

Ch 4: Network Management Tools

Covered in CH 5 &6

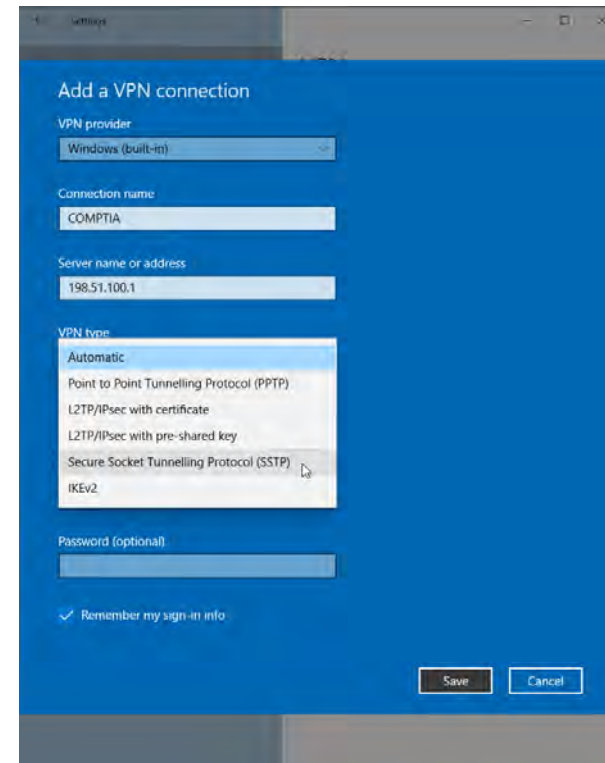


Topic A: Network Connectivity

- PAN (personal area network): consists of personal devices such as a cell phone and laptop
- LAN (local area network): group of computers connected by cabling and one or more network switches that are all installed at a single location.
- WLAN (wireless local area network): uses radios and antennas for data transmission and reception. WIFI
- MAN (metropolitan area network): covers a large campus or city
- WAN (wide area network): covers a large geographic area and is made up of small networks
- SAN (Storage Area Network) is a specialized, high-speed network that provides network access to storage devices.

WWAN & VPN

- Wireless wide area network (WWAN)
 - Cellular adapter and SIM card
 - Metered connections and limitations
- Virtual private network (VPN)
 - Protocol support in Windows versus third-party clients
 - Remote network address
 - Connecting and disconnecting

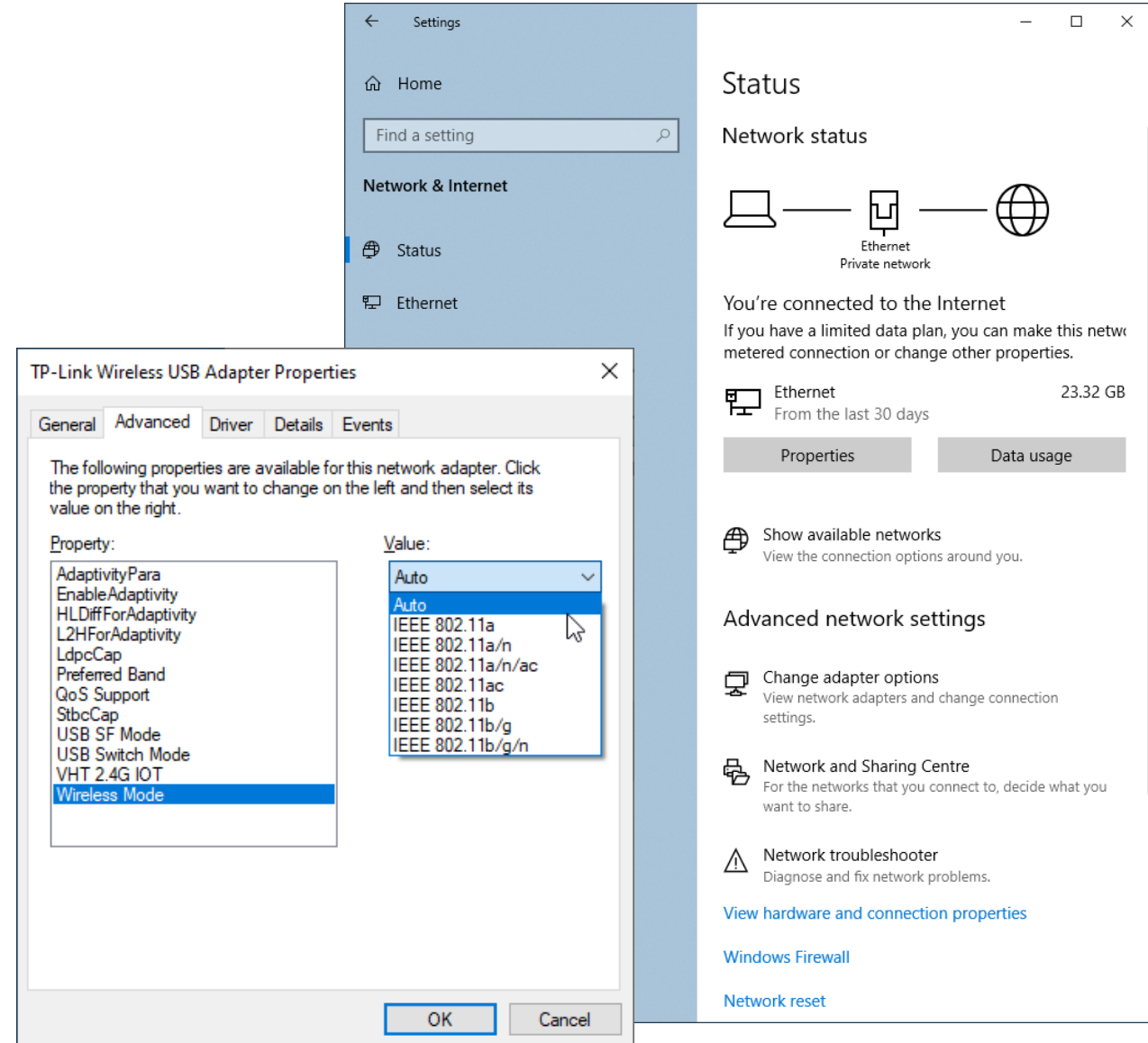


IP Addressing

- Default gateway
- Domain Name System (DNS) settings
- Static versus dynamic configuration
- Internet Protocol (IP) addressing scheme
- IPv4 address
- IPv6 address

Connection Types

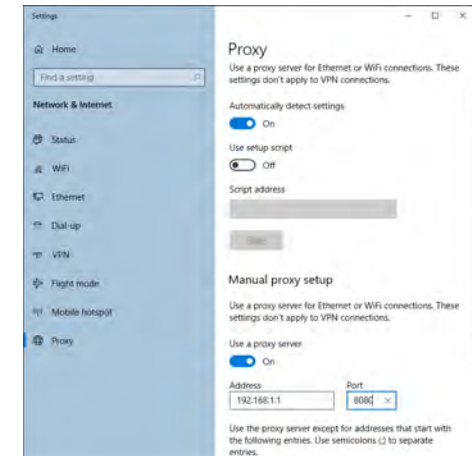
- Wired (Ethernet)
 - Device Manager properties
- Wireless
 - Network name/service set ID (SSID) list
 - Joining a non-broadcast network
 - Adapter properties
 - Standards support, transmit power, and roaming aggressiveness



Proxy Settings

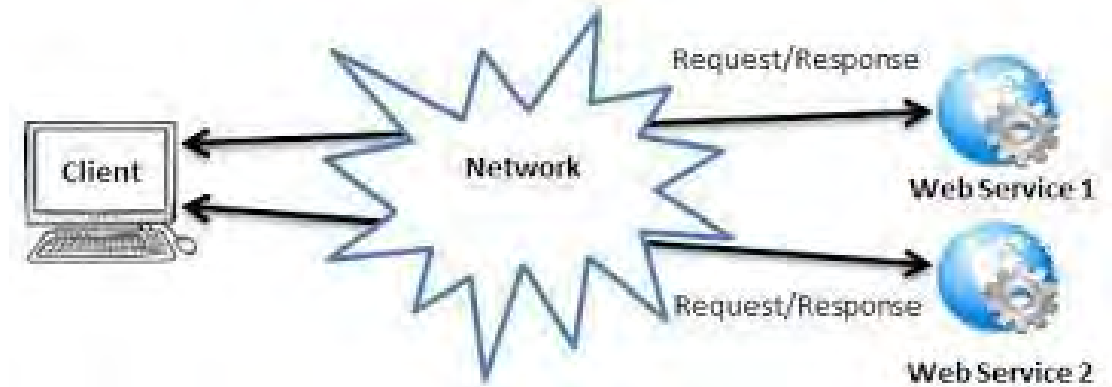
- A proxy server can improve both performance and security. PCs pass Internet requests to the proxy server, which forwards them to the Internet.
- Clients connect to Internet via server
 - Content filtering and security
 - Caching to improve performance
 - An intercepting or transparent proxy does not require any client setup (autoconfiguring)
 - If neither of these cases apply, each client must
 - Manual setup IP address and TCP port to use to forward traffic must be entered

These proxy settings are configured via Network & Internet settings

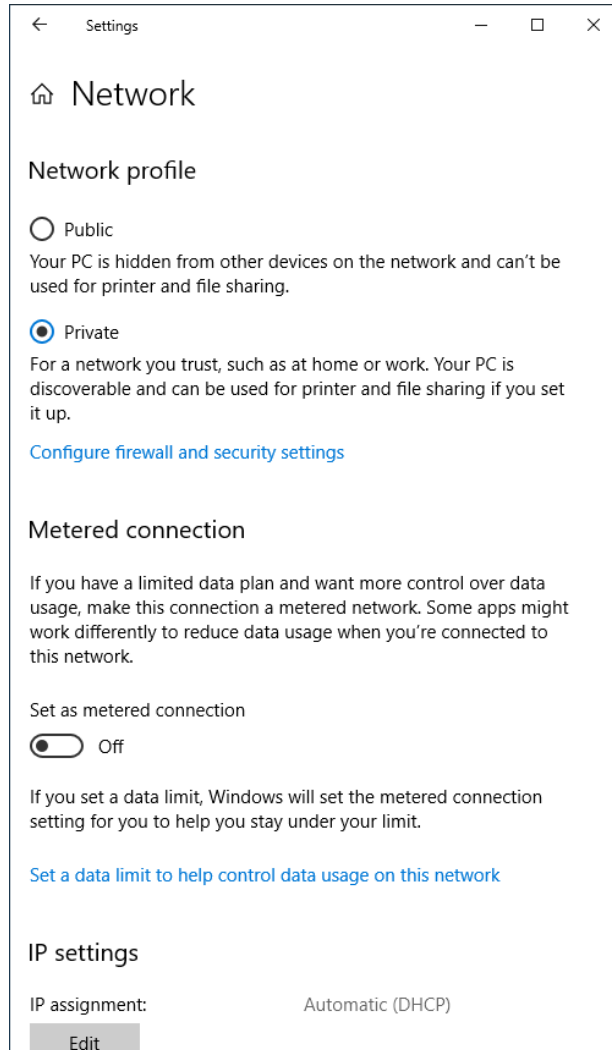


Windows Client Configuration

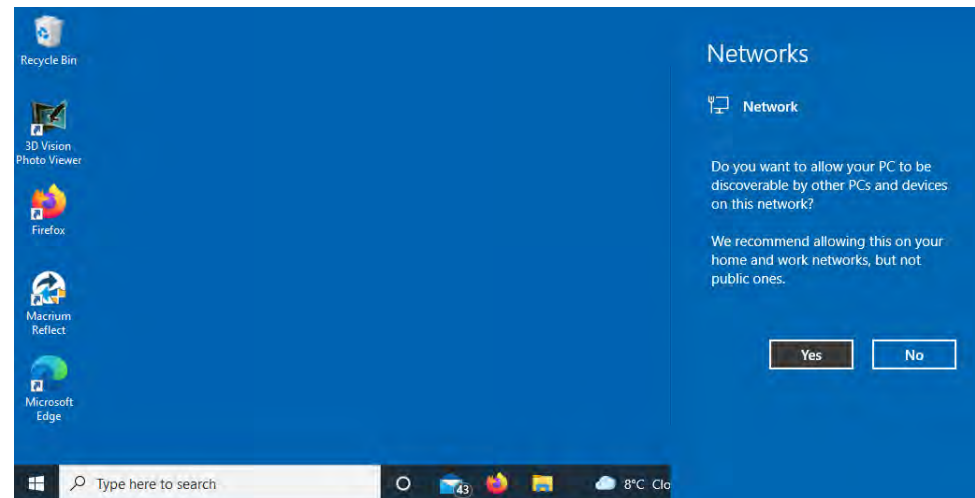
- Clients, protocols, and services
- IPv4 properties
 - Obtain an IP address automatically (DHCP)
 - Static configuration



Location Services



- Public versus private
- Network Location Awareness
- Controls whether host discovery and sharing is enabled
- Network navigation in File Explorer

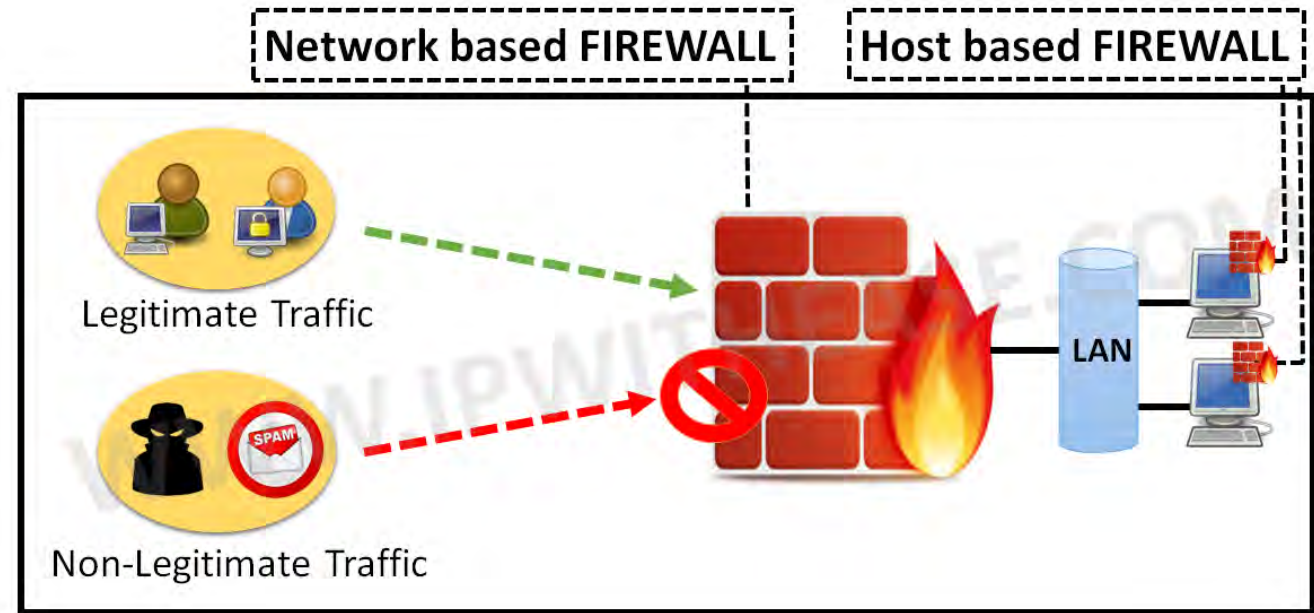


Firewalls

qwhen creating a firewall make sure u crteate diffrebnt rule ofr thr frsdt an sdseconf fire walll

Many types and implementations

- **Primary distinction:**
Network firewall: Inline on the network / Inspects all traffic
- Host firewall: Installed on host / Inspects traffic to that host



Network Troubleshooting

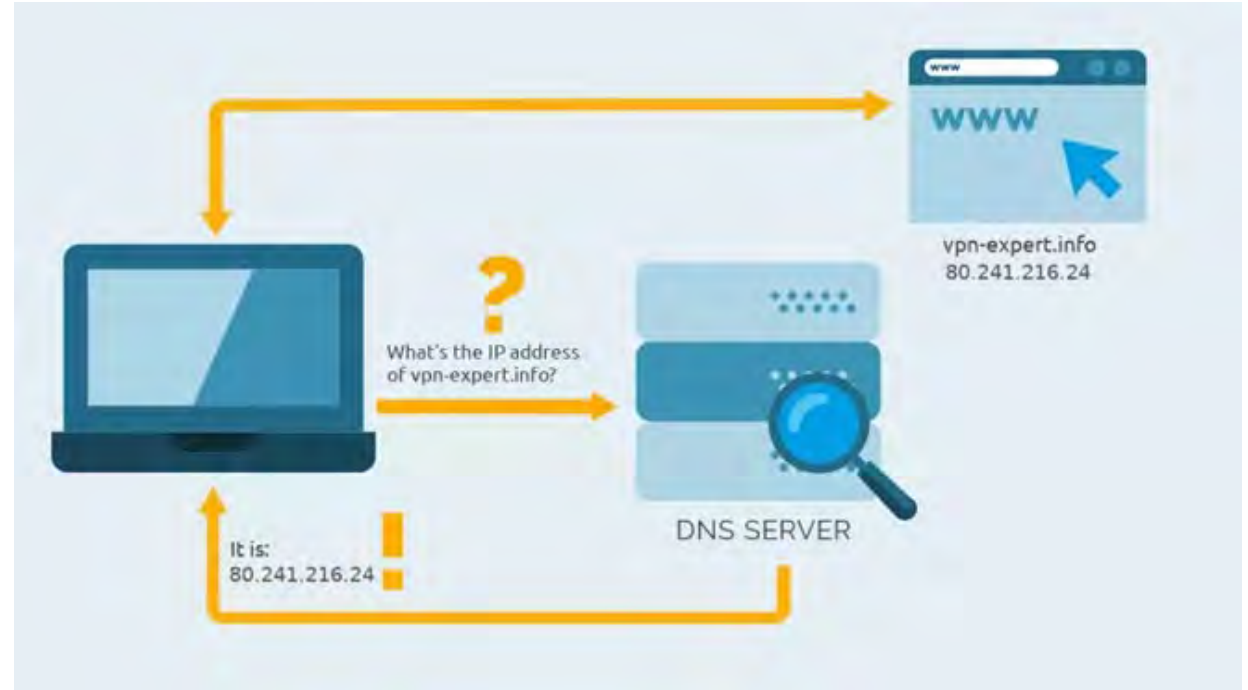
- Windows includes several utilities you can use to troubleshoot networking problems:
 - ping
 - ipconfig
 - nslookup
 - tracert
 - Two net commands
 - netstat

fixed



Network Troubleshooting

- Windows adapter error states
 - Limited connectivity versus No Internet
- ipconfig Command
 - (/all)
 - DHCP (/release and /renew)
 - DNS cache (/displaydns and /flushdns)
- Hostname Command
- Network reset



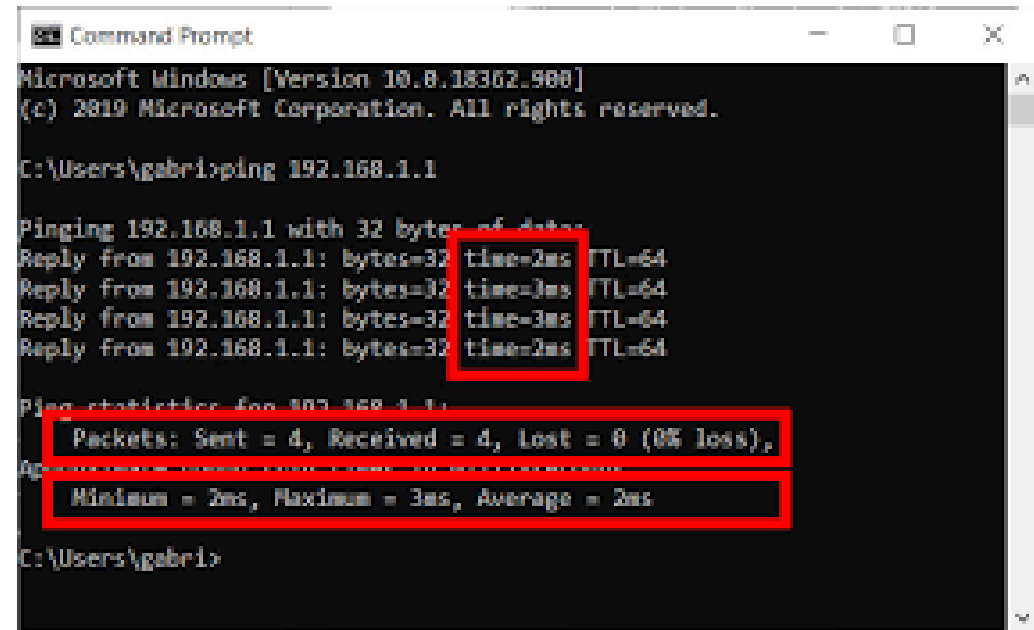
Network Ports Troubleshoot

- netstat
 - Report port status and connections
- Switches
 - -a to show all
 - -b and -o report process that opened the port
 - -n use numerical formats
 - -e and -s to report statistics



Network Connectivity

- ping to test connectivity with host
 - ping loopback and own IP
 - ping gateway
 - ping remote host
- Response types
 - Round-trip time (RTT) if responses received
 - Destination unreachable
 - No reply (request timed out)
 - ping by name



```
Microsoft Windows [Version 10.0.18362.988]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\gabriel>ping 192.168.1.1

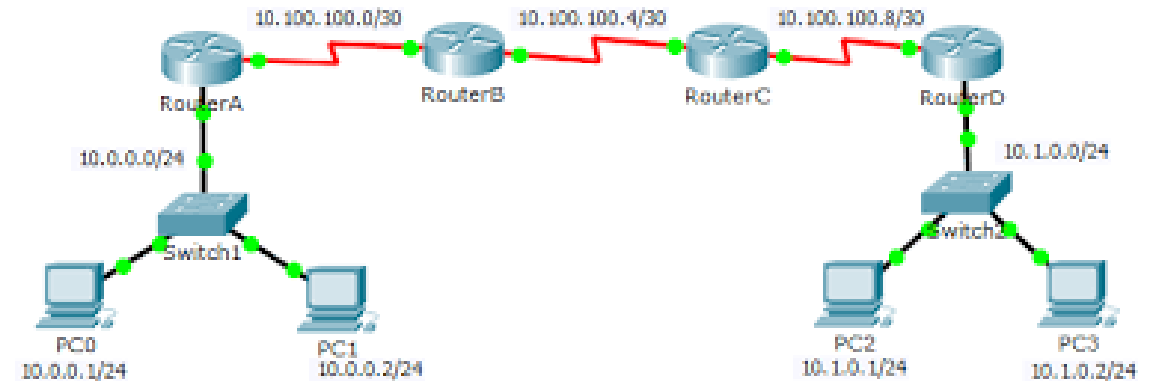
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Minimum = 2ms, Maximum = 3ms, Average = 2ms

C:\Users\gabriel>
```

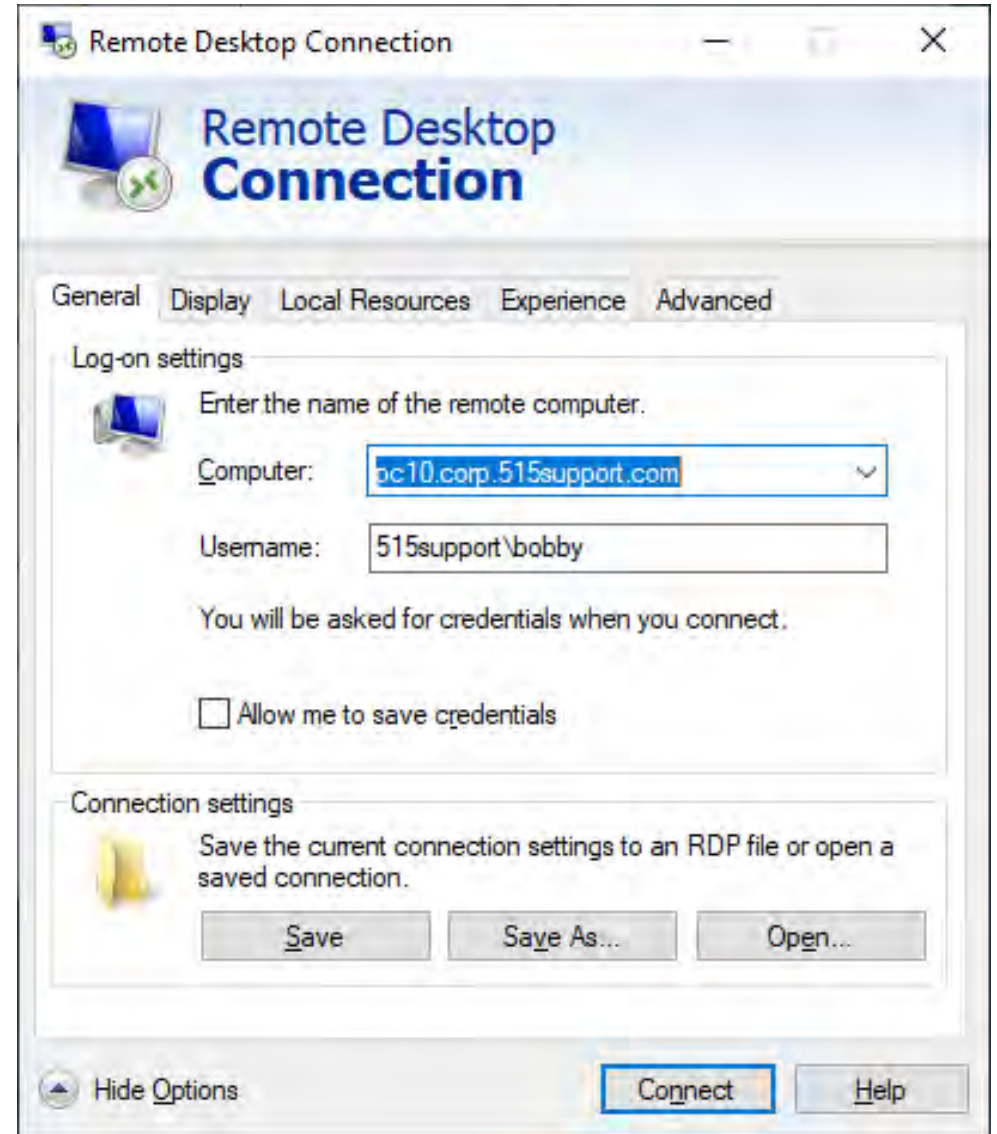
Network Connectivity

- pathing
 - Measure more accurate latency statistics
- tracert
 - Path from gateway to remote hosts
 - Hop count
 - Router ingress interface
 - RTT



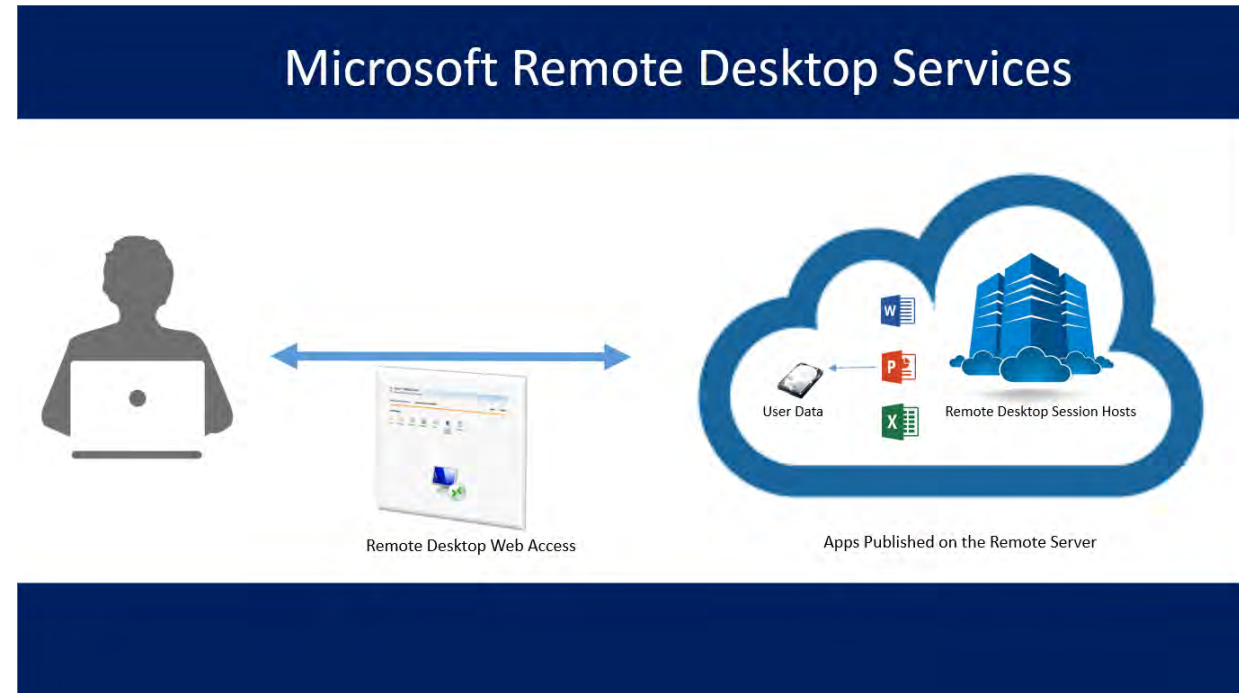
Remote Desktop Tools

- Virtual Network Computing (VNC)
 - macOS Screen Sharing
 - Secure versus unsecure third-party implementations
- Security considerations
 - Granting access
 - Preventing snooping
 - Patching vulnerabilities
- Remote Desktop Protocol (RDP)
 - mstsc.exe client app and session encryption
 - Multi-platform RDP clients



RDP Server and Security Settings

- Security considerations
 - Open-source RDP servers
 - Accounts allowed to connect
 - Network Level Authentication (NLA)
 - RDP Restricted Admin (RDPRAdmin) Mode and Remote Credential Guard
 - **TCP/3389** and risks from allowing port forwarding



Microsoft Remote Assistance

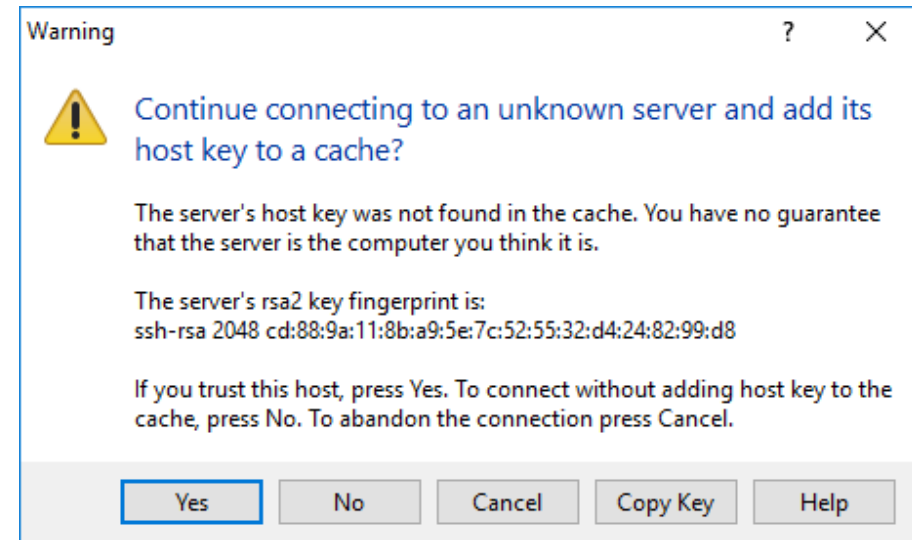
- Allows users to send invite to connect over RDP protected by password
- Chat and request control features
- Quick Assist feature better suited to connections over the Internet



Secure Shell

SSH client

- Password authentication
- Public key authentication
- Remote terminal access to command-line shell
- Secure Shell (SSH) server
 - Server's host key
 - TCP/22



Desktop Management and Remote Monitoring Tools

- Visibility
 - Remote monitoring and management (RMM)
 - Desktop management and unified endpoint management (UEM)
- Common features
 - Performance monitoring and log collection
 - Security scanning
 - Push deployment
 - Remote support
- Intel vPRO/AMD PRO hardware support for out-of-band (OOB) remote access

Remote Monitoring Tools

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Remote Monitoring Tools

- Screen-sharing software
 - Third-party remote desktop tools designed to work over the Internet
- Video-conferencing software
 - Most include a basic screen share client
- File transfer software
 - Easy sharing via Bluetooth
 - Apple AirDrop, Windows Nearby Sharing, and Android Nearby Shar
- Virtual private network (VPN)
 - Connect the remote host to the local network over a secure tunnel
 - Can be more secure than opening or port forwarding remote desktop/SSH ports