Application Layer Management Protocols

- Domain Name System (DNS)
- Dynamic Host Configuration Protocol (DHCP)
- Network Time Protocol (NTP)
- Simple Network Management Protocol (SNMP)
- Lightweight Directory Access Protocol (LDAP)
- LDAP Secure (LDAPS)
- Server Message Block (SMB)

Domain Name System (DNS)

Port: 53 **Transport Layer Protocol:** UDP

- Protocol that is used to resolve a domain name to its corresponding IP address
  - InstructorAlton.com → 162.0.232.236
- Uses TCP port 53 by default
- We'll be discussing DNS in detail in the **DNS Network Services** section of this course:
  - DNS Hierarchy
  - DNS Record Types
  - Name Resolution

Dynamic Host Configuration Protocol (DHCP)

Ports: 67, 68 **Transport Layer Protocol:** UDP

- Protocol that automatically assigns IP address configurations to devices on a network:
  - IP Address
  - Subnet Mask
  - Default Gateway
  - DNS Server
- We'll be discussing how DHCP works in detail in the **Assigning IP Addresses** section of this course
- Uses two UDP ports 67 and 68 by default

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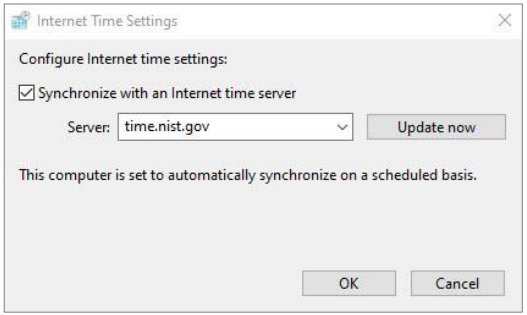
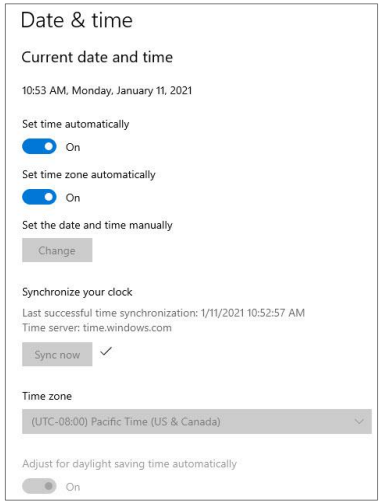
Network Time Protocol (NTP)

Port: 123 **Transport Layer Protocol:** TCP

- Protocol that automatically synchronizes a system's time with a network time server.
  - Important for time-dependent network applications and protocols.
  - If a system is configured with the incorrect time, it may not be able to access network services.
  - Authentication will often fail if time isn't properly synchronized between devices.
- Uses TCP port 123 by default.





Simple Network Management Protocol (SNMP)

Port: 161 **Transport Layer Protocol:** TCP

- Protocol used to monitor and manage network devices
- Allows admins to monitor and manage network devices and traffic.
- Allows network devices to communicate information about their state:
  - Memory
  - CPU
  - Bandwidth
- Uses TCP port 161 by default

Lightweight Directory Access Protocol (LDAP)

Port: 389 **Transport Layer Protocol:** TCP

- Protocol that provides a means to access and query directory service systems:
  - Usernames, Passwords, Computer Accounts, etc.
- Typically Unix/Linux-based or Microsoft Active Directory-based
- Uses TCP 389 by default

LDAP Secure (LDAPS)

Port: 636 **Transport Layer Protocol:** TCP

- LDAP over SSL
- A secure version of LDAP that utilizes SSL to encrypt LDAP network traffic
- Uses TCP port 636 by default

Server Message Block (SMB)

Port: 445 **Transport Layer Protocol:** TCP

- Network and file sharing protocol commonly used in Microsoft environments
- Allows systems to share their files and printers with other systems
- Uses TCP port 445 by default