SEM: A Simulation Execution Manager for ns-3

Setup!

This lesson requires some setup. We will download a new copy of ns-3, and use that one for the rest of this lab.
Open up a terminal!

```
cd
git clone --recursive https://github.com/DvdMgr/sem-lab
```

What is in this folder?

Let's take a look inside:

```
cd sem-lesson
ls
```

This is what you should see:

`ns-3`	Our new ns-3 installation folder
`wifi-sem.cc`	The ns-3 simulation script we will run
`wifi-plot.m`	Octave script to plot the results of our simulations
`Slides`	Folder containing this lesson's slides

A look at our ns-3 simulation script

There is a copy in `ns-3/scratch` already, no need to modify anything in the `ns-3` folder.
Try it! This will also compile ns-3.

```
cd ns-3
./waf --run wifi-sem
cd ..
```

Summary of what `wifi-sem.cc` does

- Creates a WiFi network
- Provides a set of command line arguments we can use
  - Distance from AP
  - Number of devices
  - MCS
  - Using Request To Send (RTS)
  - Using Short Guard Interval (SGI)
  - Randomness of channel
- Prints the throughput of the network

Running the program with SEM

Distance / MCS

```
 sem run --ns-3-path ns-3 --results-dir results //
--script wifi-sem --parameters params1
```

- distance: [1, 20, 40, 60]
- mcs: [0, 3, 6]
- nWifi: 1
- useRts: False
- useShortGuardInterval: False
- randomChannel: False

```
sem export results.mat --results-dir results
```

See the impact of random channel

sem run –ns-3-path ns-3 –results-dir results –script wifi-sem –parameters params2
distance: [1, 20, 40, 60] mcs: [0, 3, 6] nWifi: 1 useRts: False useShortGuardInterval: False randomChannel: True
sem export results.mat –results-dir results

Exercise

Plot the throughput for increasing mcs and for every setting of SGI and RTS at a fixed distance

Point to the Github, explain they can contribute