
Overview Of Transmission Control Protocol And User Datagram Protocol

The internet as we know it plays a huge part in everyday life. Every business, school, company, and individual heavily relies on it for the work they do, or just for recreational activities. Most people don't fully understand how it all works though. It seems intimidating to take the time and fully grasp what's happening in between every link they click, or email a person sends, but if one takes the time to learn about what's going on behind the scenes they will gain an unfound appreciation of what's actually happening and not take everything we do on the internet for granted.

What is TCP/UDP?

TCP (Transmission Control Protocol) is a process that that establishes and maintains the connection in any given network. It allows the programs and applications we use on a day to day basis to exchange data with the users that are trying to reach what's needed. Combining this with internet protocol, we get the fundamentals of what we know as the internet. TCP is used for services that don't require a fast connection such as accessing the World Wide Web, sending and receiving emails, and doing file transfers. UDP (User Datagram Protocol) is an alternative method of communication to TCP. This is mainly used for applications that require a low-latency connection between each other. This includes things like online gaming, DNS, streaming online media like movies and videos, and Voice over IP.

How it works

While both protocols are used to send and receive packets of data, each of them works a little differently. Both of them send data that ends up resolving to an IP address, but they have different purposes that we use each of them for specifically. When you open your browser and attempt to connect to a web page, your pc starts to send TCP packets to the website's server address, requesting permission to view the web page. It then responds by sending yet another instance of TCP packets to your computer to which your web browser pieces all the information together and displays the website you're requesting access to. This happens for everything you do on a web page. Every link you click, or comment you post, is just a stream of these packets going back and forth between your computer and the website's server address. TCP is the more reliable option because of how it sends packets back and forth. Each packet is numbered, and sent in numerical order to guarantee that the recipient will receive all the information necessary. The user's computer will then respond to the server confirming that they've in fact received the

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message. If they don't get the right response they are looking for, the server will then respond once again with the same packets to make sure the user has gotten all the information they need.

Data sent through TCP are tracked as well, so no information gets corrupted while you're downloading a file. This is why when you download something from the internet it never gets corrupted or damaged because it's constantly checking the information being sent for errors, further increasing the reliability of this service. UDP takes away the error checking process while transferring packets, therefore making this service much faster. It also doesn't make sure that the user requesting the packets from the service they're trying to access is in fact receiving them like TCP does. For the most part, we would use UDP if we want to stream data as quickly as possible where small errors aren't critical to the end result.

4 Layers of TCP Protocol

There are 4 layers to the TCP/IP protocol. The application, transport, internet, and network access layers. The network access layer determines how the details of the data are actually being sent through a network. This includes how bits travel through the cables or wire we use. Layer two, the internet layer, packs the information into packets which are called IP datagrams. These contain information saying where the source and destination of these packets are going to and coming from. The third layer's main function is to tell the data's source where to send these packets and keeps track of the status of data being sent to a connection. The final layer, application layer, includes the more advanced protocols like DNS, HTTP, FTP, DHCP, and more. Together these four layers define how data is sent between two connections.

Conclusion

Many people don't fully understand the operations that happen in the background of the internet, and a lot of people heavily depend on it for getting the things they do every day done. TCP includes the basic fundamentals of the services we use every day, and DCP takes care of the more advanced processes. Even if one isn't interested in internet and routing technologies, it would be greatly beneficial for them to do research and learn what happens behind the scenes. Only then, will they fully appreciate the services that everybody ends up taking for granted.

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