**Network layer**

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In the seven-layer [OSI model](https://en.wikipedia.org/wiki/OSI_model) of [computer networking](https://en.wikipedia.org/wiki/Computer_networking), the **network layer** is **layer 3**. The network layer is responsible for [packet forwarding](https://en.wikipedia.org/wiki/Packet_forwarding) including [routing](https://en.wikipedia.org/wiki/Routing) through intermediate [routers](https://en.wikipedia.org/wiki/Router_(computing)).[[1]](https://en.wikipedia.org/wiki/Network_layer#cite_note-1)



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**Functions**

The network layer provides the means of transferring variable-length [network packets](https://en.wikipedia.org/wiki/Network_packet) from a source to a destination [host](https://en.wikipedia.org/wiki/Host_(network)) via one or more networks. Within the service layering semantics of the OSI network architecture, the network layer responds to service requests from the [transport layer](https://en.wikipedia.org/wiki/Transport_layer) and issues service requests to the [data link layer](https://en.wikipedia.org/wiki/Data_link_layer).

Functions of the network layer include:

[Connectionless communication](https://en.wikipedia.org/wiki/Connectionless_communication)

For example, [IP](https://en.wikipedia.org/wiki/Internet_Protocol) is connectionless, in that a data packet can travel from a sender to a recipient without the recipient having to send an acknowledgement. Connection-oriented protocols exist at other, higher layers of the OSI model.

Host addressing

Every host in the network must have a unique address that determines where it is. This address is normally assigned from a hierarchical system. For example, you can be :

"Fred Murphy" to people in your house,

"Fred Murphy, 1 Main Street" to Dubliners,

"Fred Murphy, 1 Main Street, Dublin" to people in Ireland,

"Fred Murphy, 1 Main Street, Dublin, Ireland" to people anywhere in the world.

On the Internet, addresses are known as [IP addresses](https://en.wikipedia.org/wiki/IP_address) (Internet Protocol).

Message forwarding

Since many networks are partitioned into subnetworks and connect to other networks for wide-area communications, networks use specialized hosts, called gateways or [routers](https://en.wikipedia.org/wiki/Router_(computing)), to forward packets between networks.

**Relation to TCP/IP model**

The [TCP/IP model](https://en.wikipedia.org/wiki/TCP/IP_model) describes the protocols used by the Internet.[[2]](https://en.wikipedia.org/wiki/Network_layer#cite_note-2) The TCP/IP model has a layer called the [Internet layer](https://en.wikipedia.org/wiki/Internet_layer), located above the [link layer](https://en.wikipedia.org/wiki/Link_layer). In many textbooks and other secondary references, the TCP/IP Internet layer is equated with the OSI network layer. However, this comparison is misleading, as the allowed characteristics of protocols (e.g., whether they are connection-oriented or connection-less) placed into these layers are different in the two models.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)] The TCP/IP Internet layer is in fact only a subset of functionality of the network layer. It describes only one type of network architecture, the Internet.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)]

**Protocols**

The following are examples of protocols operating at the network layer.

* CLNS, [Connectionless-mode Network Service](https://en.wikipedia.org/wiki/Connectionless-mode_Network_Service)
* DDP, [Datagram Delivery Protocol](https://en.wikipedia.org/wiki/Datagram_Delivery_Protocol)
* EGP, [Exterior Gateway Protocol](https://en.wikipedia.org/wiki/Exterior_Gateway_Protocol)
* EIGRP, [Enhanced Interior Gateway Routing Protocol](https://en.wikipedia.org/wiki/Enhanced_Interior_Gateway_Routing_Protocol)
* ICMP, [Internet Control Message Protocol](https://en.wikipedia.org/wiki/Internet_Control_Message_Protocol)
* IGMP, [Internet Group Management Protocol](https://en.wikipedia.org/wiki/Internet_Group_Management_Protocol)
* IPsec, [Internet Protocol Security](https://en.wikipedia.org/wiki/IPsec)
* IPv4/IPv6, [Internet Protocol](https://en.wikipedia.org/wiki/Internet_Protocol)
* IPX, [Internetwork Packet Exchange](https://en.wikipedia.org/wiki/Internetwork_Packet_Exchange)
* OSPF, [Open Shortest Path First](https://en.wikipedia.org/wiki/Open_Shortest_Path_First)
* PIM, [Protocol Independent Multicast](https://en.wikipedia.org/wiki/Protocol_Independent_Multicast)
* RIP, [Routing Information Protocol](https://en.wikipedia.org/wiki/Routing_Information_Protocol)
* WireGuard, [WireGuard](https://en.wikipedia.org/wiki/WireGuard)

**References**

 [*"Layer 3"*](http://searchunifiedcommunications.techtarget.com/definition/layer-3)*. techtarget.com. Retrieved 2017-05-11.*

* 1.  [RFC 1122](https://tools.ietf.org/html/rfc1122)
* *Tanenbaum, Andrew S. (2003).* [*Computer networks*](https://archive.org/details/computernetworks00tane_2)*.* [*Upper Saddle River, New Jersey*](https://en.wikipedia.org/wiki/Upper_Saddle_River,_New_Jersey)*:* [*Prentice Hall*](https://en.wikipedia.org/wiki/Prentice_Hall)*.* [*ISBN*](https://en.wikipedia.org/wiki/ISBN_(identifier))[*0-13-066102-3*](https://en.wikipedia.org/wiki/Special:BookSources/0-13-066102-3)*.*

**External links**

* [OSI Reference Model—The ISO Model of Architecture for Open Systems Interconnection](http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.136.9497&rep=rep1&type=pdf), Hubert Zimmermann, IEEE Transactions on Communications, vol. 28, no. 4, April 1980, pp. 425 – 432. (PDF-Datei; 776 kB)