

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 runs simple pattern-matching rules over all web search data, alerting users who have subscribed to each rule. This is used in school systems 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**. Three consumers read from this data: one which alerts on metrics that are indicative of a performance issue, one which pushes the data into **InfluxDB**, and one which generates the **Grafana** dashboards based on the structure of the data. **Grafana** uses **InfluxDB** as a data source for visualising all of this data.
- **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 Committee**, 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 heavily and 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

Skills

Programming	Haskell	Expert
	Nix	Advanced
	C	Intermediate
	Rust	Intermediate
	Idris	Intermediate
	Purescript	Intermediate
	C#	Novice
Software	Linux, NixOS, git, Dhall, \LaTeX	