

Remote Radio Operation with POWDER and GNU Radio

1. If you don't already have one, request a POWDER account here:

```
https://www.powderwireless.net/signup.php?pid=merif2019
```

2. Log in to POWDER:

```
https://www.powderwireless.net/
```

3. Start an experiment (use the "Experiments" menu "Start Experiment" entry if necessary), and change to the GNURADIO-SIM profile. Select the "Cloudlab Utah" cluster, and a duration of 1 hour.

4. Once the experiment is ready (several minutes), choose the only node in the experiment and open a shell. Within the shell, execute:

```
/share/powder/runvnc.sh
```

5. Open the link given in the shell, of the form:

```
https://node.foo.merif2019-pg0.utah.cloudlab.us:8787/vnc_auto.html
```

6. Within a terminal in the resulting VNC desktop, execute:

```
gnuradio-companion /share/powder/merif2019/psk.grc
```

and you will be able to manipulate and run the GNU Radio Companion flow graph on the remote system.

7. When you are finished, return to the experiment page and press the "Terminate" button.

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8. At a later time, try an equivalent configuration with real radios. Start another experiment, but use the GNURADIO-SDR profile and the Emulab cluster this time. There will now be *two* nodes in the topology; use one as the transmitter and the other as the receiver. Open shells on *both* hosts and start VNC on them; start one instance of GNU Radio Companion on each host as:

```
gnuradio-companion /share/powder/merif2019/tx.grc
```

```
gnuradio-companion /share/powder/merif2019/rx.grc
```

and by running both flow graphs, you will be able to experiment with the radios connecting the two systems.

9. When you are finished, return to the experiment page and press the "Terminate" button.