Welcome to Cyber Aces, Module 2! A firm understanding of network fundamentals is essential to being able to secure a network or attack one. This section provides a broad overview of networking, covering the fundamental concepts needed to understand computer attacks and defenses from a network perspective.
This training material was originally developed to help students, teachers, and mentors prepare for the Cyber Aces Online Competition. This module focuses on the basics of networking. This session is part of Module 2, Networking.

The three modules of Cyber Aces Online are Operating Systems, Networking, and System Administration.

For more information about the Cyber Aces program, please visit the Cyber Aces website at https://CyberAces.org/.
In this short section, we'll provide a brief introduction to the Session Layer and the Presentation Layer.
Sessions are important. The session layer provides flow control to unique connections between applications. The session layer creates and terminates application connections. TCP implements some session layer functionality itself:
- TCP maintains state using sequence numbers

Session layer functionality is often implemented at the Application Layer:
- Web applications use HTTP cookies to maintain sessions (though HTTP itself doesn’t support sessions)
The Presentation Layer is used by applications to establish a standard way of encoding data. More generally, the Presentation Layer is responsible for providing independence from data formats for Application Layer protocols. For example, encryption of data will often occur as part of the Presentation Layer, as would handling of character encoding (i.e., UTF-8). MIME (Multipurpose Internet Mail Extensions) is a Presentation Layer protocol that defines the formatting of e-mail messages, particularly multi-format messages and attachments. However, like the Session Layer, most common TCP/IP protocols implement Presentation Layer functions as part of the Application Layer protocol. For example, HTTP can handle character encoding.
The OSI model is not the only networking model; however, it is the one most commonly referred to. Most of the other models lump the Presentation and Session layers into the Application layer. Most often, the OSI layers 5 and 6 are implemented and included in the Application Layer.

Above image taken from: https://en.wikipedia.org/wiki/Internet_protocol_suite
This concludes the discussion about Layer 5 and 6, the Session and Presentation layers. In the next tutorial we'll discuss Layer 7, the Application Layer.
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