

Wesley Johnson

Cyber/Infrastructure Defense

April 14, 2023

### DDoS Simulation Analysis

This assignment took me for a pretty interesting journey this past week. The initial start started off a little slow and sort of daunting. However, once I got a virtual machine up and running, things seemed to go a bit smoother. The TCL scripting language, I found myself adding bots until the cows came home. Surely enough, the cows came home and there I was, still adding bots trying to reach a degradation ratio that was even remotely acceptable. After many hours of tedious typing, I started to question if my efforts were really going to pay off. But alas, I came to the realization that my toil was not all in vain. That whole time I had been including in my calculations every intermediary hop between users and the web server. After refactoring my calculations, I had discovered that I only needed 20 bots to accomplish a DDoS attack with an overall degradation ratio of 96.4%.

Initially, given the topological configuration of the network, I determined bot positioning based on the intuitive assumption that flooding a bottleneck router would create the greatest impact using the least amount of nodes. I found that, with a total of 20 bots, a degradation ratio of up to 96.4% could be achieved by placing 10 bots on router 3, 5 bots on router 5, and 5 bots on router 6. The reasoning being that having router 3 flooded would prevent traffic from users 1 and 2. Then, placing 5 bots on both routers 5 and 6 would force traffic from users 3 and 4 to be dropped.

Illustrated in the graph below are four lines each representing the amount of dropped packets per second for each user. With up to 200 packets being sent and received each second, the percentage of dropped packets are being represented by the ceiling value of any given unit of time.

