

Ripe-Atlas Internet Communication Analysis Tool

Abstract

The Internet is a complex and dynamic network, whose performance is constantly changing depending on various factors, such as the nature of communication usage, malfunctions, cyber attacks, political events, and more. Measuring the performance of the internet network makes it possible to analyze its behavior and normality, and also makes it possible to learn about various events that affected the network's behavior.

RIPE Atlas is a global network of thousands of probes that measure Internet connectivity and reachability in real-time. The probes are distributed worldwide and provide valuable data on network performance, stability, and security. Here are **some** of the types of information that can be extracted from RIPE Atlas:

- 1. Network performance: RIPE Atlas probes can measure key network performance metrics such as latency, packet loss, and jitter. This information can help network operators and researchers to identify and troubleshoot network problems, as well as to compare performance between different networks.
- Internet reachability: RIPE Atlas probes can test the reachability of a website or other online service from different locations around the world. This can help website operators to identify and resolve connectivity issues that may be impacting their users.
- 3. DDoS attacks: RIPE Atlas can be used to detect and mitigate Distributed Denial of Service (DDoS) attacks. By monitoring traffic patterns and network performance, RIPE Atlas probes can help identify and respond to attacks in real-time.
- 4. DNS performance: RIPE Atlas includes a DNS monitoring service that measures the performance of DNS servers around the world. This can help DNS operators to identify and resolve performance issues that may be impacting the reliability and speed of their services.
- 5. Internet topology: RIPE Atlas probes can be used to map the topology of the Internet by measuring the paths that packets take between different network nodes. This information can be used to identify key bottlenecks and vulnerabilities in the network, as well as to develop more efficient routing algorithms.

Overall, RIPE Atlas provides a wealth of information on the performance and security of the Internet, which can be valuable to network operators, researchers, and other stakeholders. The goal of the project Is to building a tool that will pull and analyze publicly available statistics (published by RIPE Atlas), as well as analyzing the statistics in order to identify unusual phenomena during the Corona crisis.

Project overview

In this project you will:

- a. Define the phenomena you can identify
- b. Study the capability of currently available tools (see ref [2]) and define the capabilities of the tool you are about to develop. Your tool can be a wrapper for currently available APIs.
- c. Write a High-Level Design document that describes the software architecture of the tool.

(What modules are required and their interactions)

- d. Code and test your code.
- e. Use your tool to reveal Internet anomalies that occurred during the Covid-19 crisis.

Prerequisites

1. Introduction to computer networks (236334).

Notes

• The above project's aim is to produce in the long run an academic paper. The project can also be a good way to start a research proposal for an MSc.

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References:

[1] The Ripe-Atlab Website: <u>https://atlas.ripe.net/</u>

[2] Available tools: https://atlas.ripe.net/measurements-and-tools/tools/

[3] Magellan, The official command-line client for RIPE Atlas: A <u>https://ripe-atlas-tools.readthedocs.io/en/latest/</u>