**Presentation layer**

From Wikipedia, the free encyclopedia

[Jump to navigation](https://en.wikipedia.org/wiki/Presentation_layer#mw-head) [Jump to search](https://en.wikipedia.org/wiki/Presentation_layer#searchInput)

|  |
| --- |
| [**OSI model**](https://en.wikipedia.org/wiki/OSI_model) **by** [**layer**](https://en.wikipedia.org/wiki/Abstraction_layer) |
| 7.  [Application layer](https://en.wikipedia.org/wiki/Application_layer)[[show]](https://en.wikipedia.org/wiki/Presentation_layer) |
| 6.  Presentation layer[[show]](https://en.wikipedia.org/wiki/Presentation_layer) |
| 5.  [Session layer](https://en.wikipedia.org/wiki/Session_layer)[[show]](https://en.wikipedia.org/wiki/Presentation_layer) |
| 4.  [Transport layer](https://en.wikipedia.org/wiki/Transport_layer)[[show]](https://en.wikipedia.org/wiki/Presentation_layer) |
| 3.  [Network layer](https://en.wikipedia.org/wiki/Network_layer)[[show]](https://en.wikipedia.org/wiki/Presentation_layer) |
| 2.  [Data link layer](https://en.wikipedia.org/wiki/Data_link_layer)[[show]](https://en.wikipedia.org/wiki/Presentation_layer) |
| 1.  [Physical layer](https://en.wikipedia.org/wiki/Physical_layer)[[show]](https://en.wikipedia.org/wiki/Presentation_layer) |
| * [v](https://en.wikipedia.org/wiki/Template:OSI_model) * [t](https://en.wikipedia.org/wiki/Template_talk:OSI_model) * [e](https://en.wikipedia.org/w/index.php?title=Template:OSI_model&action=edit) |

In the seven-layer [OSI model](https://en.wikipedia.org/wiki/OSI_model) of [computer networking](https://en.wikipedia.org/wiki/Computer_network), the **presentation layer** is **layer 6** and serves as the data translator for the [network](https://en.wikipedia.org/wiki/Computer_network).[[1]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Network+_Guide_to_Networks-1)[[2]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Microsoft_Technet-2) It is sometimes called the syntax layer.[[3]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-3)



**Contents**

* [1 Description](https://en.wikipedia.org/wiki/Presentation_layer#Description)
* [2 Services](https://en.wikipedia.org/wiki/Presentation_layer#Services)
* [3 Sublayers](https://en.wikipedia.org/wiki/Presentation_layer#Sublayers)
  + [3.1 CASE](https://en.wikipedia.org/wiki/Presentation_layer#CASE)
  + [3.2 SASE](https://en.wikipedia.org/wiki/Presentation_layer#SASE)
* [4 Protocols](https://en.wikipedia.org/wiki/Presentation_layer#Protocols)
* [5 References](https://en.wikipedia.org/wiki/Presentation_layer#References)

**Description**

The presentation layer is responsible for the formatting and delivery of information to the application layer for further processing or display.[[4]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-4) It relieves the application layer of concern regarding syntactical differences in [data](https://en.wikipedia.org/wiki/Data) representation within the end-[user](https://en.wikipedia.org/wiki/User_(computing)) systems. An example of a presentation service would be the conversion of an [EBCDIC](https://en.wikipedia.org/wiki/EBCDIC)-coded text [computer file](https://en.wikipedia.org/wiki/Computer_file) to an [ASCII](https://en.wikipedia.org/wiki/ASCII)-coded file.

The presentation layer is the lowest layer at which application programmers consider [data structure](https://en.wikipedia.org/wiki/Data_structure) and presentation, instead of simply sending data in the form of [datagrams](https://en.wikipedia.org/wiki/Network_packet) or packets between hosts. This layer deals with issues of string representation - whether they use the [Pascal](https://en.wikipedia.org/wiki/Pascal_(programming_language)) method (an integer length field followed by the specified amount of bytes) or the [C](https://en.wikipedia.org/wiki/C_(programming_language))/[C++](https://en.wikipedia.org/wiki/C%2B%2B) method (null-terminated strings, e.g. "thisisastring\0"). The idea is that the application layer should be able to point at the data to be moved, and the presentation layer will deal with the rest.

[Serialization](https://en.wikipedia.org/wiki/Serialization) of complex data structures into flat byte-strings (using mechanisms such as [TLV](https://en.wikipedia.org/wiki/Type-length-value) or [XML](https://en.wikipedia.org/wiki/XML)) can be thought of as the key functionality of the presentation layer.

[Encryption](https://en.wikipedia.org/wiki/Encryption) is typically done at this level too, although it can be done on the [application](https://en.wikipedia.org/wiki/Application_layer), [session](https://en.wikipedia.org/wiki/Session_layer), [transport](https://en.wikipedia.org/wiki/Transport_layer), or [network layers](https://en.wikipedia.org/wiki/Network_layer), each having its own advantages and disadvantages.[[1]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Network+_Guide_to_Networks-1) [Decryption](https://en.wikipedia.org/wiki/Decryption) is also handled at the presentation layer. For example, when logging on to bank account sites the presentation layer will decrypt the data as it is received.[[1]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Network+_Guide_to_Networks-1) Another example is representing structure, which is normally standardized at this level, often by using [XML](https://en.wikipedia.org/wiki/XML). As well as simple pieces of data, like strings, more complicated things are standardized in this layer. Two common examples are 'objects' in [object-oriented programming](https://en.wikipedia.org/wiki/Object-oriented_programming), and the exact way that streaming [video](https://en.wikipedia.org/wiki/Video) is transmitted.

In many widely used applications and protocols, no distinction is made between the presentation and application layers. For example, [HyperText Transfer Protocol](https://en.wikipedia.org/wiki/HyperText_Transfer_Protocol) (HTTP), generally regarded as an application-layer protocol, has presentation-layer aspects such as the ability to identify [character encoding](https://en.wikipedia.org/wiki/Character_encoding) for proper conversion, which is then done in the application layer.

Within the service layering semantics of the OSI network architecture, the presentation layer responds to service requests from the application layer and issues service requests to the session layer.

In the OSI model: the presentation layer ensures the information that the application layer of one system sends out is readable by the application layer of another system. For example, a PC program communicates with another computer, one using extended binary coded decimal interchange code (EBCDIC) and the other using ASCII to represent the same characters. If necessary, the presentation layer might be able to translate between multiple data formats by using a common format.

**Services**

* [Data conversion](https://en.wikipedia.org/wiki/Data_conversion)[[2]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Microsoft_Technet-2)
* [Character code translation](https://en.wikipedia.org/wiki/Character_encoding#Character_encoding_translation)[[2]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Microsoft_Technet-2)
* [Compression](https://en.wikipedia.org/wiki/Data_compression)[[2]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Microsoft_Technet-2)
* [Encryption and Decryption](https://en.wikipedia.org/wiki/Encryption)[[2]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Microsoft_Technet-2)

**Sublayers**

The presentation layer can be composed of two sublayers: common application service element (CASE) and specific application service element (SASE).[[5]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Hura-5)

**CASE**

The common application service element sublayer provides services for the application layer and request services from the session layer. It provides support for common application services, such as:

* ACSE ([Association Control Service Element](https://en.wikipedia.org/wiki/Association_Control_Service_Element))[[5]](https://en.wikipedia.org/wiki/Presentation_layer#cite_note-Hura-5)
* ROSE (Remote Operation Service Element)
* CCR (Commitment Concurrency and Recovery)
* RTSE (Reliable Transfer Service Element)

**SASE**

The specific application service element sublayer provides application specific services (protocols), such as

* FTAM (File Transfer, Access and Manager)
* VT (Virtual Terminal)
* MOTIS (Message Oriented Text Interchange Standard)
* CMIP (Common Management Information Protocol)
* JTM (Job Transfer and Manipulation) [a former OSI standard](http://www.furniss.co.uk/jtm/index.html)
* MMS (Manufacturing Messaging Service)
* RDA (Remote Database Access)
* DTP (Distributed Transaction Processing)

**Protocols**

Other protocols sometimes considered at this level (though perhaps not strictly adhering to the OSI model) include:

* [Apple Filing Protocol](https://en.wikipedia.org/wiki/Apple_Filing_Protocol) (AFP)
* [Independent Computing Architecture](https://en.wikipedia.org/wiki/Independent_Computing_Architecture) (ICA), the Citrix system core protocol
* [Lightweight Presentation Protocol](https://en.wikipedia.org/wiki/Lightweight_Presentation_Protocol) (LPP)
* [NetWare Core Protocol](https://en.wikipedia.org/wiki/NetWare_Core_Protocol) (NCP)
* [Network Data Representation](https://en.wikipedia.org/wiki/Network_Data_Representation) (NDR)
* [Telnet](https://en.wikipedia.org/wiki/Telnet) (a remote terminal access protocol)
* [Tox](https://en.wikipedia.org/wiki/Tox_(protocol)), The Tox protocol is sometimes regarded as part of both the presentation and application layer
* [eXternal Data Representation](https://en.wikipedia.org/wiki/External_Data_Representation) (XDR)
* X.25 [Packet Assembler/Disassembler Protocol](https://en.wikipedia.org/wiki/X.25) (PAD)

**References**

 *Dean, Tamara (2010).* [*Network+ Guide to Networks*](https://books.google.com/books?id=UD0h_GqgbHgC&printsec=frontcover&dq=network%2B+guide+to+networks&src=bmrr#v=onepage&q&f=false)*. Delmar. pp. 44–47.*

  [Microsoft TechNet](https://technet.microsoft.com/en-us/library/cc959885.aspx)

  *Grigonis, Richard (2000).* [*Computer telephony encyclopedia*](https://books.google.com/books?id=cUYk0ZhOxpEC&printsec=frontcover&dq=computer+telephony+encyclopedia#v=onepage&q&f=false)*. CMP. p. 331.*

  <http://www.linfo.org/presentation_layer.html> Linux Information Project

 *Hura, Gurdeep (2001). "Application Layer".* [*Data and Computer Communications: Networking and Internetworking*](https://archive.org/details/datacomputercomm0000hura)*. CRC Press LLC. pp.*[*710*](https://archive.org/details/datacomputercomm0000hura/page/710)*–712.*