

# Wireless communication lab

Lab report

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# Abstraction

- This two lab focus on wireless communication and analysis its behavior
- The wireless LAN setup utilizes the Infrastructure-mode of the 802.11b. Wireless LAN adapters in conjunction with a Linksys access point.
- One laptop will be stationary and other laptop will connect to that client. Use the DHCP dynamic host configuration protocol server provided by the access point, and the IP address will be dynamically allocated as done in home or public access wireless networks.
- Iperf is a tool for measuring the TCP and UDP bandwidth performance. The tool was developed at the NLANR national laboratory for Applied Network

# Background

- For UDP measurement, an Iperf client sends a constant bit rate stream to the Iperf server. Since it is pre-determined what the Iperf UDP client will send to the Iperf UDP server. The server is periodically report the number of datagram lost in the transmission.
- For TCP measurement, an Iperf TCP client connects to the Iperf server and the server attempts to send as much data as it can for a fixed time. Then

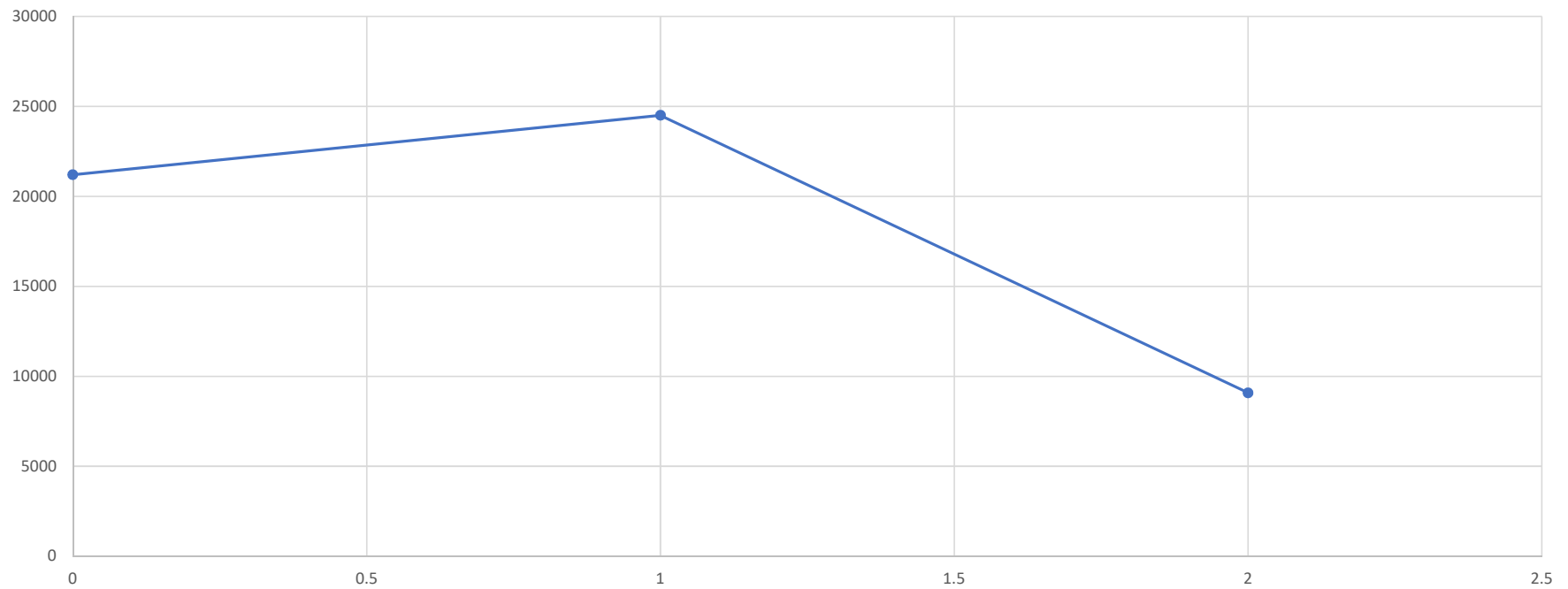
# TCP and UDP Throughput vs Signal strength

Location	Distance	Signal Strength	Noise Power	SNR	UDP	TCP	Observation
Wall 3704 entry	30ft	-38	-83	45	13500	13300	2datagrams received out of order
3428 main entry	60ft	-48	-82	34	14300	6100	1datagrams received out of order
3424 entry	90ft	-50	-87	37	7840	988	1datagrams received out of order

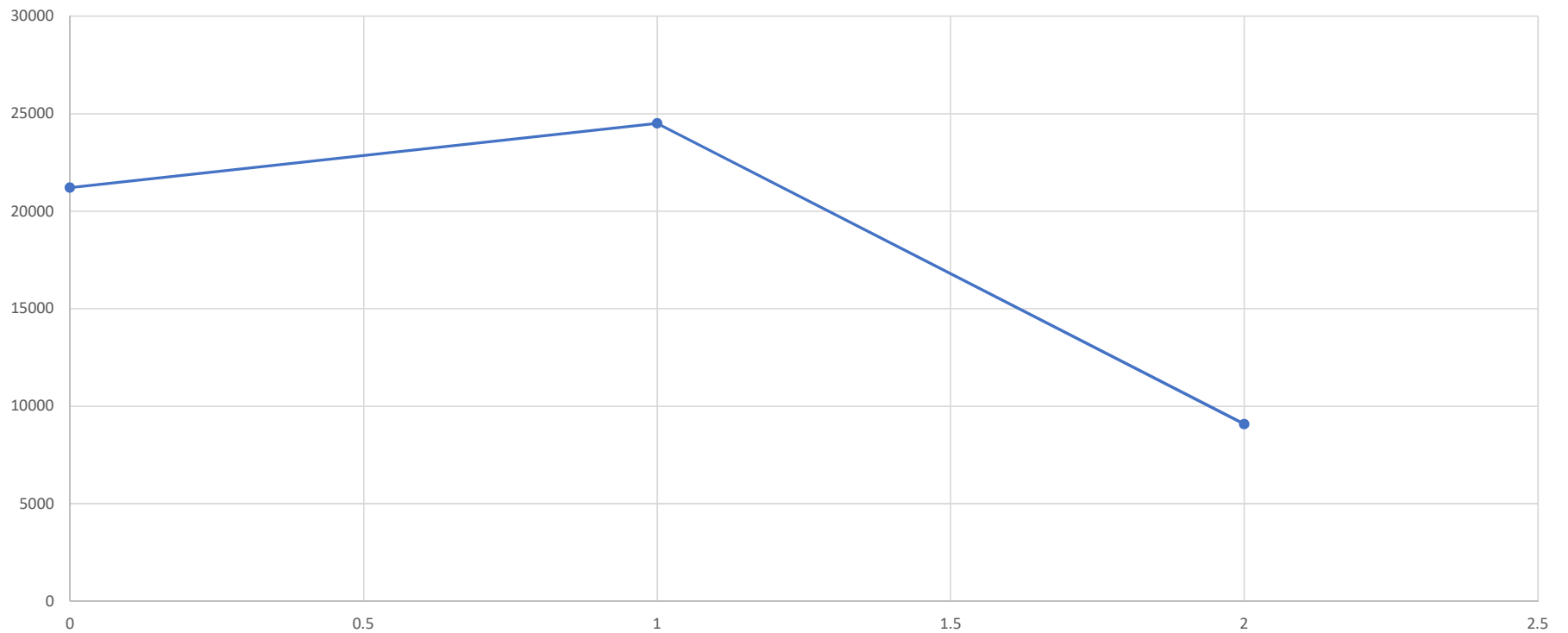
# Noise and Thought with Microwave Oven

Level	Signal Strength	Noise Power	UDP	TCP	Observation	Other
Off	-12	-80	21200	5750	Flat	1 datagram out of order
High	-12	-83	17100	2300	Slight bump	1 datagram out of order
Medium high	-14	-80	6550	11700	Slight bump	1 datagram out of order
Medium	-8	-80	5250	15300	Slight bump	1 datagram out of order
Defrost	-8	-80	9080	60500	Slight bump	1 datagram out of order
Warm	-12	-81	2450	14600	flat	1 datagram out of order

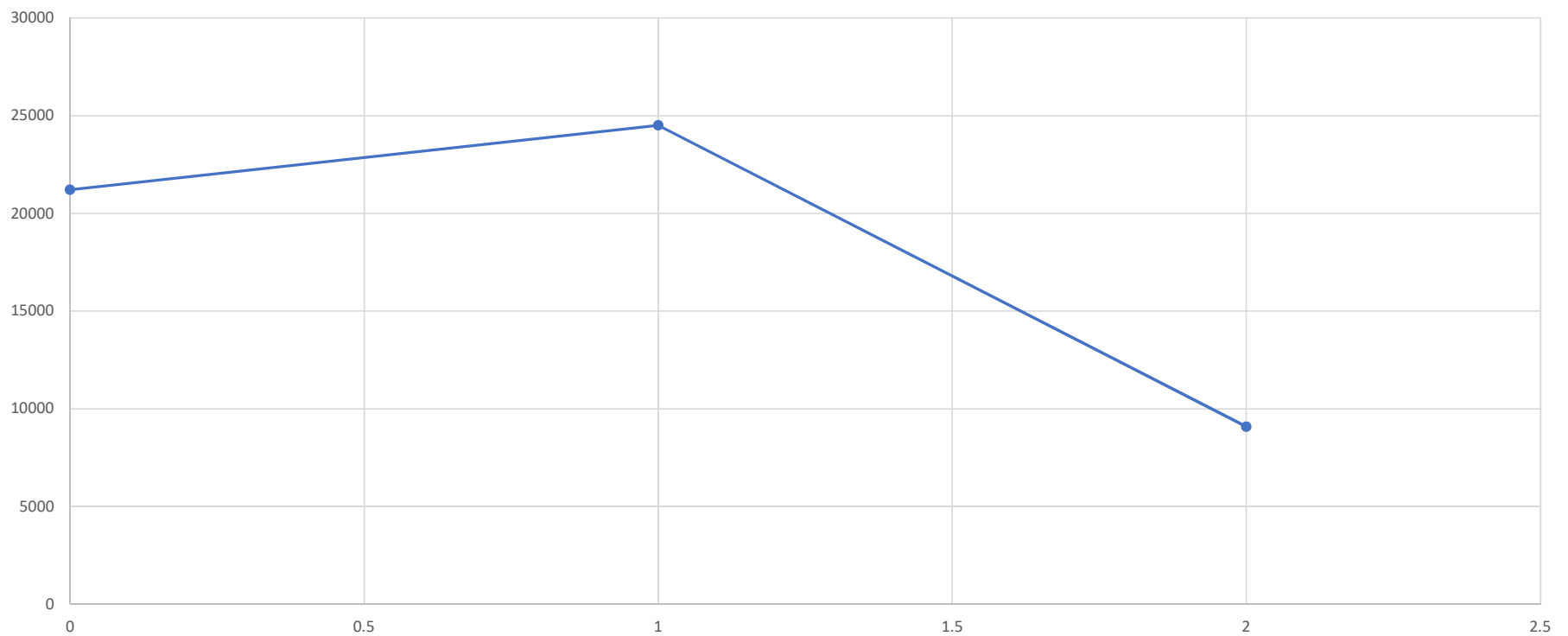
# Distance vs Signal Strength



# UDP Throughput vs signal to noise ratio

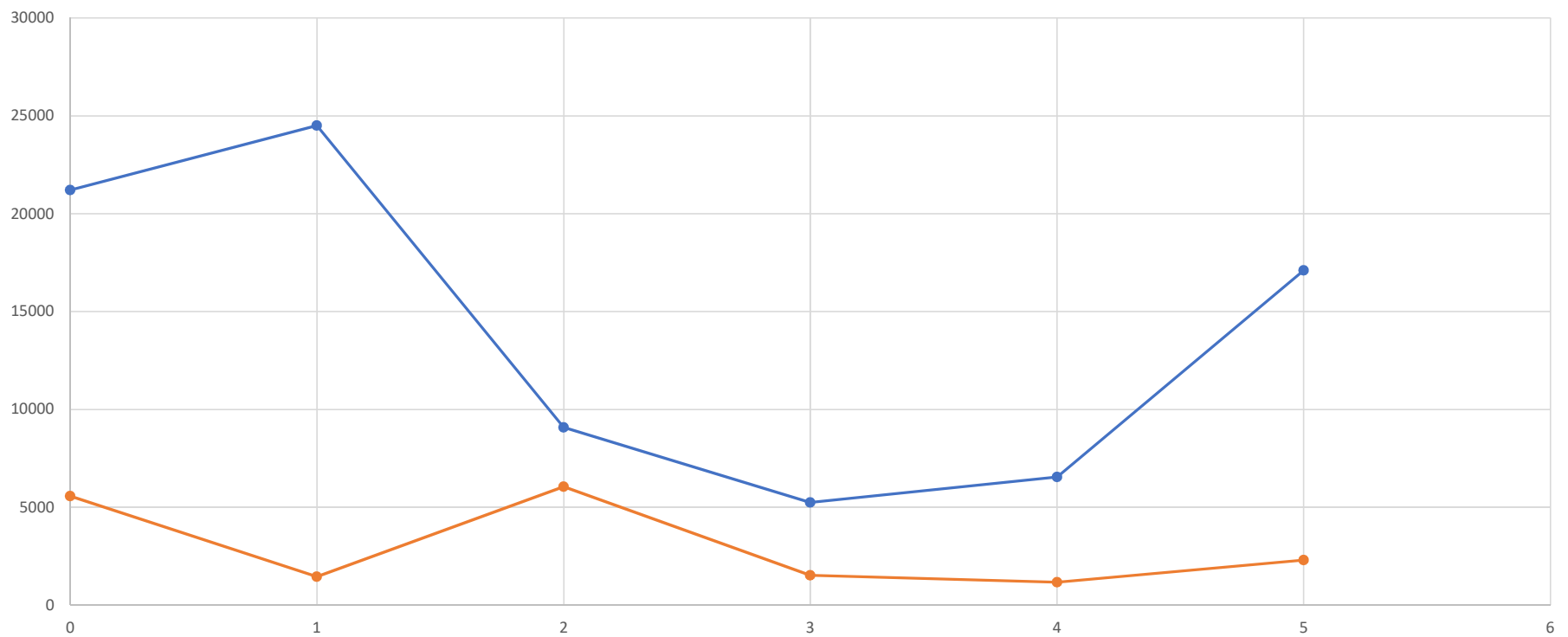


# TCP Throughput vs signal to noise ratio





# Throughput against microwave level



# Result

- Decreasing in the signal strength of any wireless LAN signal decreasing with the increasing in distance
- The stronger signal it is, the faster the data throughput for either of the transmission protocols will be
- More noise and interference from the microwave results in a significantly lower data throughput

# Lab data

Distance	Packet Type	Data Rate	Observation
10ft	DH1	190.284	Every 7 outputs rate drop
	DH3	208.114	Every 6 outputs rate drop
	DH5	264.081	Every 6 outputs rate drop
15ft	DH1	127.451	Took longer to start
	DH3	197.452	Every 6 outputs rate drop
	DH5	165.422	Every 3 outputs rate drop
30ft	DH1	120.184	Every 3 outputs rate drop
	DH3	59.508	Every 3 outputs rate drop
	DH5	85.583	Every 3 outputs rate drop

# Data Throughput vs # of slaves

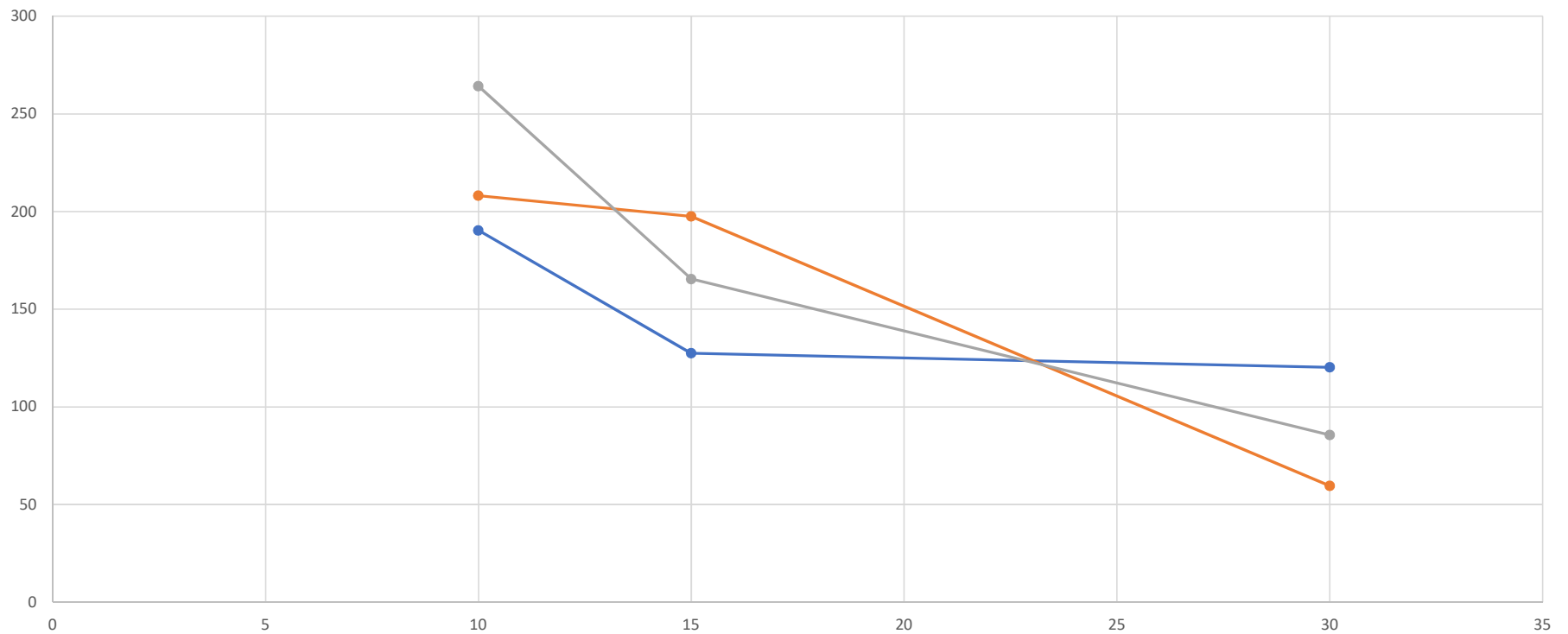
Number of Masters	Packet type	Data Rate
1	DH1	55.2
	DH3	83.7
	DH5	275
2	DH1	11.762
	DH3	47.6
	DH5	65.2
3	DH1	7.30
	DH3	30
	DH5	38.4

Measurement Case	Data Rate for each pair of connections
Before interference	170
3 Connections crossing	170-270
	85-270
	170-260

	Data Rate
Bluetooth Throughput	260
802.11b TCP Throughput	8.05

# Data Throughput vs Distance

## DH1 DH3 Dh5



# Result

- As the distance from the master source increases the overall data throughput decreases
- Data throughput values with Bluetooth are much lower than that of both UDP and TCP WLAN protocols
- The wave is not clear enough in the lab so the result might not be that accurate

# Conclusion

- The lab is focus on analysis different behavior of wireless communication. Also, compared the difference between UCP and TCP which is very important in study.
- We also discovered the facts like decreasing in the signal strength of any wireless LAN signal decreasing with the increasing in distance from the data
- We also conclude the DH1, DH3, DH5 has little difference behavior
- Also , the wifi is a more reliable way for wireless communication than the bluetooth