

Emerson Fleming

CPE 400.1001

10-18-2023

## PROJECT PROGRESS: MEASURING TCP/UDP CONNECTIONS ON MODERN GAME CONSOLES

### **PROGRESS:**

I have decided to pivot my original project idea from collecting data on game controllers to collecting data transmitted on different modern game consoles. For my progress on this front, I have been able to collect some data from a Playstation 5 and an Xbox Series X. What I did to collect this data is I ran Wireshark and filtered the captured packets by the IP addresses of the specific consoles. Then, to better organize this data, I wrote a Python script that sends the data into a CSV file and organizes it by the data collected (IP addresses, source or destination, TCP or UDP, etc.).

There have been a few snags that I have run into. For one, I want to collect data on the Nintendo Switch, however it looks like Nintendo is using a system to block regular packets from being tracked on Wireshark and other sniffers, so I will need to find a workaround in order to gather this data. That leads into the rest of my issues, wherein I am not positive what type of data is being blocked on the Playstation and Xbox respectively. Since the Switch is blocking this IP data, I would imagine that the Playstation and Xbox are hiding some data from the sniffers as well. Once I figure out the workaround for the Switch, I will apply it to the other systems and collect data from there.

As far as what I plan to do to go forward and complete this project, I want to get a Raspberry Pi and run Wireshark on these devices for a full day and compare which system has the most communications across TCP/UDP. My further coding implementations will likely come from trying to find a workaround to the Nintendo Switch and the other systems.

**DATA AND CODE ON SUBSEQUENT PAGES**

**CODE:**

```
#Name: Emerson Fleming
#Class: CPE 400 Section 1001
#Date: 10-18-2023
#Assignment: Project Progress Submission
```

```
import pyshark
import csv
import argparse
```

```
def save_packet_data_to_csv(capture_file, csv_file, ip_address):
    with open(csv_file, 'a', newline='') as csvfile:
        csv_writer = csv.writer(csvfile)

        # Write the header row
        csv_writer.writerow(['Time', 'Source IP', 'Destination IP', 'Protocol', 'Length'])

        cap = pyshark.FileCapture(capture_file)

        for packet in cap:
            try:
                src_ip = packet.ip.src
                dst_ip = packet.ip.dst

                # Check if the provided IP address is either the source or destination IP
                if ip_address == src_ip or ip_address == dst_ip:
                    time = packet.sniff_time
                    protocol = packet.transport_layer
                    length = packet.length

                    # Determine whether the IP address is the source or destination
                    if ip_address == src_ip:
                        direction = 'Source'
                    else:
                        direction = 'Destination'

                    # Write the data to the CSV file
                    csv_writer.writerow([time, src_ip, dst_ip, protocol, length, direction])

            except AttributeError:
                # Handle packets without the expected attributes
                pass
```

```
if __name__ == "__main__":
    parser = argparse.ArgumentParser(description='Capture Wireshark data and save to CSV,
filtering by IP address.')
    parser.add_argument('capture_file', type=str, help='Path to the Wireshark capture file (PCAP
or PCAPNG).')
    parser.add_argument('csv_file', type=str, help='Path to the CSV file where data will be saved.')
    parser.add_argument('ip_address', type=str, help='IP address to filter the data by.')

    args = parser.parse_args()

    save_packet_data_to_csv(args.capture_file, args.csv_file, args.ip_address)
    print(f'Data from {args.capture_file} for IP {args.ip_address} has been saved to
{args.csv_file}')
```

## CSV DATA:

### *Playstation 5:*

Time	IP Address	Direction	Protocol	Length	
2023-10-18 16:34:11.966582	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:34:27.962178	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:34:50.720685	192.168.1.146	Source		46	Source
2023-10-18 16:34:51.205657	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:34:51.382750	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:34:51.752096	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:34:51.878207	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:34:53.013259	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:34:55.032539	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:34:57.561858	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:34:59.018987	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:35:06.978271	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:35:23.596545	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:07.715066	192.168.1.146	Source		46	Source
2023-10-18 16:36:08.244010	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:36:08.430795	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:36:08.761258	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:36:08.922482	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:09.983174	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:10.925392	192.168.1.146	Source	UDP	179	Source
2023-10-18 16:36:11.416481	192.168.1.146	Source	UDP	179	Source
2023-10-18 16:36:12.235145	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:26.777025	192.168.1.146	Source		46	Source
2023-10-18 16:36:27.194331	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:36:27.482945	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:36:27.851192	192.168.1.146	Source	UDP	152	Source
2023-10-18 16:36:27.950007	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:28.950649	192.168.1.146	Source	UDP	179	Source
2023-10-18 16:36:29.054786	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:29.181849	192.168.1.146	Source	UDP	179	Source
2023-10-18 16:36:31.057938	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:35.125308	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:43.161721	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:36:57.526189	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:36:59.065320	192.168.1.146	Source	UDP	313	Source

2023-10-18 16:37:31.212667	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:38:35.652732	192.168.1.146	Source	UDP	313	Source
2023-10-18 16:38:57.710593	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:40:57.282965	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:40:59.312962	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:02.531999	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:04.296688	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:06.208880	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:08.228661	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:10.292644	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:12.340794	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:14.436792	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:16.253022	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:18.287553	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:20.270410	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:22.278763	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:24.389276	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:26.304877	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:28.319737	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:30.278328	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:32.250416	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:34.263867	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:36.328057	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:38.235778	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:40.619105	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:42.207365	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:44.304541	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:46.243503	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:48.323796	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:50.331404	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:52.293242	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:54.257309	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:41:56.246266	192.168.1.146	Source	UDP	218	Source
2023-10-18 16:42:57.814030	192.168.1.146	Source	UDP	218	Source
Time	Source IP	Destination IP	Protocol	Length	
2023-10-18 14:00:17.672440	192.168.1.146	224.0.0.251		46	Source
2023-10-18 14:00:51.824109	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 14:01:11.565398	192.168.1.146	224.0.0.251	UDP	218	Source

2023-10-18 14:02:20.075893	192.168.1.146	239.255.255.250		46	Source
2023-10-18 14:02:20.075894	192.168.1.146	239.255.255.250	UDP	167	Source
2023-10-18 14:02:20.110869	192.168.1.146	239.255.255.250	UDP	167	Source
2023-10-18 14:02:20.123977	192.168.1.146	239.255.255.250	UDP	167	Source
2023-10-18 14:02:24.981507	192.168.1.146	239.255.255.250		46	Source
2023-10-18 14:02:51.915677	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 14:03:07.682193	192.168.1.146	239.255.255.250	UDP	480	Source
2023-10-18 14:03:07.682194	192.168.1.146	239.255.255.250	UDP	489	Source
2023-10-18 14:03:07.682195	192.168.1.146	239.255.255.250	UDP	528	Source
2023-10-18 14:03:07.682195	192.168.1.146	239.255.255.250	UDP	522	Source
2023-10-18 14:03:07.728072	192.168.1.146	239.255.255.250	UDP	480	Source
2023-10-18 14:03:07.728073	192.168.1.146	239.255.255.250	UDP	489	Source
2023-10-18 14:03:07.728074	192.168.1.146	239.255.255.250	UDP	528	Source
2023-10-18 14:03:07.728075	192.168.1.146	239.255.255.250	UDP	522	Source
2023-10-18 14:03:07.728075	192.168.1.146	224.0.0.2		46	Source
2023-10-18 14:03:11.591217	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 14:03:27.814760	192.168.1.146	239.255.255.250		46	Source
2023-10-18 14:03:28.162690	192.168.1.146	239.255.255.250	UDP	480	Source
2023-10-18 14:03:28.162691	192.168.1.146	239.255.255.250	UDP	489	Source
2023-10-18 14:03:28.162691	192.168.1.146	239.255.255.250	UDP	528	Source
2023-10-18 14:03:28.162691	192.168.1.146	239.255.255.250	UDP	522	Source
2023-10-18 14:03:28.162692	192.168.1.146	239.255.255.250	UDP	480	Source
2023-10-18 14:03:28.162692	192.168.1.146	239.255.255.250	UDP	489	Source
2023-10-18 14:03:28.162693	192.168.1.146	239.255.255.250	UDP	528	Source
2023-10-18 14:03:28.162693	192.168.1.146	239.255.255.250	UDP	522	Source
2023-10-18 14:03:28.162694	192.168.1.146	224.0.0.2		46	Source
Time	Source IP	Destination IP	Protocol	Length	
2023-10-18 16:19:34.842907	192.168.1.110	192.168.1.146	TCP	78	Destination
2023-10-18 16:19:34.861710	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 16:19:35.843427	192.168.1.110	192.168.1.146	TCP	78	Destination
2023-10-18 16:19:35.851556	192.168.1.146	192.168.1.110	TCP	74	Source
2023-10-18 16:19:35.851558	192.168.1.146	192.168.1.110	TCP	74	Source
2023-10-18 16:19:35.851709	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:19:35.851772	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:19:35.851877	192.168.1.110	192.168.1.146	TCP	311	Destination
2023-10-18 16:19:35.864129	192.168.1.146	192.168.1.110	TCP	74	Source
2023-10-18 16:19:35.864319	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:19:35.900333	192.168.1.146	192.168.1.110	TCP	615	Source

2023-10-18 16:19:35.900335	192.168.1.146	192.168.1.110	TCP	66	Source
2023-10-18 16:19:35.900471	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:19:35.900542	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:19:35.903605	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:19:35.917352	192.168.1.146	192.168.1.110	TCP	66	Source
2023-10-18 16:20:57.659531	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 16:24:57.543797	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 16:26:06.214798	192.168.1.110	192.168.1.146	TCP	78	Destination
2023-10-18 16:26:06.302859	192.168.1.146	192.168.1.110	TCP	74	Source
2023-10-18 16:26:06.303029	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:26:06.303165	192.168.1.110	192.168.1.146	TCP	311	Destination
2023-10-18 16:26:06.308465	192.168.1.146	224.0.0.251	UDP	118	Source
2023-10-18 16:26:06.349568	192.168.1.146	192.168.1.110	TCP	615	Source
2023-10-18 16:26:06.349660	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:26:06.354668	192.168.1.146	192.168.1.110	TCP	66	Source
2023-10-18 16:26:06.354730	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:26:06.355826	192.168.1.110	192.168.1.146	TCP	66	Destination
2023-10-18 16:26:06.365248	192.168.1.146	192.168.1.110	TCP	66	Source
2023-10-18 16:26:07.055979	192.168.1.146	224.0.0.251	UDP	118	Source
2023-10-18 16:26:57.596671	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 16:28:57.661662	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 16:29:23.455303	192.168.1.146	224.0.0.251		46	Source
2023-10-18 16:30:57.666303	192.168.1.146	224.0.0.251	UDP	218	Source
2023-10-18 16:31:30.641812	192.168.1.146	224.0.0.251		46	Source

### *Xbox Data:*

Time	Source IP	Destination IP	Protocol	Length	
2023-10-18 19:13:41.864248	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:13:42.501024	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:42.504428	192.168.1.14	192.168.1.75	TCP	74	Source
2023-10-18 19:13:42.504678	192.168.1.75	192.168.1.14	TCP	66	Destination
2023-10-18 19:13:42.505096	192.168.1.75	192.168.1.14	TCP	391	Destination
2023-10-18 19:13:42.514466	192.168.1.14	192.168.1.75	TCP	356	Source
2023-10-18 19:13:42.514467	192.168.1.14	192.168.1.75	TCP	1123	Source
2023-10-18 19:13:42.514714	192.168.1.75	192.168.1.14	TCP	66	Destination
2023-10-18 19:13:42.979246	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:13:43.967545	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:13:44.777144	192.168.1.14	192.168.1.75	UDP	528	Source

2023-10-18 19:13:45.504012	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:46.503011	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:47.503153	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:48.503852	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:49.505039	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:50.506227	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:52.506971	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:55.506736	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:56.507844	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:57.508071	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:58.509197	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:13:59.509872	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:00.511078	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:02.511237	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:15.243208	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:16.244037	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:17.243856	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:18.245009	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:19.246198	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:20.247363	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:22.247937	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:27.753961	192.168.1.75	192.168.1.14	TCP	54	Destination
2023-10-18 19:14:27.764996	192.168.1.14	192.168.1.75	TCP	66	Source
2023-10-18 19:14:34.308370	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:35.308498	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:36.309295	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:37.309449	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:38.310130	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:38.850232	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:14:39.310456	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:14:41.311291	192.168.1.75	192.168.1.14	TCP	78	Destination
2023-10-18 19:15:12.811244	192.168.1.75	192.168.1.14	TCP	54	Destination
2023-10-18 19:15:12.816685	192.168.1.14	192.168.1.75	TCP	66	Source
2023-10-18 19:15:41.620421	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:15:42.935488	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:15:43.609798	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:15:44.901568	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:15:48.204878	192.168.1.14	192.168.1.75	TCP	54	Source



2023-10-18 19:16:39.187887	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:17:42.034060	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:17:42.819034	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:17:43.715274	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:17:44.733041	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:18:35.004878	192.168.1.14	239.255.255.250	UDP	179	Source
2023-10-18 19:18:39.190845	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:19:41.695923	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:19:42.572912	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:19:43.949881	192.168.1.14	192.168.1.75	UDP	528	Source
2023-10-18 19:19:44.570842	192.168.1.14	192.168.1.75	UDP	528	Source