

## Contact

+41792148374 (Mobile)  
igor@novg.net

www.linkedin.com/in/igor-novgorodov-420aa2a3 (LinkedIn)

## Top Skills

Software Development  
System Administration  
Network Engineering

## Languages

English (Professional Working)  
Russian (Native or Bilingual)

## Certifications

Cloudera Hadoop Administration  
Verimatrix Engineer

## Publications

Creating a fault-tolerant iSCSI SAN  
Creating a FC SAN storage using LSI Syncro

# Igor Novgorodov

Senior System Engineer at Swisscom  
Zürich, Canton of Zürich, Switzerland

## Summary

I'm a software developer/architect, system and network engineer. 15+ years of experience in different areas of IT.

My areas of expertise:

- \* Software development: mainly Golang, Python, Javascript and other languages
- \* System engineering: deep knowledge of Linux and some other Unix-like operating systems
- \* Networking: thorough experience in architecture, protocols and hardware (mainly Cisco)
- \* Databases: OLTP: mainly MySQL, PostgreSQL. NoSQL: worked a lot with Cassandra, Aerospike. OLAP: Built data warehouses using Clickhouse, some Hadoop experience.

I've designed and developed a number of network services, among of which are: streaming monitoring solutions, RADIUS and DHCP servers, Netflow parsing engine and lots of REST/HTTP and GRPC APIs.

Created and/or deeply modified a number of low-level libraries, for example RADIUS/DHCP/SMPP protocol implementations in Go.

I like to contribute to the open source community and trying to return my work by doing pull requests to the libraries and other projects that I use.

Some of my code is available on GitHub: <https://github.com/blind-oracle/>

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## Experience

Swisscom  
DevOps Engineer  
December 2018 - Present (1 year 3 months)  
Zürich Area, Switzerland

My job at Swisscom TV is SRE-like: mostly software development plus some system engineering.

Our team runs big clusters of NPVR (~500 servers) which needs to be managed and monitored. We serve about 2.5Tbit/s of video traffic from 100PB + storages.

My currently finished projects:

- Streaming monitoring clustered service to process several million metrics per minute (Golang)

Compared to old Riemann-based alerting system: 60x memory and 20x CPU usage reduction.

- Metric relay service to convert them between different formats e.g. Riemann/Graphite (Golang)

- Modular cluster management system with web UI (Python/Flask + Javascript/Vue.js)

- Cluster rolling restart orchestrator with specific software-imposed requirements and console UI (Python)

- Architected & deployed new storage for metrics in Clickhouse to replace old Cassandra-based setup which didn't scale well: we gather & store more than 2 million metrics per minute. The result was 100x storage usage reduction and 20x speedup querying data.

tutti.ch

Senior Software Engineer

November 2017 - November 2018 (1 year 1 month)

Zürich Area, Switzerland

I was working as a backend engineer in a small team on one of the largest web sites in Switzerland - online marketplace tutti.ch

Software stack: Golang, C, PostgreSQL, Redis

MaximaTelecom JSC

2 years

Systems architect, head of networking software development

January 2017 - November 2017 (11 months)

Moscow, Russian Federation

Me and my team has developed from the ground up and was supporting the following projects:

- RADIUS server: sophisticated request logic; highly performant; multi-level request caches; session storage in Aerospike DB; online configuration reload and many other features
- DHCP server: dynamic subnet definition generation based on templates in real time; pool loading from DB and/or TOML; persisting leases in Aerospike DB for hot restarts
- Communication Service (SMPP, Instant Messaging): Highly performant modular messaging system that handles sending/receiving messages through various protocols (SMPP, E-Mail, IM) and performs bulk message sending (millions of messages per single bulk). One of its main goals is to power Moscow subway emergency messaging broadcast. Storage - Aerospike and Cassandra.
- Network Monitoring System: client-server software to monitor continuously the wireless/wired link between vehicles (subway trams) and datacenter
- A lot of other microservices and modules

We were using the modern software stack: Golang, Aerospike, Cassandra, RabbitMQ, InfluxDB, Grafana, MySQL, ELK, ClickHouse and others.

### Senior System Engineer

December 2015 - December 2016 (1 year 1 month)

Moscow, Russian Federation

The main goal of our team was to keep the IT infrastructure supporting huge Wi-Fi network in Moscow city & subway up and running. As a side project I've developed a scalable RADIUS and DHCP servers with very specific requirements for our network to which we migrated from FreeRADIUS and decentralised DHCP - see next job position.

Some numbers:

- 800 trains (4500 train cars), 6500 buses
- 8 mil. unique clients a day, 500k wireless users simultaneously, 20+ Gbit/s of traffic
- RADIUS: 1k+ rps, DHCP: 4k+ rps, 5k+ subnets

Other projects include providing Wi-Fi access in buses/trams (Moscow City Transport network), stadiums, airports, trains (Moscow electric trains).

Our team was responsible for the following IT infrastructure:

- VMWare vSphere clusters (50+ hosts), Linux/FreeBSD/Windows servers (500+ mostly virtual)
- Highly loaded services including:
  - RADIUS, DHCP, DNS (Unbound, 20k+ reqs/sec)
  - HTTP servers (nginx) serving up to 10Gbit with TLS
  - Databases (MySQL/MariaDB, Cassandra, Aerospike)
- SAN infrastructure (iSCSI, FC on HP MSA)
- Hadoop cluster (10 hosts, HDFS, Spark, Hbase, Flume etc)
- A lot of other minor systems that supported our infrastructure

## KR Properties

### Senior System Engineer

November 2008 - November 2015 (7 years 1 month)

Responsible for the health & development of the company's IT infrastructure. IT department tactical management.

Hardware & OS administration:

- Linux, Windows Server, VMWare vSphere
- Network devices: mostly Cisco (ASA firewalls, routers, switches, fibre channel etc)
- VoIP: Asterisk, Avaya

Some highlights:

- Migrated physical servers to vSphere private cloud
- Built VDI infrastructure (Horizon View, Zero-clients, nVidia GRID, Teradici APEX)
- Migrated from iSCSI to FC SAN infrastructure
- Implemented geographically dispersed VPN network based on DMVPN/OpenVPN, EIGRP/OSPF
- Created custom highly available SAN storages (Linux, DRBD/LSI Syncro, SCST, Pacemaker, iSCSI/FC)
- Migrated VoIP from Avaya to Asterisk
- Set up mail system with Linux frontend (HAProxy, ClamAV, Postfix, Rspamd) and MS Exchange backend
- Company-wide proxy with transparent kerberos AD authentication (Squid, SSL bumping)

- Developed an intranet help-desk system with AD integration and transparent authentication (PHP/Perl/MySQL)
- UI for user lifecycle management: creating and removing users from AD, VoIP PBX (PHP/Perl/MySQL/Powershell)
- Mail archiving system for the need of security department (Perl, MySQL, Postfix)

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## Education

National Research Nuclear University MEPhI (Moscow Engineering Physics Institute)

Unfinished, Automation Engineer Technology/Technician · (2002 - 2004)

Lyceum #1, Protvino, Moscow Region

· (1991 - 2002)