

Garth R. Goodson

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RESEARCH INTERESTS

My research interests include distributed storage and file systems, as well as, high-performance network applications and operating systems.

EDUCATION

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Ph.D. Candidate in Electrical and Computer Engineering, (expected: August 2004)

- Dissertation Topic: “Efficient, flexible consistency for highly fault tolerant storage”
- Advisor: Gregory Ganger

M.S. in Electrical and Computer Engineering, May 2000

- Thesis Topic: “I/O infrastructure support for network-attached storage devices”

B.S. in Electrical and Computer Engineering, May 1998

ACADEMIC EXPERIENCE

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Research Assistant

May, 1998 - present

Includes current Ph.D. research, Ph.D. and Masters level coursework.

- Designed a decentralized storage consistency protocol family capable of tolerating many fault and system models; from crash clients and servers to Byzantine clients and servers, in both asynchronous and synchronous environments. Implemented a survivable block-store using erasure-codes combined with this consistency protocol family.
- Designed and implemented a file system for the PASIS system. PASIS is a survivable storage system that can guarantee the confidentiality, integrity, and availability of stored data even when some storage nodes fail or are compromised.
- Implemented the RPC and disk I/O modules for the Self-Securing Storage Systems (S4) project. S4 is a NASD like storage system with strong guarantees of data security and availability (even of deleted objects).
- Added network interface card (NIC) support for application-level networking; which involved the modification of the NIC firmware and OS drivers.

Teaching Assistant

Shared responsibility for exams, homework, projects, and grading.

- *Introduction to storage systems (18-546)* **Spring 2001, Spring 2002**
Designed a class project for building an NFS server. Instructor: Gregory Ganger.
- *Introduction to embedded systems (18-349)* **Spring 1998**
Supervised students during labs. Instructors: David Nagle, Gregory Ganger.

PUBLICATIONS

Garth R. Goodson, Jay J. Wylie, Gregory R. Ganger, Michael K. Reiter. *Efficient Byzantine-tolerant erasure-coded storage*. The International Conference of Dependable Systems and Networks (Florence, Italy, 28 June–01 July), 2004.

Garth R. Goodson, Jay J. Wylie, Gregory R. Ganger, Michael K. Reiter. *A protocol family for versatile survivable storage infrastructures*. Carnegie Mellon University Parallel Data Lab Technical Report CMU-PDL-03-103, December 2003.

Adam G. Pennington, John D. Strunk, John L. Griffin, Craig A. N. Soules, Garth R. Goodson, Gregory R. Ganger. *Storage-based intrusion detection: watching storage activity for suspicious behavior*. USENIX Security (Washington, DC, 06–08 August 2003), USENIX Association, 2003.

Craig A. N. Soules, Garth R. Goodson, John D. Strunk, and Gregory R. Ganger. *Metadata effi-*

ciency in a comprehensive versioning file system. Conference on File and Storage Technologies (San Francisco, CA, 31 March–02 April 2003), pages 43-57. USENIX Association, 2003.

Garth R. Goodson, Jay J. Wylie, Gregory R. Ganger, Mike K. Reiter. *Decentralized storage consistency via versioning servers.* Technical Report CMU-CS-02-180. Carnegie Mellon University, September 2002.

John D. Strunk, Garth R. Goodson, Adam G. Pennington, Craig A. N. Soules, and Gregory R. Ganger. *Intrusion detection, diagnosis, and recovery with self-securing storage.* Technical report CMU-CS-02-140. Carnegie-Mellon University, May 2002.

Gregory R. Ganger, Pradeep K. Khosla, Mehmet Bakkaloglu, Michael W. Bigrigg, Garth R. Goodson, Semih Oguz, Vijay Pandurangan, Craig A. N. Soules, John D. Strunk, Jay J. Wylie. *Survivable storage systems.* DARPA Information Survivability Conference and Exposition (Anaheim, CA, 12–14 June 2001), pages 184-195 vol 2. IEEE, 2001.

John D. Strunk, Garth R. Goodson, Michael L. Scheinholtz, Craig A. N. Soules, and Gregory R. Ganger. *Self-securing storage: Protecting data in compromised systems.* Operating Systems Design and Implementation (San Diego, CA, 23–25 October 2000), pages 165-180. USENIX Association, 2000.

PROFESSIONAL
EXPERIENCE

IBM Research, Almaden
San Jose, California

Summer 2002

- I worked with the Storage Systems group on the Collective Intelligent Bricks project.
- I designed and implemented a recovery/repair protocol, within a simulator, for restoring data across a set of distributed storage-bricks.

IBM Research, Watson
Yorktown Heights, New York

Summer 2000

- I worked with the Advanced Operating System group on a new multiprocessor object-oriented operating system (K42).
- I was responsible for designing and implementing a high-performance application-level network interface within K42. This included an application-level TCP library and socket interface that communicated with network packet rings located in the kernel.

Intel
Hillsboro, Oregon

Summer 1997

- I worked on micro-architectural design and specification of the Merced GX motherboard chipset.
- I was responsible for designing and specifying the PCI data path and hardware configuration registers for the AGP bridge chip within the GX chipset.

COMPUTER SKILLS

- Languages: C, C++, Perl, Java, Unix shell scripts.
- Development skills: Threaded, networking, OS kernel, NFSv2 & NFSv3, large systems
- Operating systems: Unix/Linux/FreeBSD, Windows.

HONORS AND
AWARDS

- SOSF Student Research Competition Semi-finalist, 2003
- IBM Research Fellowship, 2002