Daniel Cartwright

Work Experience

2017–Present **Programmer**, *Layer 3 Communications, LLC.*,

I develop and maintain a suite of network security tools in `Haskell` as part of a small team.

- Allsight - A distributed SIEM. The tool ingests syslog from various network devices (e.g. switches, routers, firewalls) and puts them through several transformative analysis pipelines (powered by Apache Kafka). From this data, the tool uses rules defined by security experts to detect both single-log and multi-log (correlated) events, on which it then alerts via various channels, to clients and security response teams (either NOC personnel or security engineers). The tool has a frontend through which our security team can configure rules and view collected data. Clients can also use the frontend to view all data relevant to them.
- Insight - A consumer of Allsight. For clients with SSL Decrypt enabled on their network, this tool run simple pattern-matching rules over all web search data, alerting users who have subscribed to each rule. This is used by school districts to track web searches of students.
- Diamond - A network performance monitoring system. Uses SNMP to gather metrics from network devices (e.g. interface throughput; utilization of CPU, memory, storage, power). The tool is fully concurrent; thousands of hosts can be polled in about 30 seconds total. These metrics are normalized and pushed into Apache Kafka. The data is sent to an alerting tool as well as InfluxDB/Grafana.
- Netcrawl - Uses SNMP and LLDP to brute-force the discovery of a network, given only a subnet or set of subnets. The tool collects a variety of useful data about each node in the network, and outputs a summary which can be analysed by human or another tool. The graph of the network can be output as a GraphViz dot file. It is used to inform tools such as Diamond.
- Lightband - A GUI tool for ISPs that makes configuring ONTs significantly easier.

Open Source Programming

2017–Present **Maintainer & Contributor**, *chessai*,

I began writing `Haskell` in August of 2017, `Nix` shortly after. Since then, I have contributed to over 200 open source `Haskell` projects. I actively maintain or co-maintain roughly 100 open source `Haskell` libraries. I am a member of the Haskell Core Libraries Committe, which oversees and maintains the core libraries that make up the `Haskell` ecosystem. I am a drive-by contributor of the Glasgow Haskell Compiler. Listed are a few projects to which I contribute proudly.

- refined: Embedding simple first-order refinement types inside of GHC Haskell. Supports run-time and compile-time refinements.
  | `Haskell` | 5195 | 3622
- streaming: Haskell streaming library.
  | `Haskell` | 342 | 292
- eigen: Haskell bindings to the Eigen C++ linear algebra library. Provides a type-level interface to dimensionality, making many operations statically-verified to be safe.
  | `Haskell` | 342341 | 15327
- nixos-configs: My NixOS configs.
  | `Nix` | 2674 | 1353

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