

Setup and Deployment of a Resilient Internet Scanning Infrastructure

Motivation

We at the chairs research group GINO (Global Internet Observatory) [1] operate several Internet scanning servers. For Internet wide scans high reliability and reproducibility is important and highly useful. The Internet is full of unexpected behavior and hence we need to foster a setup of the scanning machine which is stable and reliable. This enables us to better debug problems with our scans.

Furthermore, the research community is aiming for a better reproducibility of Internet scans. By using a standardized setup which can be deployed with only few human interventions we could improve this situation significantly.

In this work we want to use PXE network boot with iPXE boot loaders [2] and a local HTTP web server which provides the kernel images to our scanning machines. By using Ansible [3] playbooks we can prepare standard images and setups which exactly meet our requirements.



Your Task

- Familiarize yourself with the main used tools (PXE/iPXE, Debian images, Ansible, ...)
- Understand the requirements and their accompanying problems
- Develop a pipeline which setup and fulfills the following goals
 - An iPXE boot server
 - A network boot process for our scanning machines
 - High reliability, low maintenance effort for the pipeline
 - Easy configurability and maintainability for each server
 - *Optional* Automatic build of new Debian images

Requirements

- Programming knowledge in the Shell/Bash scripting language (experience with Ansible is also useful)
- Good knowledge of the Unix ecosystem, especially with the Debian distribution
- Familiarity with GIYF-Based work approaches
- Good code quality in order for others to continue and understand your work
- Optionally: Experience with PXE/iPXE is useful

Bibliography

- [1] <https://net.in.tum.de/projects/gino/>
[2] <https://ipxe.org/>
[3] <https://www.ansible.com/>

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