

## MARTIN MILLNERT

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**Quote** *A designer knows he has achieved perfection not when there is nothing left to add, but when there is nothing left to take away.* – Antoine de Saint-Exupéry

**Motto** *Problems are inevitable. Problems are soluble.*

**Goal** Strong general interest in the improval and advancement of the human species, particularly in the role and importance of science and technology to this end.

General (layman) current interest in different technology/problem areas such as: Space, AI/automation, Sustainable Energy, Genetics.

Pivoting towards above areas via existing skill set. Bridging areas:

- High performance networking virtualization
- Cloud / Infastructure as Code
- Whitebox/ODM, Linux SDN.
- Artificial intelligence (AI) - deep learning neural networks.

**Skillset summary** Computer science engineering generalist with rare “really full stack” knowledge:

- Physical: computer / networking
- CPU, memory, buses
- OS & kernel
- Software: language - code - machine code compilation
- Algorithms and data structures
- Distributed systems and API:s
- Problem solving using *divide and conquer*
- Delivering value from systems
- Solving high level problems that have significant impact

Strong background in networking, virtualization and cloud with “devops”.

Many years of experience with Open Source communities’ to upstream changes.

High-volume information consumer.

**Hobbies** Reading - High volume consumer of science and technology books and podcasts.  
Exercising (great audio book time enabler).  
Political interest in facts, science and reason for humanity.  
Long time active in multiple social networks related to networking, automation & cloud.

**Education** **M.Sc. Networks and Distributed Systems, 2007-2010, 2015**  
Chalmers University of Technology, Sweden  
Coursework: Mathematical Modelling, Fiber-optic Communication, Parallel Computer Organization and Design  
Master Thesis (2015): *A Distributed, Parallel & Fault Tolerant BGP Routing Daemon* - Designed & implemented a BGP daemon from scratch using Erlang & RFCs, in parallel with >full-time position at IPnett.

2006-2007 Informàtica  
Coursework: Network Security (rare 10/10 grade), AI, Neural Networks  
Universitat Politècnica de València, Spain

2002 - 2006 Computer Science and Engineering  
Chalmers University of Technology, Sweden

**Experience** **BrainMill, Sweden**  
Co-founder & CEO 2017/04 -  
Co-founder & CEO of BrainMill AB; consultancy company delivering services within AI & data analytics as well as software-defined server, network and cloud infrastructure.

**Safespring, Sweden**  
CTO 2017/01 - 2017/04

IPnett Cloud Services spun-off to “Safespring”. Identical role as “CTO Cloud Services” below.

**IPnett Group, Sweden**  
CTO Cloud Services 2014/08 - 2016/12

Responsible for the architecture of IPnett Cloud Services. Saw my function similar to that of a programming language compiler: Optimizing a highly complex set of requirements onto a (opportunisticly) optimal resulting technical design. Design by various efficiency metrics, using OpenStack with KVM virtualization, OpenContrail and Ceph.

**IPnett Group, Sweden**  
Solutions Architect 2012/09 - 2014/07

Architecting solutions for customers within service provider and enterprise net-

working: passive/active optical and IP. Belief in winning through true customer satisfaction.

**IPnett, Sweden**

Senior Consultant

2012/04 - 2012/09

Worked internally on RFP bids, presales activities and public speaking.

**SUNET, Sweden**

Board member

2011/01 - 2012/04

Board member of SUNET, the Swedish National Research- and Educational Network (NREN). Strategic questions for Swedish Research Infrastructure, and national common university IT- and network infrastructure issues.

**Cisco Systems, Boxborough, Massachusetts, USA**

Internship

2011/01 - 2011/06

Internship at Cisco in the LUDD project; fault-tolerant router design and high-performance CPU forwarding. Assisted the group with tasks and learned a lot about router design and hardware/software interfacing.

**Stiftelsen Chalmers Studenthem, Gothenburg, Sweden**

Network Group Manager

2009/01 - 2010/12

Network Administrator

2007/07 - 2008/12

System Developer / Network Support

2004/10 - 2007/06

BGP-enabled a 2000-apartment large dormitory access network with its own transit, peering (PNI & IX), ASN and address space (4+6). Finally managed the group and the company's network budget. Then lead the company to undertake a significant dark fiber deployment investment in addition to a complete fork lift upgrade to GE end-user ports and 10GE backbone, using Juniper equipment. Collaboration experience throughout this time with other networks including SUNET (the Swedish NREN) and NORDUnet. Net end result: 2000 subscribers, in year 2011, having symmetric GbE access for  $\approx 7$  EUR/month/subscriber (5-10% of market price).

**Publications**

**A Distributed, Parallel & Fault Tolerant BGP Routing Daemon**

Chalmers University of Technology

2015-07

**Routers for the Cloud: Can the Internet Achieve 5-Nines Availability?**

IEEE Internet Computing

2011-09

**Skills (A-Z)**

Administrative, managerial, business, sales:

- Answering public tender, RFP, RFQs

- Business case creation
- Laying and meeting budgets
- Legal analysis / concerns (PUL, GDPR, Procurement)
- Managing teams of network/system admins, devops people
- Negotiating with vendors and suppliers
- Outsourced development interaction & management
- Product ownership & development
- Public speaking and presentation
- Team building; hiring network/system administrators and programmers
- Writing RFP/RFQ

Algorithms & general software engineering training:

- Algorithmical training: time complexity, performance
- Distributed systems technologies
- Low level: Memory hierarchy, instruction level optimization / pipelining
- Mathematical modelling and problem solving - classification/generalization
- Programming language theory/compilers (introductory)

Cloud technology skills:

- Ceph: Design, implementation and operation
- OpenContrail: Inhouse packaging, patching/contribution and production operation
- OpenStack platform - lead design and implementation of public cloud platform
- Public cloud: AWS, Azure, GCE - administration and usage

Database skills:

- Cassandra (short)
- InfluxDB (short)
- MariaDB/MySQL (medium)
- PostgreSQL (long)
- Theory: Formal university database education (multiple courses)

Development environments:

- Emacs, vim
- GIT
- GNU Make / Makefile

- Eclipse, IntelliJ IDEA

DevOps / System administration skills:

- Applications: Apache HTTPd, Apache Tomcat, BIND DNS, ISC's DHCPd, ExaBGP, HAProxy, OpenVPN, Postfix, RabbitMQ
- CI/CD tools: Gerrit, GIT, Jenkins, JIRA
- Configuration Management: cfengine, Puppet
- Databases: MariaDB, MongoDB, MySQL, PostgreSQL
- Monitoring tools: Icinga, Mon, Munin, Nagios, OP5
- Operating Systems: Debian GNU/Linux, CentOS/RedHat
- Operations: On call setup, team knowledge dissemination, root cause tracing and fixing
- Software packaging & distribution: deb/RPM packaging
- Storage: In general - in-depth understanding of storage technologies. In particular: Ceph
- Time Series & Metrics: InfluxDB, Grafana, Telegraf
- Virtualization & Container Technology: KVM, Xen, Docker

General computer tools:

- Diagramming: dia, dot, Graphviz
- LaTeX
- LibreOffice.org's Calc, Writer. Microsoft Excel, Word
- Markup languages: ReStructured Text (RST), Markdown (MD)
- Mathematica, Matlab
- Web browser (Performance debugging / developer mode)

Network configuration and debugging tools:

- tcpdump, tcpdump, tcpflow, Wireshark, tshark
- packet, other pcap-related packet injection tools
- nmap, xprobe2, iperf, ping, ping6, fping
- telnet, netcat, netcat6, socat
- traceroute / traceroute6, tcptraceroute / tcptraceroute6, mtr, mtr-tiny
- whois, Looking glasses, RIPE interaction
- Quagga routing protocol suite

Network design and laboration tools:

- Optical / network design tools, OPNet, Optiwave (brief experience), ADVA optical planner,
- GNS3 with IOS, JunOS

Network technologies and management:

- Physical communication layers: optical and electrical
- MAC layer, Ethernet, IPv4, IPv6
- ARP, ICMP, ICMPv6, DHCP, DHCPv6, TCP, UDP
- BGP, OSPF, OSPFv3, ISIS, HTTP, DNS, SMTP, SNMP, FTP, SSL
- IPv6 advocate & transition technologies (tunnelling),
- High Availability: VRRP / Heartbeat, ExaBGP
- Linux Kernel network performance optimization and tuning
- Switch platforms: IOS, JunOS, HP, Allied Telesis, Foundry, Extreme
- Router platforms: IOS, JunOS, Mikrotik RouterOS, Quagga
- Abuse-, cert- and IRT- handling
- Network monitoring: Nagios, mon, iperf3 throughput/latency matrices
- Network automation: Ansible, Expect (screen scraping), JunOS automation
- Optical networks: Passive/Active WDM / CWDM / DWDM
- Design and architecture of IP and CATV access networks

Open source project participation:

- Ceph, distributed storage system (2007 -)
- FD.io VPP (Vector Packet Processing) (2016-)
- Linux kernel network stack (2004 -)
- OpenStack (2014-) - contributor
- OpenContrail, SDN project (2015-) - contributor
- Quagga routing protocol suite (2005 - 2011)

Programming and scripting languages (experience length):

- ASM (short)
- Bash (medium)
- C (medium)
- C++ (short)
- Erlang (medium)
- Go (short)
- Haskell (short)

- Java (medium)
- JavaScript (short)
- PHP (short)
- Python (long)
- R (short)
- Ruby (short)

In general, largely thanks to my university training, I can pick up new either imperative or functional programming languages after a modest time of training.

**References**

Delivered upon request.