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Drone Latency Project Information Document:

Placethings

- Placethings claims it 'follows python PEP8 standard and is python 2-3 compatible yet the code does not seem to run properly without modification. I ran into this issue on my fresh installation of ubuntu 18 and Shinan ran into this issue as well on the lab computers. These issues can be fixed by modifying the private variable assignments in the code (intensive edits) or using python2.7
- Even with fixing these errors there seems to be a code-level issue with running the demo case. Placethings documentation says that I should be able to run 'python main.py -tc test_ddflow_demo_local.Test -v'. However, after following the rest of the installation instructions, namely installing containernet, ilp solvers and python packages, and pulling kumokay/heliot_host:v4 in docker, this line of code fails to run with two different error messages based on whether it is run in python2.7 or python3. In python3 it complains of one of many private variable assignments as previously mentioned stating that for a given statement X.y, X has no attribute y which I believe is a common python3 compatibility issue. Example: 'GdInfo.Cost' has no attribute 'Cost'. In python2.7 running this line errors with 'Cannot import from placethings config'

Star Topology

- After researching several types of topologies, I proposed we use a Star topology to simulate drones connected to a central machine learning processing module. I suggested this topology as in a typical drone IoT setup, to my understanding, these drones would not be communicating with each other, only with the central ML backend. Therefore, we want a single connected from the central ML backend to each drone.
- This topology would also allow us to easily test effects of adding/removing drones on the fly as doing so effects only removing or adding one connection. In particular, having a link only from the machine learning backend to the drone node is important to the idea of drones being 'removed' or 'taken down' as a taken down node in a star topology only effects that singular node and allows the rest of the network to continue functioning.

Troubles with Creating a Custom Topology for Placethings

- There are plenty of resources for learning how to write custom topologies for mininet which placethings is built on, but there is little documentation in placethings for how to create compatible custom topologies. There are examples provided (which I cannot run right now as stated above) but little documentation on how placethings and mininet features interact.
- For example, if I want to create my own topology do I do so in mininet or in placethings. And if I do so in mininet how do I insert placethings nodes to my custom topology such as a drone/camera.

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- The code for creating topologies in mininet appears simple once I gain an understanding.

Issues with Lack of Knowledge

- I am currently trying to figure out the intricacies of networks which is a gap in my knowledge.
- For example, I am trying to figure out how switches relate to hosts and how I would construct a topology using them.

Intended Roadmap

- Gain a better understanding of switches and hosts (general networking)
- Figure out whether a custom topology needs to be written in placethings, mininet, or both
- Write what should be a simple Star topology with nodes being the pre-defined placethings 'drone' (camera) linked to a central machine learning processing backend
- Write a script which runs this topology for a user-defined n number of drones