

# Résumé

**James R. Bergsten**

5025 Sleepy Hollow Road  
Cameron Park, CA 95682-9695  
(530) 672-1415

[jim@thebergstens.com](mailto:jim@thebergstens.com)

<http://www.thebergstens.com/resume>

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As a leader and key participant from start-up to public enterprises, I deliver high quality results quickly and efficiently. From individual contributor to C-level executive, I've lead teams of all sizes. **I get things done and enjoy doing it.**

I successfully help companies bring enterprise-class, high quality products to market - most recently, the world's-fastest-performing, network-attached NVMe array which is now receiving excellent customer acceptance and industry feedback.

I've designed and developed over ten successful commercial software/hardware packages, and have written and edited thousands of pages of product documentation, specifications, user's guides, reference, and marketing materials. I am the sole inventor of twelve U.S. Patents and co-Inventor of others.

I founded and ran a consistently profitable, award-winning software company and negotiated its merger, resulting in a twenty-five times return-on-investment, then founded and ran an enterprise that developed a world-class, open-systems data storage product, finally selling this business to a top-tier, publicly traded storage supplier.

I have significant experience in hardware, software, OS, storage, and networking on platforms ranging from embedded systems through mainframes, gained by "hands-on" managing the delivery of successful high tech products – leading architecture, design, development, test, debug, support, documentation, sales, marketing, information technology, strategic planning, finance, and administration. I excel at designing easy-to-use interfaces for complex products, and specialize in Operating Systems, Device Drivers, Storage, Disaster Recovery/Business Continuance, and Security.

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## **July 2014 – April 2017 – Vice President, Apeiron Data Systems**

- Co-inventor of the core intellectual property – two US Patents Issued/Approved.
- Architect of host to enclosure/ and NVMe drive protocols.
- Architect of sub-microsecond host-to-host protocol.
- Responsible for all host-side software:
  - Designer and author of Linux/Windows/ARTS device drivers > 50,000 LOC.
  - HBA (host hardware interface) support.
  - Transparent NVMe protocol support.
  - HBA, enclosure, and drive configuration, firmware download, management, etc.
- Designer and author of virtual volume and three-way mirror/replication.
- Designer and author of performance measuring and reporting.
- Author of fifty Linux shell command utilities supporting product management, configuration, diagnostics, debugging utilities, data integrity, and other tests.
- NVM Express Organization Representative.
- Member of Executive Staff

## **July 2013 – February 2015 – Consultant, SanDisk**

- Consulted on UFS host and device design, development, debug, and test
- Developed bring-up/conformance/performance tools and drivers for NVMe and UFS

## **September 2011 – July 2013 – Firmware Lead, PMC-Sierra**

- Responsible for SCSI firmware for SAS and PCI Express FLASH chips
- Primary developer of SCSI target code for PMC chipsets
- Responsible for internal and customer-facing technical documentation

### **November 2010 – September 2011 – Principal Consultant, MSB Associates**

- Provided technical consulting services for several clients on projects including:
- Firmware development for SAS-to-FLASH and PCI Express-to-FLASH devices
  - Performance analysis for Fibre Channel-based data acquisition system
  - FC, SAS, AHCI, SCSI-loopback target and initiator drivers for proprietary RTOS
  - Developed POSIX/Linux compatibility routines for proprietary RTOS
  - Porting of FreeBSD filesystems to proprietary RTOS
  - Development of numerous SCSI-conformance and compatibility tests
  - Developed USB bus and device drivers for proprietary RTOS
  - Created 1, 10, and 40 GigE device drivers for proprietary RTOS
  - Development of websites and databases for BSA Units and District
  - Development of thin client and server architecture, hardware, and software for a developing-country's school system

### **August 2008 – November 2010 – Storage Architect/Designer, Network Appliance**

- Architected, designed and led a team to create an FC to SAS Storage Bridge for MetroCluster remote data mirroring for business continuance and disaster recovery.
- Developed architecture and methodology for modularization of NetApp's core technology (DataONTAP).
- Assisted porting FC and SAS drivers to FreeBSD.

### **October 2005 - Owner, Ark Systems Corporation**

- Invented and created company's products and technology,
- Signed up business partners and investors.
- Developed IBM mainframe log capture product for LogLogic Corporation.
- Consulted with Network Appliance Corporation to assimilate, debug, and document defunct supplier's storage modules and Linux firmware.
- Provided expert witness consulting to in Patent infringement cases.
- Author of technical book on Computer Storage Systems (in process).

### **May 2000 - October 2005 – Senior Director, Staff to President, LSI Logic / Engenio**

- Ran the LSI Logic Storage Systems Milpitas Development Center.
- Handled development, debugging, testing, technical and marketing documentation, and support for the *ContinuStor Director* (CSD) product.
- Staff to the President, facilitating and participating in critical projects, including adding Serial ATA (SATA) and iSCSI support to LSI Logic's flagship product lines.
- Participated in executive staff strategic planning, budgeting, DR/BC, product roadmaps, employee satisfaction, IPO, spin-off, and internationalization.
- Provided business, technical, and project consulting to Engineering, Marketing, and Advanced Architecture.

### **January 1995 - May 2000 – Founder, Ark Research Corporation**

- Founded the company to develop and market advanced storage subsystems for the open systems market. Our product transparently added advanced functionality such as remote data mirroring to existing server and storage configurations with no changes to existing systems and applications.
- As founder, designed and personally developed most the product's operating system, networking, application code, and documentation.
- Raised seed, first and second round venture capital funding, and managed all the administrative activities -- company startup, facilities, information technology, finance, personnel, insurance, 401K, payroll, investor relations, and served on the Board of Directors.

### April 1991 - June 1994 -- Vice President, Andor Systems, Inc.

- Developed, manufactured, and marketed *CacheXchange* (CXC), a mainframe storage subsystem for Direct Access Storage Device (DASD) global caching and disaster recovery.
- Reporting to the President, was responsible for product development, the architectural integrity of the product, and plans and designs for future products.
- With less than ten percent of the capital and personnel of our smallest competitor, brought an extremely complex hardware/software product to market.
- Developed CXC's internal caching operating system, including all Remote Dual Copy/DASD code (the world's first implementation).
- Contributed to high-level technical support for sales support and customers, and participated in product testing performance tuning, and debug.
- Multiple Patents filed.

### July 1981 - April 1991 -- Founder, Kolinar Corporation (Relay Technology)

- Founded Kolinar Corporation to develop and market productivity tools for the IBM VM and MVS marketplace.
- Released over six products in multiple versions into the marketplace. Two won ICP awards. Many industry experts considered XMENU (a product I conceived and wrote) the *de facto* industry standard for VM windowing and terminal interaction.
- Developed and marketed systems and applications-enabling products for the IBM operating system environment, and operating system extensions.
- Directed product development, product support, customer support, documentation, and two computer centers.
- Managed the conversion of all company products to the IBM extended architecture environment, requiring significant changes to twelve products, including the rewriting of four products.
- Responsible for the conversion of all documentation to the IBM/BookMaster format (a precursor to HTML).
- Brought six divergent technology groups together and instilled a strong sense of cooperation, dedication, and loyalty into the group.

### September 1972 – June 1975 – Cooper Union, BSEE program

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#### Certifications

Certified Information System Security Professional (CISSP)  
DRII Certified Business Continuity Planner (CBCP)  
Storage Networking Industry Association (SCSA, SCSP, SCSE)  
BSA Wood Badge Leadership Training  
US Amateur Radio (Extra) license (AF6FO)

#### Other Activities

Co-author of "*VM Applications Handbook*," and "*The REXX Handbook*."  
Speaker at many industry functions -- keynote speaker at technical workshops.  
Taught many technical classes, including classes in Japan, Italy, England, and Germany.  
Served on computer planning and acquisition committee for local public television station -- Helped in fund-raising for homeless charity and college building fund.  
Acted as advisor to several start-up companies.  
Member of AMA, ACM, IEEE, AES, and several regional technical groups.  
Own private state-of-the-art digital recording/music studio. Contributed to music recordings as composer, performer, producer, and engineer.  
Served on BSA Troop and District Committees. Regularly participated and scheduled Eagle Scout Project and Final Boards of Review. Merit Badge Counselor.  
Director, Cameron Estates Community Services District.