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 rulesand 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 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.
- Set up and maintained a hydra for Layer 3 Communications developers.

Open Source Programming

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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 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	

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