

CURRICULUM VITAE

## CONTACT INFORMATION

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## OBJECTIVE

A technical leadership position in systems research, working on challenging research problems at the intersection of operating systems, virtual machines, and computer architecture.

## EMPLOYMENT HISTORY

**2009 — Current** *Manager, Virtualization and System Architecture—IBM Haifa Research Lab.*

I managed a team of approximately 10 researchers working in the areas of hypervisor, operating system, and I/O technologies.

**2003 — Current** *Researcher—IBM Haifa Research Lab.*

I conceived, researched, designed and implemented systems either alone, as part of a team, or while leading a team. For example, I:

- Researched, designed, implemented, and optimized operating system (Linux) and hypervisor (Xen) support for IBM's Calgary PCI-X and CallIOC2 PCI-e IOMMUs on the x86-64 platform [iommu06] [iommu07].
- Conducted research and led a team of researchers working in the areas of I/O for virtualized systems [kvmda08] [sio08] and core hypervisor technologies.
- Designed and implemented firmware for the “IP Only Server” [iponly06], which had only CPU, memory, and network but could run unmodified x86 operating systems.
- Worked on TCP acceleration [tcpaccel06], on machine learning for monitoring virtual machines [vigilant08], on memory and storage checkpointing of VMs [cdpvm08], and on OS support for programmable devices [hydra08].
- Developed a proof-of-concept Linux network driver for an experimental ethernet adapter and embedded system software for the IBM DS6000 storage controller.

**2002** *Linux kernel Engineer - Qlusters, Inc., Tel Aviv, Israel.*

I developed some of the core components of Qlusters' Linux based cluster OS.

**2000 — 2001** *Programmer and Systems Analyst—Pointer Software Systems, Israel.*

I designed and implemented creative solutions to customers' problems, such as an object serialization framework, an embedded database engine, and a library for GSM modems.

**1997 — 2000** *Programmer and Programming Team Leader—IDF, Intelligence Corps.*

I designed and implemented several projects dealing with parsing, understanding and representing large amounts of data.

## AWARDS AND HONORS

**2009** *IBM Research Accomplishment*

Received an IBM Research Accomplishment for contributions to “Linux and Open Virtualization”.

**2008** *IBM Research Accomplishment*

Received an IBM Research Accomplishment for contributions to “Availability Manager for virtual machine availability systems management in IBM Systems Director”.

**2006–2011** *IBM Master Inventor*

Appointed Master Inventor in recognition of extraordinary contributions to IBM’s intellectual property.

## SKILLS SUMMARY

- Operating Systems:** Excellent knowledge of the Linux kernel, system libraries and software. Core Linux developer. Familiarity with other operating systems and hypervisors.
- Programming:** Excellent knowledge of C. Varying levels of proficiency in C++, Java, Perl, Python, ML, Pascal, Lisp, shells, x86 and PPC asm.
- SW Engineering:** Well versed in all aspects of the software engineering process, including research, analysis, design, review, development, QA and verification.
- Management:** Experienced in management of small groups and managing geographically distributed research and software development projects.
- Communication:** Excellent oral and written communication skills, teaching and training experience. Frequent speaker on technical subjects.

## SELECTED PUBLICATIONS

- [vnic09]: **Applying Amdahl’s Other Law to the Data Center**, IBM JR&D, 53(5)
- [nap09]: **NAP: A Building Block for Remediating Performance Bottlenecks via Black Box Network Analysis**, ICAC ’09
- [reservoir09]: **The RESERVOIR Model and Architecture for Open Federated Cloud Computing**, IBM JR&D, 53(4)
- [sio08]: **Scalable I/O—A Well-Architected Way to Do Scalable, Secure and Virtualized I/O**, WIOV ’08
- [kvmda08]: **Direct Device Assignment for Untrusted Fully-Virtualized Virtual Machines**, IBM Research Report H-0263
- [hydra08]: **Tapping into the Fountain of CPUs—On Operating Systems Support for Programmable Devices**, ASPLOS ’08
- [vigilant08]: **Vigilant—Out-of-band Detection of Failures in Virtual Machines**, ACM SIGOPS Operating Systems Review, 42(1)
- [cdpvm08]: **Virtual Machine Time Travel Using Continuous Data Protection and Checkpointing**, ACM SIGOPS Operating Systems Review, 42(1)
- [iommu07]: **The Price of Safety: Evaluating IOMMU Performance**, OLS ’07
- [iponly06]: **IP Only Server**, USENIX ’06
- [iommu06]: **Utilizing IOMMUs for Virtualization in Linux and Xen**, OLS ’06
- [tcpaccel06]: **Loosely Coupled TCP Acceleration Architecture**, HOTI ’06
- [Patents]: **Patent disclosures**, Author of 24 patent disclosures which have been submitted for filing to the USPTO. Full list is available upon request.

## PROFESSIONAL SERVICE

- Workshop Co-Chair:** WIOV '10, WIOV '08, SYSTOR '07.
- Journal guest editor:** ACM SIGOPS Operating Systems Review, special issue on Research and Developments in the Linux kernel.
- PC Member:** ICS '10, WIOV '10, SYSTOR '10, SYSTOR '09, MMCS '09, WIOV '08, SYSTOR '07.
- Publicity Chair:** SYSTOR '09.
- Member:** USENIX, ACM SIGOPS, EuroSys.

## FREE SOFTWARE

**Linux Kernel**      <http://www.mulix.org/kernel.html>

I am an active Linux kernel developer, maintaining the Calgary IOMMU and contributing to other areas of the kernel.

**KVM Hypervisor**   <http://kvm.qumranet.com/kumwiki>

I am an active KVM hypervisor developer. I am working on IOMMU support for KVM, and also contribute to other areas of the hypervisor.

**Xen Hypervisor**    <http://www.cl.cam.ac.uk/research/srg/netos/xen/>

I developed IOMMU support for Xen, and also contributed to other areas of the hypervisor.

**syscalltrack**      <http://syscalltrack.sf.net>

I co-founded the syscalltrack project, led it and was its most active developer. syscalltrack is a Linux kernel 2.4 based tool for debugging and monitoring a Linux system. I designed and implemented large parts of the kernel modules, the configuration and control utilities, the libraries and the testing framework.

**ADSL/pptp**         <http://www.mulix.org/adsl.html>

I reverse-engineered the pptp protocol and wrote patches to the pptp client to allow Linux users in Israel to connect to Bezeq's ADSL service.

**Various**            <http://www.mulix.org/code.html>

I contributed patches to several other free software projects.

## EDUCATION

Partial studies in Computer Science in the Technion and the Open University, Haifa, Israel.

## LANGUAGES

Fluent in Hebrew and English.

## REFERENCES

Available upon request.