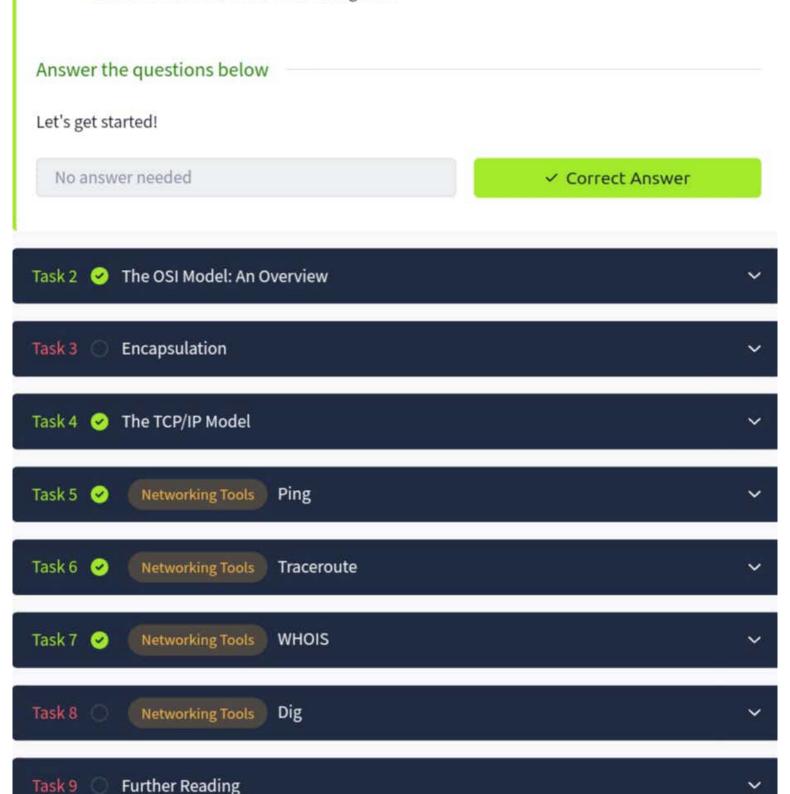
The aim of this room is to provide a beginner's introduction to the basic principles of networking. Networking is a *massive* topic, so this really will just be a brief overview; however, it will hopefully give you some foundational knowledge of the topic, which you can build upon for yourself.

The topics that we're going to cover in this room are:

- The OSI Model
- The TCP/IP Model
- · How these models look in practice
- · An introduction to basic networking tools



The physical layer is right down to the hardware of the computer. This is where the electrical pulses that make up data transfer over a network are sent and received. It's the job of the physical layer to convert the binary data of the transmission into signals and transmit them across the network, as well as receiving incoming signals and converting them back into binary For the "Which Layer" Questions below, answer using the layer number (1-7) Answer the questions below Which layer would choose to send data over TCP or UDP? Correct Answer Which layer checks received information to make sure that it hasn't been corrupted? ✓ Correct Answer In which layer would data be formatted in preparation for transmission? ✓ Correct Answer Which layer transmits and receives data? Correct Answer Which layer encrypts, compresses, or otherwise transforms the initial data to give it a standardised format? 6 ✓ Correct Answer Which layer tracks communications between the host and receiving computers? Correct Answer Which layer accepts communication requests from applications? ✓ Correct Answer Which layer handles logical addressing? ✓ Correct Answer When sending data over TCP, what would you call the "bite-sized" pieces of data? Segments ✓ Correct Answer [Research] Which layer would the FTP protocol communicate with? Q Hint ✓ Correct Answer Which transport layer protocol would be best suited to transmit a live video? UDP ✓ Correct Answer

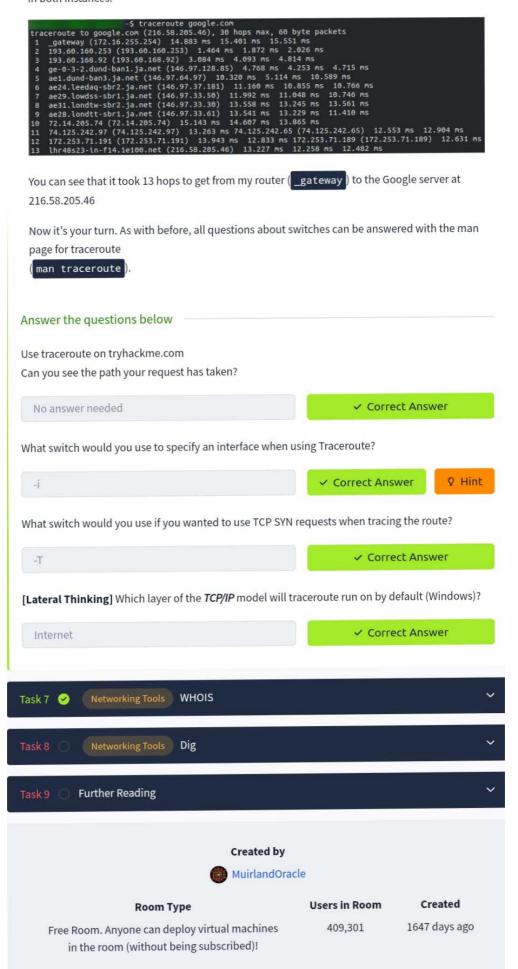
International Organisation for Standardisation (ISO); however, it's mainly used as a more comprehensive guide for learning, as the TCP/IP model is still the standard upon which modern networking is based. Answer the questions below Which model was introduced first, OSI or TCP/IP? TCP/IP ✓ Correct Answer Which layer of the TCP/IP model covers the functionality of the Transport layer of the OSI model (Full Name)? Transport ✓ Correct Answer Which layer of the TCP/IP model covers the functionality of the Session layer of the OSI model (Full Name)? Application ✓ Correct Answer The Network Interface layer of the TCP/IP model covers the functionality of two layers in the OSI model. These layers are Data Link, and?.. (Full Name)? Physical ✓ Correct Answer Which layer of the TCP/IP model handles the functionality of the OSI network layer? Internet ✓ Correct Answer What kind of protocol is TCP? Connection-based ✓ Correct Answer ♀ Hint What is SYN short for? ✓ Correct Answer ♀ Hint Synchronise What is the second step of the three way handshake? SYN/ACK Correct Answer What is the short name for the "Acknowledgement" segment in the three-way handshake? ACK ✓ Correct Answer Task 5 🕝 Task 6 🕝 Traceroute Task 7 🔗 WHOIS Dig **Further Reading** 

This sorted out the inconsistency problems. Later the OSI model was also introduced by the

possible. Usually this will be a website on the internet, but it could also be for a computer on your home network if you want to check if it's configured correctly. Ping works using the ICMP protocol, which is one of the slightly less well-known TCP/IP protocols that were mentioned earlier. The ICMP protocol works on the Network layer of the OSI Model, and thus the Internet layer of the TCP/IP model. The basic syntax for ping is ping <target>. In this example we are using ping to test whether a network connection to Google is possible: \$ ping google.com PING google.com (216.58.198.174) 56(84) bytes of data. Notice that the ping command actually returned the IP address for the Google server that it connected to, rather than the URL that was requested. This is a handy secondary application for ping, as it can be used to determine the IP address of the server hosting a website. One of the big advantages of ping is that it's pretty much ubiquitous to any network enabled device. All operating systems support it out of the box, and even most embedded devices can use ping! Have a go at the following questions. Any questions about syntax can be answered using the man page for ping (man ping on Linux). Answer the questions below What command would you use to ping the bbc.co.uk website? ping bbc.co.uk ✓ Correct Answer Ping muirlandoracle.co.uk What is the IPv4 address? 217.160.0.152 Correct Answer 9 Hint What switch lets you change the interval of sent ping requests? ✓ Correct Answer ♀ Hint What switch would allow you to restrict requests to IPv4? ✓ Correct Answer What switch would give you a more verbose output? ✓ Correct Answer Task 6 🕝 Traceroute Task 7 🔗 WHOIS Dig **Further Reading** Created by MuirlandOracle **Room Type Users in Room** Created Free Room. Anyone can deploy virtual machines 409,301 1647 days ago in the room (without being subscribed)!

The internet is made up of many, many different servers and end-points, all networked up to each other. This means that, in order to get to the content you actually want, you first need to go through a bunch of other servers. Traceroute allows you to see each of these connections -- it allows you to see every intermediate step between your computer and the resource that you requested. The basic syntax for traceroute on Linux is this: traceroute <destination>

By default, the Windows traceroute utility (tracert) operates using the same ICMP protocol that ping utilises, and the Unix equivalent operates over <u>UDP</u>. This can be altered with switches in both instances.



This is comparatively a very small amount of information as can often be found. Notice that we've got the domain name, the company that registered the domain, the last renewal, and when it's next due, and a bunch of information about nameservers (which we'll look at in the next task). Your Turn Answer the questions below Perform a whois search on facebook.com No answer needed ✓ Correct Answer What is the registrant postal code for facebook.com? 94025 ✓ Correct Answer When was the facebook.com domain first registered (Format: DD/MM/YYYY)? 29/03/1997 ✓ Correct Answer Perform a whois search on microsoft.com (Note: Please ensure you have read the task above before attempting the next questions.) No answer needed Correct Answer Which city is the registrant based in? Redmond ✓ Correct Answer [OSINT] What is the name of the golf course that is near the registrant address for microsoft.com? Bellevue Golf Course ✓ Correct Answer What is the registered Tech Email for microsoft.com? msnhst@microsoft.com ✓ Correct Answer Networking Tools Dig **Further Reading** Created by MuirlandOracle **Room Type Users in Room** Created Free Room. Anyone can deploy virtual machines 409,301 1647 days ago in the room (without being subscribed)!