Informatics for Astronomers - WS2020

Roland Ottensamer, Marina Dütsch, Miguel Verdugo, Gerald Mösenlechner

Exercise sheet 8 - Network and Security

The following will be also part of the assessment:

(1) Try to present exercises in a way that everyone can understand (even those who didn't do the exercises), so please explain the vital parts of your solution in a clear way.

(2) Try to also include some background information where applicable, and/or explain the possible context/motivation for the given exercise.

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1. What exactly is the Internet (physically and logically)? What do I actually mean with *physical* and *logical* in this context? What is the World Wide Web?
2. In moodle you can find a `python` script called `portscanner.py` which scans the ports of a host to find out if any of them are open. Execute it, providing `localhost` as a input. How many ports are open?
   - Now open a session of `jupyter notebook` and execute the script again. Do you see a difference?
   - In a separate terminal execute: `python -m http.server` and execute the script again.

   What is happening?
3. Use the command `traceroute` to a website of your preference. Describe the output of that command. Use the IP address listed in the output to find out the "physical" route that the packages followed using a geolocation service (e.g. ipinfo.io).
4. Use `ssh` to connect a server (e.g. `login.univie.ac.at`).
   - Use `scp`/`sftp` to download/upload files

   What `ssh`/`scp`/`sftp` stands for? Why?
5. Look in `PyPi` for a `python` package that can perform (text) encryption. Install it in your system and encrypt (and decrypt) the text generated by `import this`
   - After seeing the results, what is encryption useful for?