Artificial WiFi Packet Dataset For Modulation Recognition

Resources Used:

Purpose	Resource
Physical transmission / reception	USRP X310, B210
WiFi IQ Sample Generation	MATLAB Wireless Toolbox
Transmit / Receive IQ samples	UHD Sample Scripts
Experiment Management	OEDL
Experiment Location	ORBIT Grid

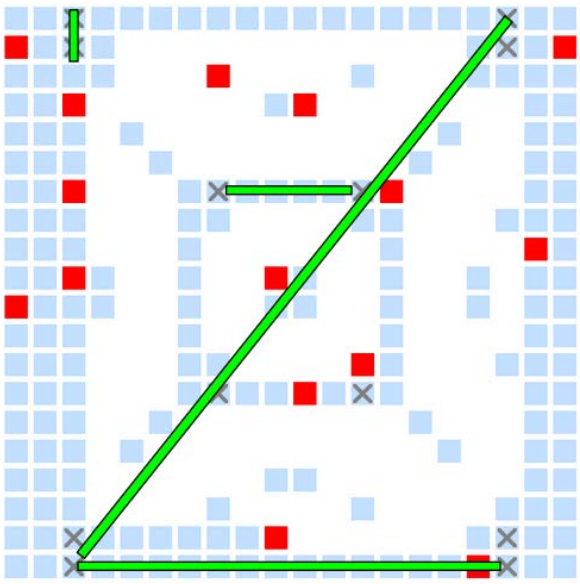
Constants:

Transmitter Bandwidth	20 Mhz
Receiver Sampling Rate	40 MSps
Input/Output Binary File Format	int16
Packet Payload Size	1500 Bytes
Samples	40M, 80M (when permitted) *

Variables:

Distance (ft)	3, 15, 45, 72
Frequency (Mhz)	2412, 2437, 2462, 5180, 5240, 5745, 5825
Modulation and Coding Scheme (MCS)	0, 1, 2, 3, 4, 5, 6, 7

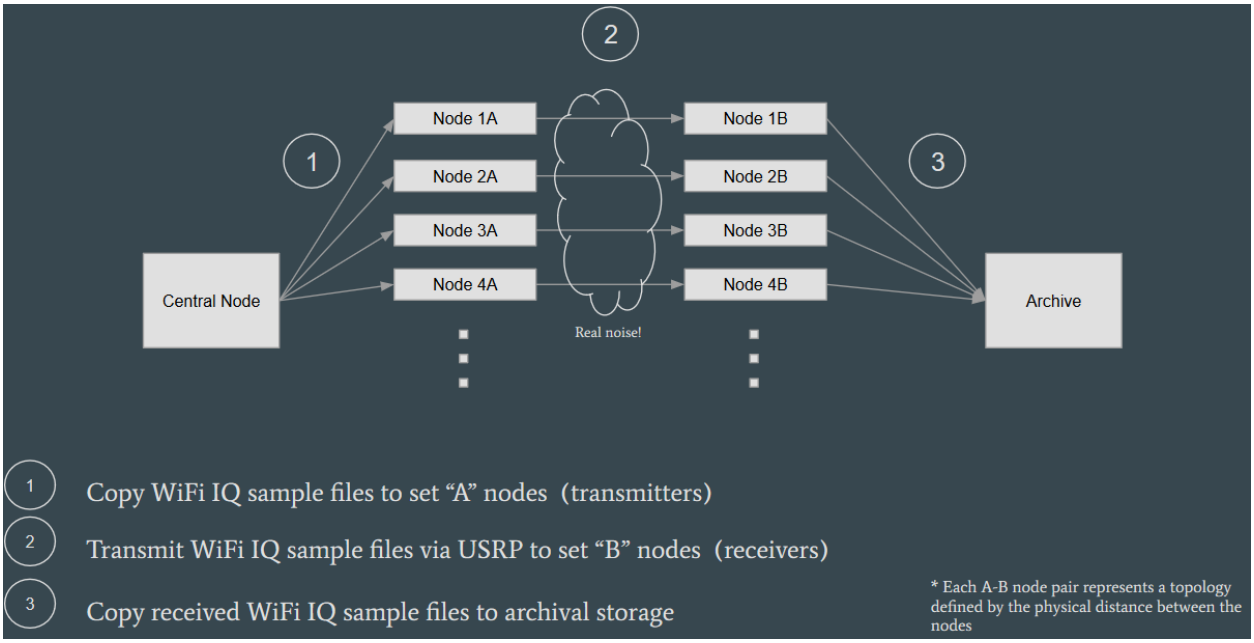
Layout



Each square with an “X” marks a node that we are using. Each green line represents a distance between nodes, the shortest being 3ft, largest 72ft.

*The USRP X310s do not have a buffer large enough to support a collection of 80M samples at 40Msps.

Data Collection Process



The source code for the automation script and WiFi IQ sample generation are located at https://www.orbit-lab.org/wiki/Other/Summer/2020/FPGAspectrum