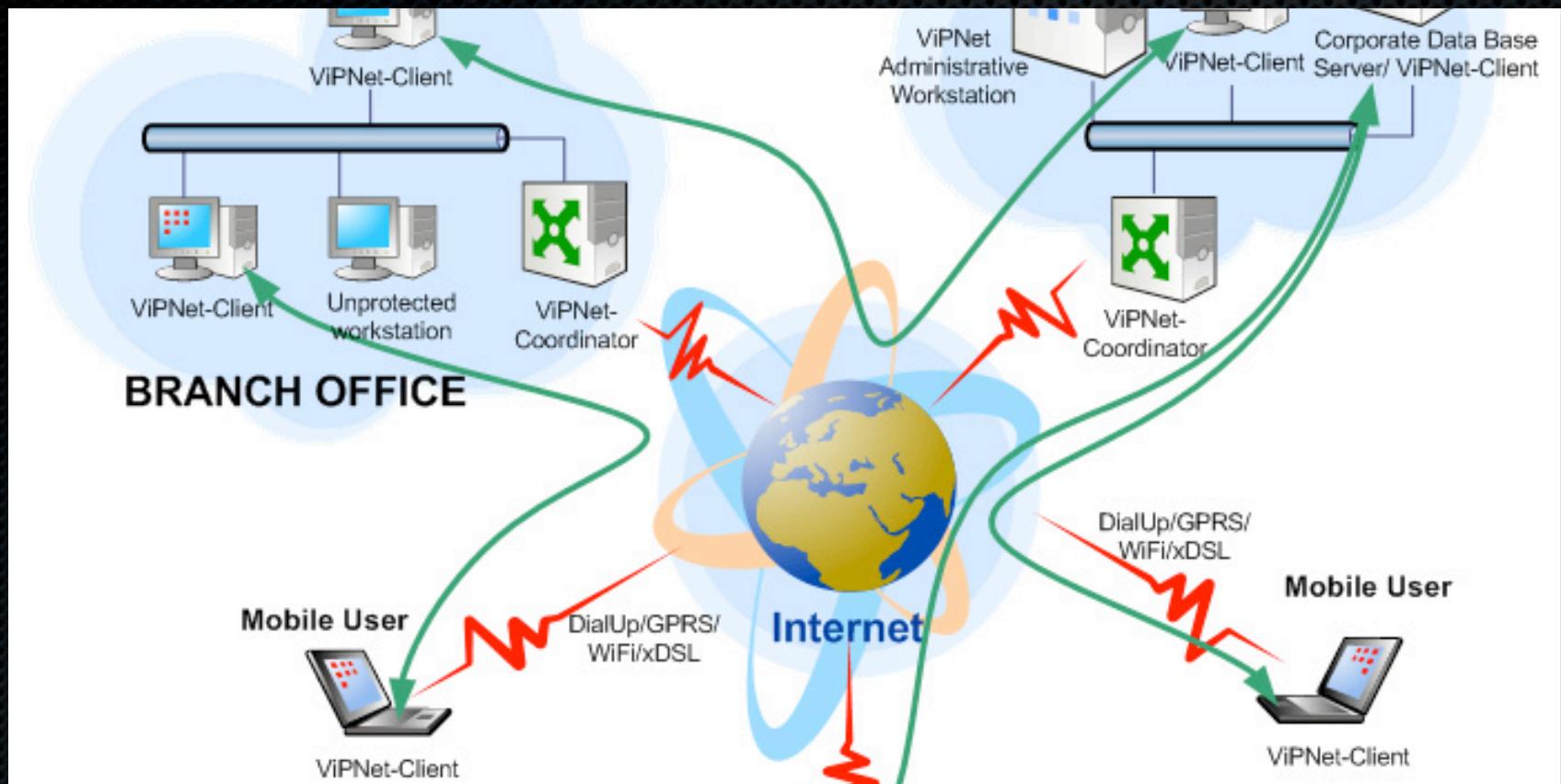


# Mac OS X Server



# Linux Server





# Remote Access

## Telecommuting for the masses!

# Remote Access

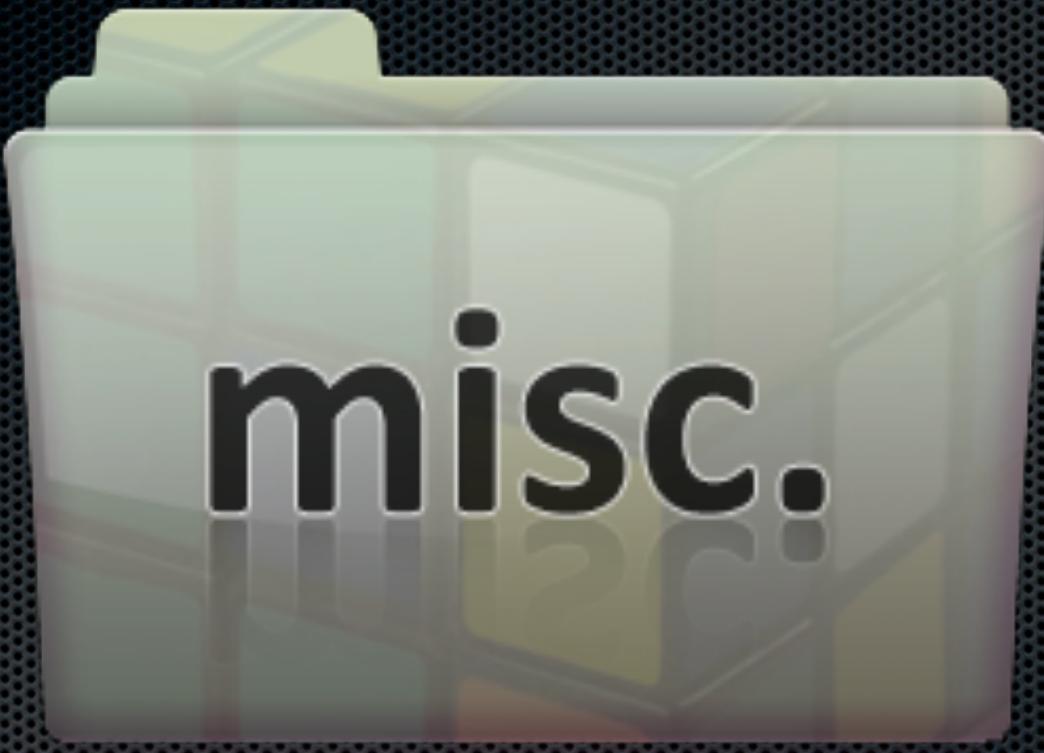
- RAS Server
  - Remote Access Service
  - Runs over a modem link
- VPN Server
  - Virtual Private Network

# VPN

- A network connection carried over a shared or public network (Internet)
- Encrypts the data. Only the client and the server can read it.
- Cost less than dedicated connections
- Cheaper than setting up a WAN

# VPN Protocols

- Both sides must have a networking protocol in common
  - TCP/IP, IPX, AppleTalk
- Both sides need to establish a tunnel
  - PPTP
  - L2TP
  - IPSEC
- Both sides agree on an encryption technique



# Miscellaneous

Stuff you should know that doesn't really fit anywhere else

# URI Scheme

**<scheme name> : <hierarchical part> [ ? <query> ] [ # <fragment> ]**

- **Scheme name** - protocol (method)
- **Hierarchical part** - starts with “//”, user info terminated with “@”, port starting with “:”
- **Query** - optional part separated with a “?”, which contains additional identification info which is not hierarchical in nature
- **Fragment** - optional part separated with a “#”. Holds additional identifying info for a secondary resource

# URI Scheme

<scheme name> : <hierarchical part> [ ? <query> ] [ # <fragment> ]

HTTP://username:password@example.com:1024/folder1/folder2/  
index.dtb?type=car?name=porsche#911

# Absolute & Relative Paths

- Absolute Paths
  - Link uses the full URL of an object or page
  - <http://www.google.com/intl/en/about.html>
- Relative Path
  - Used to send a visitor to another page within your site or include an object from your site (image, etc)

# MIME

- Multipurpose Internet Mail Extensions
- Describes content type
- Originally extended the format of email to support non-ASCII character sets and non-text attachments
- Has grown beyond email and now describes content type in general including for the web

# File Transfer Protocol

- Used to transfer data from one computer to another through a network
- Uses 2 ports for communication
  - Port 20 for data transfers
  - Port 21 for control / commands
- Client and Server software required

# FTP

1. Using client FTP software a user connects to an FTP server
2. FTP daemon on server asks for an account number (username) and password
3. Command link is opened between the computer and the server
4. When a command is issued to download a file the client software opens a second connection called the data link.
5. File is downloaded and the data link is closed

# FTP Clients for Mac

- Mac FTP Clients
- Cyberduck - <http://cyberduck.ch/>
- Fugu - <http://www.versiontracker.com/dyn/moreinfo/macosx/15693>
- Transmit - <http://www.panic.com/transmit/> (30 day trial)

# SFTP

- SSH FTP or Secure FTP
- Is not FTP over SSH but an entirely separate protocol



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