Rodney D. Van Meter III

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Research Interests

My current research interests are post-Moore's Law computer architecture, including quantum computer architecture, and All-IP computer architectures. Prior accomplishments include research on network-based storage systems leading to the iSCSI IETF RFCs.

Awards, Funding and Collaborations

1. JSPS, "Kakenhi Kiban C", "Large-Scale, Heterogeneous Quantum Networks," 2009-12, three years.
2. Mori Memorial Fund, "IPsec with QKD," 2009 (with Prof. Jun Murai).
3. Mori Memorial Fund, "Science 2.0 and the Quantum Internet," 2008 (with Prof. Jun Murai).
4. U.S. National Science Foundation, "Topologically Fault-Tolerant Distributed Quantum Computer Architecture," 2008-2011, three years (collaborator; principal investigator Prof. Yoshihisa Yamamoto, Stanford University and National Institute of Informatics, Tokyo; principal collaborators include Dr. Thaddeus Ladd (NII/Stanford) and Dr. Austin Fowler (U. Melbourne, Australia)).
5. Unfunded collaborations with Assoc. Prof. Kae Nemoto (NII, Japan), Dr. Bill Munro (HP Labs, Bristol, UK), and Dr. Byung-Soo Choi (Ewha Woman's University, Seoul, South Korea).

Selected Publications

(Full list below.)

1. Yasuhiro Ohara, Shinji Imahori, and Rodney Van Meter, **MARA: Maximum Alternative Routing Algorithm**, Proc. INFOCOM 2009.
2. W. J. Munro, R. Van Meter, Sebastien G. R. Louis, and Kae Nemoto, **High-Bandwidth Hybrid Quantum Repeater**, Phys. Rev. Letters 101, 040502, July 2008. Selected for Virtual J. Quantum Inf. 8(8), Aug. 2008.
3. Rodney Van Meter, Thaddeus D. Ladd, W. J. Munro and Kae Nemoto, **System Design for a Long-Line Quantum Repeater**, IEEE/ACM Transactions on Networking, to appear.
4. Rodney Van Meter, Kae Nemoto, and W. J. Munro, **Communication Links for Distributed Quantum Computation**, IEEE Transactions on Computers, 56(12), 1643–1653, Dec. 2007.
5. Rodney Van Meter, W. J. Munro, Kae Nemoto and Kohei M. Itoh, **Distributed Arithmetic on a Quantum Multicomputer**, International Symposium on Computer Architecture (ISCA) June 2006.
6. Rodney Van Meter and Kohei M. Itoh, **Fast Quantum Modular Exponentiation**, Physical Review A, 71(5), 052320, May 2005.
7. Garth Gibson and Rodney Van Meter, **Network Attached Storage Architecture**, Communications of the ACM, Nov. 2000.
8. Rodney Van Meter and Minxi Gao, **Latency Management in Storage Systems**, Proc. Fourth Symposium on Operating Systems Design and Implementation (OSDI 4), Oct. 2000.

9. Rodney Van Meter, Gregory G. Finn and Steve Hotz, **VISA: Netstation's Virtual Internet SCSI Adapter** Proc. Eighth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS VIII), Oct. 1998.

10. Rodney Van Meter, **Observing the Effects of Multi-Zone Disks** Proc. Usenix 1997 Annual Technical Conference, Jan. 1997.

Education

- Ph.D., Keio University, Yokohama, Japan, Sept. 2006. Studied quantum computing, including quantum computer architecture and the design and efficient, architecture-adapted implementation of quantum algorithmic building blocks such as adders. Thesis, **Architecture of a Quantum Multicomputer Optimized for Shor's Factoring Algorithm**. Advisers Fumio Teraoka (computer science) and Kohei M. Itoh (applied physics and physico-informatics).

- Master of Science, Computer Engineering, University of Southern California, December 1991. Coursework included advanced operating systems, advanced computer architecture, parallel processing and distributed systems and networking topics. Served as the teaching assistant for advanced operating systems.

- Bachelor of Science, Engineering and Applied Science, California Institute of Technology, June 1986. Coursework included electrical engineering, optics, potentialities and limitations of computing machines, and microprocessor systems.

Work Experience

- April 2007 - present: **Keio University, Shonan Fujisawa Campus**, Fujisawa, Japan.

  Assistant Professor of Environment and Information Systems. Research areas include quantum computing and quantum networking, unconventional computing architecture, and large-scale distributed mass storage systems.

  - Appointed part-time lecturer for Chuo University, Waseda University, and the Graduate School of Information Security, as part of the Leading Edge IT Specialist education program.

- October 2006 - March 2007: **National Institute of Informatics**, Tokyo, Japan.

  Research Staff. Conducted research on quantum repeaters.

- April 2004 - June 2006: **CREST-JST**, Keio University, Yokohama, Japan.

  Research Assistant. Worked on quantum computing architectures and algorithms, with focus on scalability, in the group of Prof. Kohei M. Itoh.

- January 2001 - April 2003: **Nokia Networks**, Mountain View, CA.

  Network Platforms Software Architect. Participated in definition of product roadmaps, with emphasis on performance, for 3G packet network elements such as SGSN and GGSN. Evaluated new technologies such as ASIC-based and network processor-based packet processing. Conducted technical due diligence on acquisition of Amber Networks. Championed and architected a new software approach which more than quadrupled the performance of some network elements. Interface to Open Source Development Labs' Carrier Grade Linux working group; chair of Proof of Concept subgroup. Selected for Nokia Designer course, a training course for top one percent of company's engineers.

- September 1999 - January 2001: **Network Alchemy (now Nokia)**, Santa Cruz, CA.

  VPN Gateway Team Leader. Led delivery of 2.0 software for clustered IPSEC VPN gateway. Primary technical focus for 2.0 was clustered routing. Managed four to six engineers, participated in bug tracking and fixing, ran builds, and managed source code base.

- January 1998 - September 1999: **Quantum Corp.**, Milpitas, CA.

  Network Storage Architect, network storage group. Developed new, intelligent, network-attached storage architectures with the intent to significantly affect the way data is shared and accessed on computer networks. Responsibilities included requirements and design of the entire networking infrastructure, from transport protocols to management and physical topologies; system prototyping and simulation in Java, C, C++, Tcl; also, mentoring junior engineers and interfacing to industry groups. Conducted collaborative experiments with Adaptec and 3com that led directly to the development of iSCSI. Selected to attend Quantum Technology Symposium, generally limited to top ten percent of engineers.

- April 1995 - December 1997: **University of Southern California, Information Sciences Institute**, Marina del Rey, CA.

  Computer Scientist, Netstation project. Developed a new computer system architecture based on the concept of network-attached peripherals (NAPs). Duties included defining and implementing security mechanisms and application-layer network protocols for NAPs, including the frame buffer, keyboard, disk drive and camera. Modified the MIT X server to support network-attached frame buffers. Implemented a new file system to support direct device-to-device data transfer. Interfaced to the National Storage Industry Consortium's working group on Network-Attached Secure Disks.

- March 1992 - March 1995: **Asaca Corp.**, Hino-shi, Tokyo, Japan.

  Chief Software Engineer. Designed and implemented the firmware for the SCSI controllers for a high-speed magneto-optical disk drive and an extensible tape autochanger system for the mass storage market. Helped define the system architecture for the autochanger system. Modified SunOS device drivers to support these devices. Participated in the support for customer integration and marketing through direct contact with customers and writing documentation.

  Participated in the evaluation and selection of AMASS, a hierarchical storage management system, as a product to be OEMed in Japan. Educated several engineers in Unix fundamentals and systems administration skills, and helped develop the procedures for installing and supporting AMASS.

  Represented ASACA and its sister company, ShibaSoku, at numerous trade shows in Japan and the U.S.

- June 1988 - February 1992: **USC/ISI**.

  Programmer, MOSIS project. Participated in the porting and extension of Ron Ayres' ICL language. Translated VAX assembler into a portable intermediate form and added new features to the language, including a variable-sized memory allocator and garbage collector.

  Created forms and reports for the MOSIS accounting database in Oracle.

- June 1986 - June 1988: **USC/ISI**.

  Systems Programmer, Information Processing Center. Provided 24-hour support for a large VMS VAXcluster, including backup procedures, TCP/IP and DECnet networking and email. Also supported Unix (4.3 BSD, SunOS, HP/UX), Symbolics and TI Lisp machines, Tops-20, and a Connection Machine-2.

- 1987 - present: **Hax, Ltd.**

  Partner. Occasional systems consulting to the computer graphics and movie visual effects industries, including system and network administration, security software, computer graphics, and SCSI interface firmware.

Teaching Experience

- April 2007–present: "System Software" (spring, graduate level), "Computer Architecture" (fall, undergraduate), "Network Programming in C" (fall, undergraduate), and "Internet Evolution and Possibilities" (fall, graduate, from fall 2008, with Prof. Jun Murai). Both graduate classes are part of the "Leading Edge IT Specialist" program, broadcast via the Internet to several other leading universities in Japan.

- Jun. 2005: WIDE Project School of Internet, "Introduction to Quantum Computing", a 3-day intensive short course on quantum computing offered via satellite and Internet. Attended by approximately fifty students from Nepal, Indonesia, Laos, Thailand, Japan, Malaysia, and Bangladesh.

- Sept. 2004: U. Aizu, “Introduction to Quantum Computing”, a 3-day intensive short course on quantum computing offered to U. Aizu students for credit.
- Rodney Van Meter and Paul Massiglia, “From Physics to File Systems”, SC’99, Nov. 1999, full day tutorial.
- Spring, 1997: University of Southern California. **Instructor** for CS558, “Internetworking and Distributed Systems Laboratory”, a graduate-level class teaching systems administration and computer systems and networking research skills.

Industry and Academic Community Service

- Member of the executive committee for the IEEE Technical Committee on Mass Storage Systems since Oct. 1997.
- Program committees
  - USENIX Symposium on File and Storage Technologies (FAST):
    First, Jan. 2002; Fourth, Dec. 2005.
  - IEEE International Security in Storage Workshop (SISW):
    First, Dec. 2002; Third, Dec. 2005.
  - SC2004 (Supercomputing): Nov. 2004.
  - IEEE International Conference on Networking, Architecture, and Storage (NAS 2007), 2007.
  - International Conference on Future Internet Technologies (CFI), June, 2008; June, 2009.
  - Faculty for Second AsiaFI School on Architecture and Building Blocks, August, 2009.
  - Standing program committee member for NASA Goddard Conference on Mass Storage Systems and Technologies and IEEE Mass Storage Systems Symposium, 1998-present. Tutorials chair, 1999. Publications co-chair, 2003.
- Working groups
  - WIDE Project Area Director, March 2008 – present.
  - Chair of the Open Source Development Lab Carrier Grade Linux Proof of Concept working group, fall 2002 – spring 2003.
  - First chair of the Storage Networking Industry Association’s Working Group on Network Protocols, 1998.
- Reviewer for ACM Multimedia (1994), SOSP (1995, 2003), INFOCOM (1997, 2002), ASPLOS (2002), IBM Systems Journal (2002), Comm. of the ACM (2005), IEEE Trans. on Computers (2006, 2007, 2008), SC06 (2006), Quantum Information Processing (2007).
- Member of AAAS, ACM, IEEE, and USENIX.

Personal

- U.S. citizen.
- Passed the second-highest level of the national Japanese language ability test.

Publications, Presentations and Patents

Refereed Journals and Conferences With Proceedings

1. Hajime Tazaki, Rodney Van Meter, Ryuji Wakikawa, Thirapon Wongsaardsakul, Kanchana Kanchanasut, Marcelo Dias de Amorim and Jun Murai, **Selecting an Appropriate Routing Protocol for In-Field MANEMO Experiments**, Proc. ACM International Symposium on Performance Evaluation of Wireless Ad Hoc, Sensor, and Ubiquitous Networks (PE-WASUN), Oct. 2009, to appear.

2. Rodney Van Meter, Thaddeus D. Ladd, W. J. Munro and Kae Nemoto, **System Design for a Long-Line Quantum Repeater**, *IEEE/ACM Transactions on Networking*, 17(3), 1002–1013, Digital Object Identifier 10.1109/TNET.2008.927260, Jun. 2009.

3. Yasuhiro Ohara, Shinji Imahori, and Rodney Van Meter, **MARA: Maximum Alternative Routing Algorithm**, Proc. INFOCOM 2009.

4. Liang Jiang, Jacob M. Taylor, Kae Nemoto, William J. Munro, Rodney Van Meter, and Mikhail D. Lukin, **Quantum Repeater with Encoding**, Phys. Rev. A 79, 032325, March 2009.

5. W. J. Munro, R. Van Meter, Sebastien G. R. Louis, and Kae Nemoto, **High-Bandwidth Hybrid Quantum Repeater**, Phys. Rev. Letters 101, 040502, July 2008. Selected for Virtual J. Quantum Inf. 8(8), Aug. 2008.

6. R. Van Meter, W.J. Munro, and K. Nemoto, **Architecture of a Quantum Multicomputer**, Third Workshop on Theory of Quantum Computation, Communication, and Cryptography (TQC 2008), 2008.

7. Rodney Van Meter, W. J. Munro, Kae Nemoto and Kohei M. Itoh, **Arithmetic on a Distributed-Memory Quantum Multicomputer**, ACM J. of Emerging Technologies in Computing Systems (JETC), 3(4), Jan. 2008.

8. Rodney Van Meter, Kae Nemoto, and W. J. Munro, **Communication Links for Distributed Quantum Computation**, IEEE Transactions on Computers, 56(12), 1643–1653, Dec. 2007.

9. Rodney Van Meter, Kae Nemoto, and W. J. Munro, **Serial Links for Distributed Quantum Computation**, Proc. Int. Conf. on Quantum Communication, Measurement and Computing (QCMC) 2006.

10. W.J. Munro, Samuel L. Braunstein, T.D. Ladd, Sebastien G.R. Louis, G.J. Milburn, C.R. Myers, Kae Nemoto, Marcus Silva, T.P. Spiller, R. Van Meter, P. van Loock and Y. Yamamoto, **Qubus Computation**, Proc. Int. Conf. on Quantum Communication, Measurement and Computation (QCMC) 2006.

11. Rodney Van Meter, W. J. Munro, Kae Nemoto and Kohei M. Itoh, **Distributed Arithmetic on a Quantum Multicomputer**, International Symposium on Computer Architecture (ISCA) June 2006.

12. Rodney Van Meter, Kohei M. Itoh and Thaddeus D. Ladd, **Architecture-Dependent Execution Time of Shor's Algorithm**, Proc. Mesoscopic Superconductivity and Spintronics (MS+S2006), Feb. 2006.

13. Rodney Van Meter and Mark Oskin, **Architectural Implications of Quantum Computing Technologies**, ACM Journal of Emerging Technologies in Computing Systems (JETC), 2(1), Jan. 2006.

14. Rodney Van Meter and Kohei M. Itoh, **Fast Quantum Modular Exponentiation**, Physical Review A, 71(5), 052320, May 2005.

15. Rodney Van Meter, **Trading Classical for Quantum Computation Using Indirection**, Proc. International Symposium on Mesoscopic Superconductivity and Spintronics (MS+S2004), Mar. 2004.

16. Garth Gibson and Rodney Van Meter, **Network Attached Storage Architecture**, Communications of the ACM, Nov. 2000.

17. Rodney Van Meter and Minxi Gao, **Latency Management in Storage Systems**, Proc. Fourth Symposium on Operating Systems Design and Implementation (OSDI 4), Oct. 2000.

18. Rodney Van Meter and Paul Massiglia, **From Physics to File Systems**, SC'99, Nov. 1999, full day tutorial.

19. Rodney Van Meter, Gregory G. Finn and Steve Hotz, **VISA: Netstation's Virtual Internet SCSI Adapter** Proc. Eighth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS VIII), Oct. 1998.

20. Rodney Van Meter, **SLEDs: Storage Latency Estimation Descriptors** Proc. Sixth NASA Goddard Conference on Mass Storage Systems and Technologies in conjuction with Fifteenth IEEE Mass Storage Symposium, Mar. 1998.

21. Steve Hotz, Rodney Van Meter and Gregory Finn, **Internet Protocols for Network-Attached Peripherals** Proc. Sixth NASA Goddard Conference on Mass Storage Systems and Technologies in conjuction with Fifteenth IEEE Mass Storage Symposium, Mar. 1998.

22. Gregory Finn, Craig Milo Rogers and Rodney Van Meter, **Datagram Forwarding via Stateless Internetwork Switching** Proc. IEEE Communications Society and NetWorld+Interop '97, Engineers Conference on Broadband Access - Technologies, Systems and Services, May 1997.

23. Rodney Van Meter, **Observing the Effects of Multi-Zone Disks** Proc. Usenix 1997 Annual Technical Conference, Jan. 1997.

24. Rodney Van Meter, Steve Hotz and Gregory Finn, **Derived Virtual Devices: A Secure Distributed File System Mechanism** Proc. Fifth NASA Goddard Conference on Mass Storage Systems and Technologies, Sept. 1996.

25. Rodney Van Meter, **Storage Media Pipelining: Making Good Use of Fine-Grained Media** Proc. Third NASA Goddard Conference on Mass Storage Systems and Technologies, Oct. 1993.

26. Takashi Nakagomi, Mark Holzbach, Rodney Van Meter III and Sanjay Ranade, **Re-Defining the Storage Hierarchy: An Ultra-Fast Magneto-Optical Disk Drive** Proc. Twelfth IEEE Symposium on Mass Storage Systems, April 1993.

Other Publications

1. Byung-Soo Choi and Rodney Van Meter, **On the Effect of Quantum Interaction Distance on the Quantum Addition Circuits**, 8th Asian Conference on Quantum Information Science (AQIS), Aug. 2008.

2. Agung Trisetyarso, Rodney Van Meter, and Kohei M. Itoh, **A Measurement-Based Form of the Out-of-Place Quantum Carry-Lookahead Adder**, 8th Asian Conference on Quantum Information Science (AQIS), Aug. 2008.

3. R. Van Meter and Byung-Soo Choi, **Applications of an Entangled Quantum Internet**, Third International Conference on Future Internet Technologies (CFI08), Jun. 2008.

4. K. Nemoto, R. Van Meter, S.G.R Louis, and W.J. Munro, **A high bandwidth hybrid quantum repeater**, Third Workshop on Theory of Quantum Computation, Communication, and Cryptography (TQC 2008), 2008.

5. Thaddeus D. Ladd, Rodney Van Meter, Austin Fowler, William J. Munro, Kae Nemoto, and Yoshihisa Yamamoto, **Scalable Architecture for Fault-Tolerant Quantum Computers based on Semiconductor Microphotonics**, First International Conference on Quantum Error Correction, Dec. 2007.

6. Rodney Van Meter, Jacob M. Taylor, and Liang Jiang, **Distributed Quantum Error Correction**, First International Conference on Quantum Error Correction, Dec. 2007.

7. Rodney Van Meter, Kae Nemoto, and W. J. Munro, **Architecture of a Quantum Multicomputer**, Asian Conference on Quantum Information Science (AQIS), Aug. 2007.

8. Takahiko Satoh, Shota Nagayama, and Rodney Van Meter, **Reversible Ternary Adder for Quantum Computation**, Asian Conference on Quantum Information Science (AQIS), Aug. 2007.

9. Rodney Van Meter, **Fast Quantum Modular Exponentiation**, ERATO Conference on Quantum Information Science 2004 (EQIS04), poster, Sept. 2004.

10. Rodney Van Meter, **Communications Topology and Distribution of the Quantum Fourier Transform**, Proc. Tenth Quantum Information Technology Symposium (QIT10), May 2004.

11. Rodney Van Meter, Greg Finn, Steve Hotz and Dave Dyer, **Response to "the Collapsed LAN"** letter to the editor in ACM Computer Architecture News, Sept. 1997.

12. Rodney Van Meter, **Latency Management and Quality of Service in Storage Systems** White paper for NSF Workshop on Research & Development (R&D) Opportunities in Federal Information Services, May 13-15, 1997.

13. Rodney Van Meter, Steve Hotz and Gregory G. Finn, **Task Force on Network Storage Architecture: Internet-attached storage devices** Proc. Hawaii International Conference on System Sciences, Jan. 1997. Position paper for the task force to meet in conjunction with the conference.

14. Gregory Finn, Steve Hotz and Rodney Van Meter, **The Impact of a Zero-Scan Internet Checksumming Mechanism** ACM Computer Communication Review, Oct. 1996.

15. Rodney Van Meter, **A Brief Survey of Current Work on Network-Attached Peripherals** ACM Operating Systems Review, January '96.

16. Rodney Van Meter, editor, **comp.arch.storage Usenet newsgroup Frequently Asked Questions (FAQ)**, approximately 75 pages of storage-related material available over the Internet. Editor from July 1994 to mid-1998; currently dormant.

Submitted and In Preparation

1. Rodney Van Meter, Thaddeus D. Ladd, Austin G. Fowler, and Yoshihisa Yamamoto, **Distributed Quantum Computation Architecture Using Semiconductor Nanophotonics**, submitted.

2. Byung-Soo Choi and Rodney Van Meter, **Effects of Interaction Distance on Quantum Addition Circuits**, arXiv:0809.4317v1 [quant-ph], in preparation.

3. Agung Trisetyarso and Rodney Van Meter, **Circuit Design for A Measurement-Based Quantum Carry-Lookahead Adder**, arXiv:0903.0748v1 [quant-ph], in preparation.

Public Presentations

1. "Architecture of a Quantum Multicomputer," Imai SORST Quantum Project, Tokyo, Jul. 21, 2006.

2. "Architecture of a Quantum Multicomputer," Northeastern University, Boston, MA, Jun. 23, 2006.

3. "Architecture of a Quantum Multicomputer," Akamai, Cambridge, MA, Jun. 21, 2006.

4. "Fast Quantum Modular Exponentiation," Caltech Workshop on Classical and Quantum Information Security (CQIS), Dec. 2005.

5. "The Design of a Quantum Multicomputer," USC/ISI, Dec. 2005.

6. "Fast Quantum Modular Exponentiation," BBN, Aug. 2005.

7. "Quantum Computing *Systems*: State of the Art, Summer 2005," Carnegie Mellon University, Aug. 2005.

8. "Fast Quantum Modular Exponentiation," HP Labs, Bristol, Jan. 2005.

9. "Fast Quantum Modular Exponentiation," Oxford University, Jan. 2005.

10. "Fast Quantum Modular Exponentiation," MIT, Nov. 2004.

11. "Accelerating Shor's Algorithm Using Fast Quantum Modular Exponentiation," 2004 Workshop on Information Security Research (invited), Fukuoka, Japan, Oct. 2, 2004.

12. "Introduction to Quantum Computing," Keio Shonan Fujisawa Campus, June 3, 2004 (in Japanese).

13. "Trading Classical for Quantum Computation Using Indirection," ERATO Kyoto, April 15, 2004 (in Japanese).

14. "A Computer Systems Research Agenda for Quantum Computing," Nara Institute of Science and Technology, April 16, 2004 (in Japanese).

15. "Communications Topology and Distribution of the Quantum Fourier Transform," National Institute of Informatics, April 22, 2004.

16. “A Computer Systems Research Agenda for Quantum Computing,” NTT Basic Research Laboratory, October 7, 2003.
17. “Whither the Mobile Internet: Storage and Mobile Terminals,” THIC Meeting, San Jose, March 4, 2003.
18. “Will 3G Truly be the Wireless Internet?” USC/ISI, June 11, 2002.
19. “The Convergence of Storage and Networking: Will it be SAN or NAS?” USENIX 2000 Annual Technical Conference invited talk, San Diego, CA, June 22, 2000.
20. “Possibilities and Pitfalls in the Network Attached Peripheral,” THIC Meeting, Del Mar, CA, January 20, 1998.
21. “System Architectures Using Network Attached Peripherals,” USC Integrated Media Systems Center, October 30, 1997.
22. “VISA: Netstation’s Virtual Internet SCSI Adapter,” HP Labs, July 15, 1997.
23. “VISA: Netstation’s Virtual Internet SCSI Adapter,” USC/ISI division 7 seminar, July 3, 1997.
24. “Derived Virtual Devices: A Secure Distributed File System Mechanism,” 1996 Carnegie Mellon University Parallel Data Systems Workshop and Retreat, Wisp Resort, Deep Creek, MD, Sept. 24, 1996.
25. “Derived Virtual Devices: A Protection-Enforcement Mechanism for Network-Attached Peripherals,” USC/ISI division 7 seminar, Marina del Rey, CA, Jan. 4, 1996.
26. “Netstation Project,” National Storage Industry Consortium’s working group on Network Attached Storage Devices, Santa Clara University, Santa Clara, CA, Sept. 1, 1995.

Patents

- U.S. Patent #6,964,008, “Data checksum method and apparatus,” granted Nov. 8, 2005.