Tim Deegan

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Skills

I design and build operating systems components. I have produced fast and reliable filesystem code and hypervisor features.

I like to work on difficult technical problems, ideally in a small team of engineers. I'm looking for a collaborative environment where I can work with, and learn from, smart and enthusiastic people.

I'm proficient in C on unix, but I also enjoy assembler (x86 and ARM), and am happy writing kernel code. For higher-level work I prefer python, but have used perl, bash, java, ocaml and some rust, and am always willing to learn something new. I'm familiar with the usual unix source control tools (git, mercurial) build systems (make, autotools), and debugging tools (gdb, valgrind). I use static analysis tools and performance profilers.

I have experience working with open-source communities, collaborating with other engineers and reviewing code. I enjoy mentoring junior engineers, and I supervise undergraduates for courses in operating systems and C.

Outside of working hours, I spend most of my time with my wife and primary school age son. We enjoy music, trips to nature reserves, and computer games.

Experience

2019– **Senior Research SDE, Microsoft Research**
I am part of Project Silica, a multidisciplinary team developing a new storage medium for archive data, using femtosecond lasers and quartz glass. I work on all kinds of software, from machine learning to embedded systems, to support the physicists and hardware engineers and help to turn a lab prototype into a working storage system.

2017–2019 **Principal Software Engineer, Amazon Web Services**
At Amazon, I worked on the S3 object store. I was one of the first members of the Cambridge S3 team and helped it to grow to 16 people in its first year. I worked mostly on on feature planning and prototyping, but also on operations and debugging production systems.

2011–2017 **Software Architect, Coho Data**
At Coho Data, I worked on the object storage layer of a storage array. I designed and implemented compression, checksumming, garbage collection and concurrency control features. I worked on journalling and crash recovery, and on performance analysis. I was involved in the architecture and design of other parts of the product.

2006–2015 Principal Software Engineer, XenSource / Citrix Systems
I spent nine years on the core development team of the Xen hypervisor, writing new code and reviewing designs and code for others. I wrote (with Michael Fetterman and others) Xen's shadow pagetable code, which gave Xen a performance advantage over other hypervisors for some time. I then worked on many other parts of the system: emulator support for 'real mode' code, saving and restoring virtual CPU state, BIOS/firmware bugs, and the port to ARMv8 processors.

2001–2006 PhD Student, University of Cambridge
My PhD thesis was on the DNS, suggesting a break between the administrative delegation of control and the distribution of the service itself. I measured how often records change in the public DNS and prototyped an improved nameserver.

2001 Secure Hosting Systems Administrator, Baltimore Technologies
I was part of a team running a high-security machine room. We hosted public-key cryptographic infrastructure for mobile phone vendors, government departments and financial institutions.

2000 Technical Hostmaster, University College Dublin
I ran the computer systems for the .ie top-level domain, including databases and DNS servers.

Education

2001–2006 PhD, Computer Science, University of Cambridge
My dissertation is available at tjd.phlegethon.org/words/thesis.html.

1995–1998 BA, Computer Science, University of Cambridge
In my final year I won the Olivetti and Oracle class prize.

Selected Publications

Strata: High-Performance Scalable Storage on Virtualized Non-volatile Memory.
B. Cully, J. Wires, D. Meyer, K. Jamieson, K. Fraser, T. Deegan, D. Stodden, G. Lefebvre, D. Ferstay and A. Warfield.
Proc. 12th FAST, pp. 17–31, February 2014.

Breaking Up is Hard to Do: Security and Functionality in a Commodity Hypervisor.
P. Colp, M. Nanavati, J. Zhu, W. Aiello, G. Coker, T. Deegan, P. Loscocco and A. Warfield.
Proc. 23rd ACM SOSP, October 2011.

Melange: creating a 'functional' Internet.
A. Madhavapeddy, A. Ho, T. Deegan, R. Sohan and D. Scott.
Proc. 2nd EuroSys, March 2007.

The Main Name System: An exercise in centralized computing.
T. Deegan, J. Crowcroft and A. Warfield.
ACM SIGCOMM CCR 35(5) pp. 5–13, October 2005.