**OSI Model Overview**

The **Open Systems Interconnection (OSI) Model** is a conceptual framework that standardizes the functions of a telecommunication or computing system into seven distinct layers. This model facilitates interoperability and communication between different network systems and devices.

**The 7 Layers of the OSI Model (Bottom-Up)**

1. **Physical Layer (Layer 1)**
   * **Function**: Transmits raw bitstreams over a physical medium.
   * **Examples**: Cables, network interface cards (NICs), hubs.
2. **Data Link Layer (Layer 2)**
   * **Function**: Provides node-to-node data transfer and handles error correction from the physical layer.
   * **Examples**: MAC addresses, switches.
3. **Network Layer (Layer 3)**
   * **Function**: Determines how data is sent to the receiving devices.
   * **Examples**: IP addresses, routers.
4. **Transport Layer (Layer 4)**
   * **Function**: Provides reliable data transfer services to the upper layers.
   * **Examples**: TCP, UDP, port numbers.
5. **Session Layer (Layer 5)**
   * **Function**: Manages sessions between applications.
   * **Examples**: Establishing, managing, and terminating sessions.
6. **Presentation Layer (Layer 6)**
   * **Function**: Translates data between the application layer and the network.
   * **Examples**: Data encryption, compression, and translation.
7. **Application Layer (Layer 7)**
   * **Function**: Provides network services to end-user applications.
   * **Examples**: SMTP, FTP, Telnet.

**Mnemonics for Remembering OSI Layers**

To memorize the OSI layers from top (Layer 7) to bottom (Layer 1), you can use the following mnemonic:

* **"All People Seem To Need Data Processing"**
  + **A**pplication
  + **P**resentation
  + **S**ession
  + **T**ransport
  + **N**etwork
  + **D**ata Link
  + **P**hysical

Alternatively, from bottom (Layer 1) to top (Layer 7):

* **"Please Do Not Throw Sausage Pizza Away"**
  + **P**hysical
  + **D**ata Link
  + **N**etwork
  + **T**ransport
  + **S**ession
  + **P**resentation
  + **A**pplication

**Troubleshooting Using the OSI Model**

The OSI model aids in diagnosing network issues by isolating problems to specific layers. Common troubleshooting approaches include:

* **Bottom-Up Approach**: Start from the Physical Layer and move upward.
* **Top-Down Approach**: Start from the Application Layer and move downward.
* **Divide and Conquer**: Begin at the layer most likely causing the issue, then move up or down as needed.

**Common Issues by Layer**

* **Layer 1 (Physical)**: Faulty cables, disconnected hardware.
* **Layer 2 (Data Link)**: MAC address conflicts, switch issues.
* **Layer 3 (Network)**: Incorrect IP configurations, routing problems.
* **Layer 4 (Transport)**: Port blocking, firewall misconfigurations.
* **Layer 5 (Session)**: Session timeouts, authentication failures.
* **Layer 6 (Presentation)**: Data format mismatches, encryption issues.
* **Layer 7 (Application)**: Application crashes, protocol errors.