

**Michael Brutman**

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**Summary:**

I am an engineer with a wide array of experience, ranging from hard drive firmware to supercomputers. I have moved beyond purely technical work to leadership and mentoring but I still enjoy bit-twiddling whenever I can get to it. I am looking to do something new and interesting with other great people.

**Operating Systems:** Linux and other Unix variants

**Languages:** C, C++, Java, Go, PowerPC Assembler, SQL. (Note: My proficiency in each language varies depending on my current projects. I've worked with many others not in this list.)

**Skills:** Scalability, reliability and performance analysis; Distributed systems management and debugging; Embedded firmware; Operating systems and middleware development; Network applications; People herding. (I learn what I need to know.)

**Related Experience:**

*Google, July 2021 – present: Site Reliability Engineering, Google Cloud Persistent Disk*

I am currently getting up to speed on the service that stores and serves customer data in Google's cloud. Responsibilities are typical for an SRE: supporting production, improving performance, reliability and scalability, managing resources, etc. Early projects include assessing the design and production readiness for two new features targeted at high-end enterprise customers.

*Google, March 2020 – June 2021: Site Reliability Engineering Manager, Chrome SRE*

I managed two teams of SREs supporting the Chrome browser organization. Responsibilities included performance evaluations, quarterly priority setting, career coaching, compensation planning, interfacing with development and SRE leadership, supporting the team during the COVID-19 pandemic and the typical SRE responsibilities of supporting production services. Supported services included the Chrome Web Store, the Chrome browser password and history syncing service, an application update checking and distribution service, the Widevine DRM service, and some internal services.

*Google, February 2015 to March 2020: Site Reliability Engineer and Tech Lead, Chrome SRE*

During this time period the team supported the Chrome browser organization and the Chromecast/Google Home devices organization. Supported services included the Chrome Web Store, Chromecast, Google Home, Google Cloud Print, Widevine DRM, an application update checking and distribution service, and some internal services.

Responsibilities included improving the performance, reliability and scalability of services, capacity planning and resource management, debugging critical production issues, reviewing designs for new services, etc. Notable projects included writing the roadmap and launching a major monitoring migration for the team, supporting the rapid growth of a compression/performance browser proxy for developing regions, and a limited-scope engagement with the Google Hardware store that prepared them for a highly visible and successful launch event in 2018. (Traffic spiked by a factor of 200x in less than two minutes with no ill-effects.)

As Tech Lead I was responsible for ensuring the smooth execution of the team, quarterly priority setting, onboarding new team members and technical mentoring. Off-team activities included mentoring new Googlers, teaching incident management classes, and maintaining SRE-specific site infrastructure.

*Google, September 2013 – February 2015: Site Reliability Engineer, Ads Front-end*

The Ads Front-end team supported the Java web front-ends that customers interacted with when buying and selling advertising space on Google's advertising platforms. Notable projects included an analysis of production incidents and an analysis of our production deployment that showed that our deployment was not as resilient as we believed it was, leading to deployment changes that are still in place today.

*HGST (Western Digital), April 2011 – August 2013: Firmware engineer and Team Lead*

I was part of a team developing advanced firmware for the next generation of consumer and enterprise class hard drives. The firmware was based on early research on shingled magnetic recording, requiring advanced logical block location tracking and sophisticated memory management. My team owned the core components responsible for command execution, requiring absolutely correct execution in a very performance sensitive environment.

Responsibilities included new feature design and development, debugging failures, performance analysis, implementing new research concepts, and mentoring newer members of the team. The team was distributed with primary sites in the US and Japan. Reliability and performance were paramount as this code base shipped in tens of millions of devices across several generations of products. I loved this assignment because the problem space was complex and the technology was just incredibly fun – there is joy in building things.

*IBM, April 2010 – April 2011: Open Source Developer, Linux on PowerPC Compiler and Run-time Team*

I was part of the team that developed and maintained the open source GCC compiler and GLIBC run-time libraries for IBM PowerPC family processors. Responsibilities included developing optimized library routines for new processors to improve performance, adding new function to support processor extensions, and the general debug and support of the compiler and run-time environment. The compiler and run-time environment supported both server class and embedded processors and was critical to the success of IBM hardware offerings.

*IBM, August 2006 – March 2010: Lab Services Linux and Cell Broadband Engine Team Lead*

I led a team of twelve developers that worked on a variety of high performance computing projects using the Cell Broadband Engine CPU, an early multi-core processor with vector coprocessing units.

- Improved skills on the team by providing education and mentoring, leading to enhanced customer satisfaction and revenue.
- Reduced risk and cost to IBM on external contracts by working with the contracts team to ensure appropriate terms and scope.
- Taught formal classes both inside and outside of IBM on the CPU architecture and worked with external customers to adopt and exploit it fully.
- Defined the long term direction and goals of the team and worked with the team and management to realize those goals.

Some of my projects included developing a Fast Fourier Transform library for the IBM Cell BE software development kit, debugging and testing real-time Linux for use in a military application, designing and implementing a streaming data analysis solution for a large bank, improving the performance of scientific codes used in oil exploration and architecting a new risk management system for a large insurance company.

*IBM, February 2003 – March 2006: Developer, BlueGene L Supercomputer*

BlueGene L was a massively parallel supercomputer with 65536 compute nodes and 1024 input/output (I/O) nodes that held the title of the most powerful supercomputer in the world from November 2004 to June 2008. The machine was comprised of custom hardware running a Linux-like compute node operating system, Linux I/O nodes that provide I/O support to the compute nodes, and several conventional service machines.

- Supported our customer (Lawrence Livermore National Laboratory) with a 128 node Linux cluster running a hardware simulator until BlueGene L hardware was available.
- Designed, implemented and delivered the debugger interface to the machine ahead of schedule while collaborating with an external vendor.
- Dramatically improved the performance and reliability of the end user job submission utility.
- Provided internal and external support for debugging problems and improving customer satisfaction.

*IBM, December 2000 – February 2003: Performance Consultant*

I worked directly with customers and business partners performing custom programming and performance analysis of AS/400 and iSeries midrange computer systems. Specialty areas included DB2 performance analysis, Java performance analysis and Linux performance analysis. I improved customer satisfaction and directly impacted IBM revenue by reacting quickly to solve a wide variety of performance problems in real world applications.

*IBM, September 1992 to December 2000: Operating System Developer, IBM iSeries (formerly AS/400)*

During this time I worked on a few teams developing the operating system for the IBM AS/400. While not well known, the AS/400 was notable for being the first commercially available fully 64 bit operating system, the first widely available machine with CPU multithreading, and it was an early leader in hardware logical partitioning.

Assignments included rewriting operating system components to support the new PowerPC-based architecture, performance analysis, early hardware bring-up and verification, and providing support during critical customer situations. I ended my time in this organization as the owner of the task dispatcher for the operating system, which at the time was managing 32 CPUs and tens of thousands of active processes. Notable projects included the design of advanced performance data collecting features, several top scores on industry transaction processing benchmarks, and preparing the operating system for early CPUs that featured out-of-order speculative execution pipelines.

### **Patents:**

US 8516494 “Executing An Application On A Parallel Computer”, published August 20th, 2013

US 7805579 “Methods and Arrangements for Multi-buffering Data”, published February 5th, 2009

US 7363617 “Database breakpoint apparatus and method”, published April 22nd, 2008

US 7137120 “Dynamic Diagnostic Program For Determining Thread Wait Time”,  
published November 14th, 2006

US 6757785 “Method and System For Improving Cache Performance In A Multiprocessor Computer”,  
published June 29th, 2004

### **Education:**

Bachelor of Arts Degree in Computer Science, State University of New York College at Oswego

Masters Degree in Computer Science, University of Minnesota Twin Cities Campus

### **Volunteer Experience:**

*Board of Directors, Vintage Computer Federation (vcfed.org), September 2016 – December 2020*

The Vintage Computer Federation is a registered 501(c)3 charity whose mission is to preserve computing history through education, outreach, preservation and restoration. Preservation and restoration is conducted at our physical museum in Wall, NJ. Outreach activities include the hobby's largest web forum and three regional events ("vintage computer festivals") where the public is invited to experience vintage computers and related projects in a hands-on manner.

As a member of the board of directors I helped the organization set direction and execute its plans. In 2018 I produced the first VCF event in Seattle, coordinating 20+ exhibitors, 6 speakers, 10 volunteers and the staff at Living Computers: Museum+Labs. That event broke the museum weekend attendance record (over 1000 visitors) and was regarded as highly successful. In 2019 we expanded the event and broke our previous attendance record. Early in 2020 I did the preparation work to prepare the organization for two successful virtual events.

I gave up my role on the board of directors after four years to allow space for new points of view. I remain a volunteer.

**Professional Organizations:**

Association of Computing Machinery  
IEEE Computer Society