

# Networking



## Networking Fundamentals

### 1.5.1 - Common Ports

**What are some common port numbers and what protocols are attached to them?**

#### Overview

The student will explain common ports and protocols, their application, and encrypted alternatives

#### Grade Level(s)

10, 11, 12

### Cyber Connections

- Threats & Vulnerabilities
- Networks & Internet
- Hardware & Software

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## Teacher Notes:

# CompTIA N10-008 Network+ Objectives

## Objective 1.5

- Explain common ports and protocols, their application, and encrypted alternatives
  - Protocols and Ports

# Protocols

## Protocols

## Ports

File Transfer Protocol (FTP)	20/21
Secure Shell (SSH)	22
Secure File Transfer Protocol (SFTP)	22
Telnet	23
Simple Mail Transfer Protocol (SMTP)	25
Domain Name System (DNS)	53
Dynamic Host Configuration Protocol (DHCP)	67/68
Trivial File Transfer Protocol (TFTP)	69
Hypertext Transfer Protocol (HTTP)	80
Post Office Protocol v3 (POP3)	110
Network Time Protocol (NTP)	123
Internet Message Access Protocol (IMAP)	143
Simple Network Management Protocol (SNMP)	161/162
Lightweight Directory Access Protocol (LDAP)	389
Hypertext Transfer Protocol Secure (HTTPS)	443
HTTPS [Transport Layer Security (TLS)]	443
Server Message Block (SMB)	445
Syslog	514
SMTP TLS	587
Lightweight Directory Access Protocol (over SSL) (LDAPS)	636
IMAP over SSL	993
POP3 over SSL	995
Structured Query Language (SQL) Server	1433
SOLnet	1521
MySQL	3306
Remote Desktop Protocol (RDP)	3389
Session Initiation Protocol (SIP)	5060/5061

## Teacher Notes:

### Why Port Numbers?

When packets are being sent between two machines, the IP address identifies what machines the packets are going to and from, but there is also a port number attached with the addressing information. This port number signifies where on the machine the packet is going as well as what type of service the packet is sending. For example, if a packet is sent with the IP Address of 3.16.75.211 and the port number 3389, then this packet is going to the machine with the IP Address 3.16.75.211 to the specific port 3389, and since port 3389 is the RDP (remote desktop protocol), the service it is looking to use is for a remote desktop.

A port can be any number between 1 and 65,535, however, only the first 1023 ports are what is known as the well-known ports. These port numbers are assigned their values in accordance with RFC 3232. The rest of the ports, ports 1,024 - 65,535, are known as registered ports and a lot are reserved for different protocols. While most well-known ports/registered ports are not needed to be known on the Net+ exam (like port 666 being reserved for the videogame Doom), the following well-known ports/Registered Ports are specified on the Net+ exam:

Protocol	Port Number	TCP/UDP	Description
File Transfer Protocol (FTP)	20/21	TCP	Transfers files between two systems
Secure Shell (SSH)	22	TCP	Remote log-in securely to another machine over unsecure networks, typically for CLI
Secure File Transfer Protocol (SFTP)	22	TCP	Transfers files between machines securely
Telnet	23	TCP	Text communication between two machines in plaintext
Simple Mail Transfer Protocol (SMTP)	25	TCP	Send and receive email messages
Domain Name System (DNS)	53	Both	Naming system for IP Addresses

## Teacher Notes:

Dynamic Host Configuration Protocol (DHCP)	67/68	UDP	Network naming protocol for networks that automatically assign IP Addresses
Trivial File Transfer Protocol (TFTP)	69	UDP	Transfers files from one system to another with lockstep method
Hypertext Transfer Protocol (HTTP)	80	TCP	Web traffic without encryption
Post Office Protocol v3 (POP3)	110	TCP	A client can retrieve emails from an email server
Network Time Protocol (NTP)	123	UDP	Clock synchronization between two machines
Internet Message Access Protocol (IMAP)	143	TCP	A client can retrieve emails from an email server
Simple Network Management Protocol (SNMP)	161/162	Both	Hosts the information about machines on a network
Lightweight Directory Access Protocol (LDAP)	389	TCP	Contains directory information for a network
Hypertext Transfer Protocol Secure (HTTPS) [Secure Sockets Layer (SSL)]	443	TCP	Web traffic with SSL encryption
HTTPS [Transport Layer Security (TLS)]	443	Both	Web traffic with TLS encryption
Server Message Block (SMB)	445	TCP	Microsoft created to provide access to devices on a network (printers, files, etc...)
Syslog	514	UDP	Logging messages on a system
SMTP TLS	587	TCP	Receives emails securely with SMTP

## Teacher Notes:

Lightweight Directory Access Protocol (over SSL) (LDAPS)	636	TCP	Contains directory information for a network securely with SSL encryption
IMAP over SSL	993	TCP	Uses IMAP to retrieve emails securely using SSL encryption
POP3 over SSL	995	Both	Uses POP3 to retrieve emails securely using SSL encryption
Structured Query Language (SQL) Server	1433	Both	Database server
SOLnet	1521	Both	Oracle SQL databases
MySQL	3306	TCP	MySQL database port to edit a MySQL database
Remote Desktop Protocol (RDP)	3389	TCP	Access a machine's desktop remotely
Session Initiation Protocol (SIP)	5060/5061	Both	Real-time sessions that include voice, video, text messaging, etc...