Onions: Are they always tasty?

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1 Tor Circuit Creation

1. Download the Tor source code, compile it, and install it on one of your VMs.
2. Create a custom Tor client circuit using either the Tor control port (default is TCP 9051) or using the Tor `stem` library. The Tor circuit should have a length of 4 hops instead of the usual 3 hops.
3. Finally, you need to show the screenshot with the 4-hop circuit and the TCP connection that goes through that. To test it, you can access any site using the Tor circuit. You can connect to the Tor control port directly or using the `nyx` program.

1.1 Submission Guidelines (15 points):

- A detailed description of the commands executed, what were their semantics and appropriate screenshots (for creating the 4-hop circuit).
- Screenshot showing the connection to the appropriate website is going over the Tor circuit.

2 Tor Relay Selection Simulator

You need to understand the Tor relay selection algorithm. For this you can do two things—refer to the Tor path spec file (shared as a reading reference) and/or inspect the source code (circ.c file in Tor source code). Therafter, you would need to design your own relay selection simulator. For this, you can prefetch the router consensus file directly from the Tor metrics site (or by doing a directory fetch). Thus, you should be able to generate random circuits from the consensus file. You can use that with your exercise 3 to construct custom Tor circuits afterward.

You can use any language of your choice for this.

2.1 Reading References

- https://github.com/torproject/torspec/blob/main/tor-spec.txt
- https://github.com/torproject/torspec/blob/main/control-spec.txt
- https://github.com/torproject/torspec/blob/main/path-spec.txt
- https://github.com/torproject/torspec/blob/main/guard-spec.txt

2.2 What to submit?

1. The source codes for all the components.
2. Makefile is to be used for compiling the individual components.
3. Readme file describing how the system works and what assumptions you have made.

2.3 Grading Scheme

1. Circuit/patch simulation and verification by creating circuits as suggested by the simulation. (20 points)
2. Circuit is functional and can be used for web-browsing/file-downloading. (10 points)
3. Readme describing the functionality of the system with the assumptions you made (5 points)