Lab 3

1. Install wireshark

2. Capture packets using wireshark

3. Draw an IP header.

4. Explain the fields for a particular IP packet captured. Try to explain the purpose of each field.

5. Here you find a network trace with fragment bit set in the IP packets. What’s the major difference from the packet you described for answering previous questions.

https://wiki.wireshark.org/SampleCaptures?action=AttachFile&do=get&target=ipv4frags.pcap

6. List three games you like and list their technical/design highlights.

7. List the names of applications/services you like (up to 20 names).

Answers:

3.

Header:

|  |  |  |  |
| --- | --- | --- | --- |
| Version  4 | Header Length  20 Bytes | Type of Service  IPv4 / 0xc0 | Total Length  532 |
| Identification  0x0000 (0) | | IP Flags  0x00 | Fragment Offset  0 |
| Time to Live  2 | Protocol  UDP (17) | Header Checksum  0xb582[validation disabled] | |
| Source Address  149.153.106.254 | | | |
| Destination Address  255.255.255.255 | | | |
| IP Option | | | |

4.

* Version: Allows for version identification. 4 bit field.
* Header Length: 4 bits in size. Shows how many 32-bit words are present in header.
* Type of Service: Specifies what service is provided. Quality of service for data streaming.
* Total Length: Total length of header in bytes
* Identification: Allows for identification of fragments of IP.
* IP Flags: Helps with control and identification of fragments. It is a 3 bit field.
* Fragment Offset: Number of data bytes ahead of a fragment in data.
* Time to Live: 2 Time to live dictates when a packet will be dropped and then an ICMP time exceeded message is sent to a sender. Time to Live is decremented by 1 everytime it passes through a router.
* Protocol: Specifies the IP protocol used by the header.
* Header Checksum: Allows to check header for errors.
* Source Address: 149.153.106.254 the 32-bit source IP address
* Destination Address: 255.255.255.255 the 32-bit destination IP address

5.

6. Mass Effect 2 , Outer Wilds, God of War

* Mass Effect 2

Mass Effect 2 released in 2010. It is an action role-playing game developed by BioWare. It is the second instalment in the Mass Effect series.

One of Mass Effect 2s many technical and design highlights is how well it blends a story driven roleplaying game and an action packed third-person shooter. The story and characters are crafted incredibly well and each character has their own story and goal. The story unravels and pushes the world building to new levels and allows the player to take part in really good gameplay at the same time.

The game offers an incredible amount of freedom in the order in which the player wants to approach the story, alongside this it allows the player to choose between dialogue options to suit their own roleplaying desires.

* Outer Wilds

Outer Wilds released in 2019. It is an action-adventure game developed by Mobius Digital. It is a game that originally started as a college project and developed over the years into a full game release.

It is a game that is designed around exploration. Physics, music, exploration and time management play a massive part in the experience. One of the many highlights of this game is the technical use of physics and the way the world is created. The player is able to fly in a spaceship from planet to planet. These planets are all very small in size and are traversable by foot. They all have their own special thing about them and each has a different gravity field and story behind it. From a planet that is actively being destroyed more and more as the game progresses to a twin set of planets that exchange sand between each other as the game progresses.

Another interesting game design of this game is a 22 minute time loop which occurs in the game and is the main driving force from the story.

Th final interesting design choice in my opinion is the fact that the game can be completed within minutes of first starting it up. Everything is accessible to the player at all times but only through exploration of the world the player learns how to do these things and get to certain places.

* God of War (2018)

God of War released in 2018 on PlayStation and was later re-released in 2022 for PC. It is an action-adventure game developed by Santa Monica Studio.

It is the fourth instalment in the God of War series.

The games Combat is both a technical and design achievement. It is satisfying, rewarding and has incredible weight to it. Axe throws feels like actual axe throws and each hit feels powerful.

This game also has a lot of focus on the Story and the player experience of this world. The design of the world is immersive and captivating. The character and world building is done with great care and attention to detail.

7.

* Discord
* Instagram
* Steam
* YouTube
* Reddit
* Amazon
* Prime Video
* Disney +
* Netflix
* Google
* TikTok
* Just Eat
* Revolut
* Shazam
* Google Maps
* Snapchat
* GoG
* Origin
* Ubisoft Connect