Mikhail Vorozhtsov

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Summary

- Ten years of solving problems with strongly, statically typed functional languages (Haskell, Scala).

- Strong skills in formal language translation, covering both DSL design and industrial compilers internals.

- Broad experience in software development, from bare-metal programming to type-level computations and back again.

Work experience

2018-present   Senior Software Engineer at NetCracker (Moscow, Russia)

RnD department
- Heavily involved in design and implementation of a scalable, low-latency online charging system prototype for mobile networks (Rust, Tokio, specialized Kafka client).
- Team lead on a visually programmable ETL/ML task builder/orchestrator project (Scala, ZIO, Spark, Hadoop, MongoDB, Ignite, Kafka).

2017-2018   Senior Software Engineer at OneFactor (Moscow, Russia)

ML-based services for the banking and advertising industries. A member of data delivery team.
- Developing and supporting an internal service for de-identification and cross-DC data transfers (Scala, Hadoop, Spark, ZooKeeper, Kafka, Akka, MongoDB).

2013-2016   Senior Software Engineer at Yaliny (Moscow, Russia)

Startup that aimed to prototype, develop and launch a telecommunication system built around a LEO satellite constellation.
- Designed and specified the network stack (non-IP based) used throughout the system for voice calls, user data transmission, and maintenance traffic.
- Designed and implemented an EDSL (Haskell) for describing behaviour of network nodes (as a special kind of automata). The purpose of the DSL was to provide high level definitions that could be verified, tested (via interpretation) and used to automatically generate documentation and low level (C, HDL) implementations.
- Developed toolchains for two generations of soft-processors with non-conventional (no register file in the usual sense) proprietary architectures. The toolchains consisted of algebraic assemblers (Haskell, custom monadic parser combinators library), linkers (ports of GNU *gold*), and LLVM backends.
- Developed telecommunication system simulator client (Scala, Netty, SWT, LWJGL, GLSL).
- Prototyped mobile telephony application (Scala, Android).

2011-2013   Freelancer

Designed and developed a software system for providing VPN services, including
- Access server software (Haskell, OpenSSL, OpenVPN), on top of a custom asynchronous I/O library (an early prototype of the library in Scala is available here) that relied on STM. Among other things, a caching DNS server (using network-dns), NAT-PMP server (using network-natpmp), and a Linux kernel module for traffic shaping were implemented.
- Client software (C++, Qt, WinAPI, WinDDK). Patched the TAP-Windows driver vs broadcast/multicast traffic filtering.
- System control and configuration software (Scala, JavaFX, Netty, X.509, JCA/JCE).
- Site backend (Scala, Lift, Akka, Netty, Spring, Hibernate, PostgreSQL).

2010-2011 Senior Software Engineer at Studio DVA (Omsk, Russia)

Social network game development.

- Introduced Scala to the company.
- Designed and developed game backend (Scala, Netty, MongoDB, Redis, REST) on top of a HTTP routing library and MongoDB query DSL.
- Implemented a Scalac plugin for easier annotation placement.

2008-2010 Software Engineer at Zeon Group (Omsk, Russia)

Solutions for network traffic accounting and control.

- Created a minimalistic application server for special purpose Java applications (Scala, Jetty, JPS, PostgreSQL, C), which ran on top of a custom Linux distribution, integrating closely with system components such as *udev*, *mdadm*, and *iptables*.
- Implemented *iptables* module for traffic accounting.

Additional Experience

- A humble GHC contributor (the `LambdaCase` extension, several Template Haskell improvements 1, 2, 3, 4, 5).
- 20+ libraries on Hackage.
- Worked on a microkernel for the `x86_64` architecture in 2007-2008.

Education

2001-2006 Omsk State University (Omsk, Russia)

M.S. in Applied Mathematics and Computer Science