Repack and recap: solutions

# Section one TCP vs UDP

The TCP protocol is viewed as a reliable protocol for data transmission. This is because it keeps track of the number of packets that have arrived and requests any missing packets again.

The UDP protocol is viewed as unreliable because it does not request that any missing packets be resent.

**Question:** Give **two** examples of when the **TCP** protocol could be used

| Sending web pages, emails, or documents |
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**Question:** Give **two** examples of when the **UDP** protocol could be used

| Voice or video calls |
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# Section two Protocols

Protocols that deal directly with applications operate in the application layer. These protocols are:

* HTTP / HTTPS
* IMAP
* SMTP
* POP
* FTP

Other protocols used in networking are IP, ethernet, TCP, UDP, and WiFi.

**Question:** Which protocol(s) operate in the **transport layer**?

| TCP and UDP |
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**Question:** Which protocol(s) operate in the **internet layer**?

| IP |
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**Question:** Which protocol(s) operate in the **link layer**?

| Ethernet and WiFi |
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# Section three Layers

The **application layer** deals with preparing data for sending. It also decodes data received so that it can be viewed by the end user. The application layer is used by applications, such as the web browser.

**Question:** Describe the role and purpose of the **transport layer**?

| The transport layer checks if the data needs to be broken down into segments. If so, it performs this operation. Once the data has been divided into segments, a header is added with information about the protocol used (either TCP or UDP) and the sender and receiver port numbers. |
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**Question:** Describe the role and purpose of the **internet layer**?

| The internet layer deals with the IP protocol. It uses this to create IP packets from the data passed into it from the transport layer. The IP packet has a header that lists the sender and receiver IP addresses. |
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**Question:** Describe the role and purpose of the **link layer**?

| The link layer deals with the physical transmission of the data. It creates frames from the IP packets passed to it from the internet layer. These frames include a header that lists the protocol used for the technology that is used from the current node to the next node on the network. It also lists the destination MAC address. |
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# Explorer task Routing tables

Routing tables were used to help with the transmission of packets around the network. Based on your experience with Packet tracer and the unplugged activity from this lesson, describe the role and function of routing tables.

You can use your own knowledge or complete some research to further explain your answer. The [A-Level packet switching section](https://isaaccomputerscience.org/concepts/net_internet_structure?examBoard=all&stage=all) (ncce.io/net-packet-switching) of the Isaac Computer Science page is a good place to start.

| Each router in the network has a dedicated routing table. The routing table lists known networks. Routes are carefully planned out using routing protocols. A routing table will list the IP address and the ‘next hop’ required for the packet to reach its final destination. These hops can change periodically based on network traffic. |
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