# Andrew Brampton Ph.D.

*Developer - Architect - Researcher - Open source enthusiast*

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I'm looking for a position where I can make an impact, design the architecture and shape the technical direction. I'm looking for a challenge, where an existing application needs to scale, or a new application needs to be built from the ground up. I am passionate about technology, an analytical problem solver, and enjoy working on complex distributed systems. I'm hoping to use my knowledge and experience to lead a team, and grow the company.

## Skills

**Programming**

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|---|---|
| Advanced | Java, C, PHP and JavaScript |
| Casual | C++, Bash, Python, Pascal, Lua, C# and .Net, ASP, x86 ASM, and other miscellaneous languages |
| Frameworks | Spring IoC/MVC, Hibernate, JBoss/Tomcats, JMS (ActiveMQ/JBossMQ) and Android |
| Notes | Experienced developer, with strong Object-oriented knowledge. Skills range from kernel hacking to Android development, from web development to database optimisation. Has designed and implemented large scale distributed systems and robust applications that require a high availability. |

**Web Technologies**

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|---|---|
| Advanced | HTML5, CSS3, Mobile development, JavaScript, PHP, CGI, AJAX<br>Frameworks: jQuery, Kohana, Yii and Zend Framework. |

**Platforms**

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|---|---|
| Advanced | Linux (distro of choice Debian) and FreeBSD 4 and above |
| Above Average | Configuring and running Apache+PHP, MySQL, OpenLDAP, and other services |
| Notes | For the last 5 years I've almost exclusively used Linux PCs at work and home. |

**Just for fun**

| | |
|---|---|
| Languages | LaTeX, CoffeeScript, Groovy/Grails, Clojure |
| Software | Node.js, nginx, Redis and MongoDB |
| Platform | Amazon AWS (EC2/S3/EBS), Google App Engine |

## Open Source

In my free time I have contributed to numerous open source projects, and have even started a few myself. To name just a few I have had patches accepted by The Linux Kernel, The FreeBSD Project, PHP, Google Chrome, Google Android, Intel's Networking Drivers, HeidiSQL, and many more. In addition to this I have open sourced and made available numerous projects ranging from small little helper libraries, to larger network simulation and benchmarking tools. Check out my https://github.com/bramp/ for more information.

## Work History

July 2013 – *Current*

**Manager, Engineering** at Genesys

Now part of the Genesys team, with more resources and responsiblity, I continue to lead the development efforts in respect to Mobile. Creating new product lines to enable new functionality, for example, iBeacon, Passbook, Geo-fencing, MMS messaging.

*July 2013 SoundBite Communications was aquired by Genesys Telecommunications Laboratories*

Mar 2012 – *Current*

**Manager, Mobile Marketing Development** at SoundBite Communications

I now lead a cross-functional team of developers, system administrators and QA testers. I continue to define the technology and direction for the mobile marketing arm of SoundBite. This includes maintaining our high-volume SMS messaging platforms, developing our multiple mobile products, and overseeing the development of custom work.

*March 2012 2ergo Americas was aquired by SoundBite Communications*

Jun 2011 – Mar 2012

**Head of Technology** at 2ergo Americas

When I first joined 2ergo Americas, there was no technical leadership, and in my role of DevOps I quickly became the "go-to guy" for solving problems. After many months of fixing our processes, and directing our technologies decisions, I eased into the role of Head of Technology. My duties included ensuring 2ergo Americans had a unified technical vision, managing our developers and sysadmin staff, and growing the business. In the following 9 months, I planned and led the migration to a virtualised environment, designed a global messaging infrastructure, and headed the technical integration with SoundBite when they acquired 2ergo Americas in March 2012.

Oct 2010 – Jun 2011

**DevOps** at 2ergo Americas

*Development and operations*

I was responsible for maintaining over 50 servers and keeping everything running optimally. I entered the role with little hand-over, and spent the first few months learning and documenting the numerous systems. Eventually I got a handle and started to streamline and standardise the various platforms. This also included development work to improve the performance of the platforms to handle the growth of the business.

Oct 2007 – Oct 2010

**Research Associate** at Lancaster University

*Networking Researcher*

During the three years at Lancaster I have been involved in numerous projects, some of which involved working in small teams and others working alone. My tasks were typically research orientated (such as running and analysing experiments, and publishing my results), but in addition to this I have helped with teaching undergraduate and master's students. This included running seminars, supervising labs, marking coursework, and lecturing.

During this time, I worked on large scale distributed systems, content distribution networks, and low level optimisations of the Linux network stack.

## Education

2008 **Ph.D. in Computer Science, Lancaster University, UK**
Thesis: "The Impact of Highly Interactive Workloads on Video-on-Demand Systems"
Supervisor: Prof. Laurent Mathy
Available at: http://bramp.net/thesis
Research Interests: Content Distribution Networks, Peer-to-Peer, Autonomic Self-Organising Systems

2004 **B.Sc. (Hons) in Computer Science, Lancaster University, UK**
First class honours degree
Dissertation: "Peer-to-Peer Media Streaming"
Supervisor: Nicholas Race

## Projects

**Android Apps**
In my free time I have created a number of Android apps, Nando's finder, Scorer: The Score Keeper, and the most popular MusicGrid. The latter had over half a million installs in the first 6 months, has been reviewed on a BBC technology TV show, and continues to stay popular. All apps have an average rating of 4.5 out of 5 or higher, which shows my commitment to shipping quality, well thought out apps.

All apps are available for free on Google Play.

**Scaling a web-application**
2ergo hosts the mobile website for a large news organisation. When a big story breaks the site would experience an order of magnitude more traffic than normal. Because of this I was faced with improving an application that would normally only handle 70 page views per second, to handle 950 page views per second. By taking an holistic approach and measuring various parts of the system I made the following main improvement:

- Made the site easier to be cached by the web browser, to reduce unnecessary load.
- Reconfigured the front-end Apache servers to handle higher number of concurrent connections, and reduced the timeouts.
- Horizontally scaled the back-end (MySQL) database to have multiple redundant read-only copies of the data to reduce load on the master.
- Implemented multiple best-practices, such as degrading features, and caching solution (in this case Ehcache).

**Global Messaging Platform**
In 2011, 2ergo Americas delivered over half a billion SMS (text) messages to mobile devices in North and South America. To achieve this we have an internally built messaging platform. This platform is a JBoss clustered application using JMS between the various components. 2ergo group (the International part of the business), had deployed multiple different messaging platforms across Europe/Australia/Asia. I advocated for a standard messaging platform to be used by the company across all regions. Over the following 6 months I laid the ground work for the US platform to be rolled out and configured global. At the end of the project, 2ergo's global reach was now unified, which allowed for:

- Better global IT support, with each region being able to support the global platform.
- Simpler integration, as it was now possible for any region to send SMS messages into any other region.
- Standardisation, allowing the development teams in each region to contribute changes to the single core messaging platform.

## Research Projects

**Stealth Distributed Hash Table**
Designed, implemented and evaluated a new type of distributed hash table (DHT), a form of peer-to-peer network, which was designed to be more reliable than existing DHTs, and suitable for high performance applications.

- Created a Java based peer-to-peer network simulator, which could accurately model underlying network properties.
- Created a C++ implementation with LUA bindings, to allow the Stealth DHT to be used in a real environment.
- Used PlanetLab (a 650 node testbed, with hosts at 300+ sites across the Internet) to experiment with the DHT and to obtain more 'realistic' Internet results.

- The work produced numerous conference papers [7, 8, 9, 10, 11], a journal article [5], as well as all the source code being made available.

**Interactive Video-on-Demand**
To aid my research into interactive video-on-demand I required realistic workloads of users heavily seeking through a video. To this end I captured and served the 2006 FIFA World Cup (soccer), and recorded how users consumed the content.

- Created and maintained a Video-on-Demand (VoD) system using PHP and Flash video, including the development of tools and scripts to capture video, encode, and upload to the system.
- Created statistical models based on recorded user behaviour.
- Created and developed algorithms to improve prefetching and caching for interactive VoD.
- This work was published at conferences [6, 3], in a journal [4], and finally became the foundation of my Ph.D. thesis. In addition, all source code and recorded traces were released[1].

**10Gbit+ Networking on Multi-core platforms**
At the beginning of my postdoctoral research, I helped on a project which aimed to identify and remove bottlenecks associated with high speed networking on multi-processor or multi-core machines.

- Instrumented the Linux network stack, and used tools such as OProfile.
- Rewrote segments of the Linux kernel to improve TCP performance when used specifically on multi-core architectures.
- This project produced one paper [2], a network benchmarking tool[2], and a Ph.D. thesis for another student.

**High Performance Routing on Commodity Hardware**
Over the last two years, in my free time, I've been involved in a technology start-up whose aim is to create a high performance networking platform running on low-cost commodity hardware. I have been the chief architect and developer creating a flexible system able to sustain high packet throughputs. This work is based on a custom network engine written as a FreeBSD kernel module. Over the two years I have had extensive experience developing for the FreeBSD 7 and 8 kernels, and have managed to achieve almost linear scaling of packet forwarding with the number of cores, up to a tested rate of 40Mpps (packets per second) with throughputs easily exceeding 20Gbps. This networking platform has not yet been publicly announced, and it is our hope to get funding in the near future.

## References

"*It must be something to be the smartest person in the room in most rooms! Andrew is a brilliant developer and systems guru, and he's been an invaluable asset to our organization. He'll always tell it how it is, give 110%, and take full pride in any work he produces. He challenges the rest of the team to do the same, and he's the first to make extra time in an already full schedule to help is peers by sharing his limitless technical knowledge. I count on Andrew not only to move our business in a favorable technical direction, but also to help me exercise that developer part of my own brain on occasion. I thoroughly enjoy working with him and appreciate his contributions to the team.*" - March 2012 - Michael Scully, GM and Managing Director, 2ergo Americas, Inc

Read more at Linkedin. Contact details available on request.

[1] http://bramp.net/blog/flvtool-a-command-line-flash-video-file-flv-editor and http://www.rcdn.org/
[2] http://bramp.net/blog/threadnetperf-v1-0

# Publications


[1] Matthew Jakeman, Andrew Brampton, and Stephen Pink. Facilitating network auto configuration in next generation internet protocols. In *FutureNet II - Second international workshop on the network of the future in conjunction with IEEE Globecom*, December 2009.

[2] Matthew Faulkner, Andrew Brampton, and Stephen Pink. Evaluating the performance of network protocol processing on multi-core systems. In *International Conference on Advanced Information Networking and Applications (AINA)*, May 2009.

[3] Andrew MacQuire, Andrew Brampton, Michael Fry, Nicholas Race, and Laurent Mathy. A case for hybrid content distribution for interactive video-on-demand. In *International workshop on Future Multimedia Networking (FMN)*, September 2008.

[4] Andrew Brampton, Andrew MacQuire, Michael Fry, Idris Rai, Nicholas J. P. Race, and Laurent Mathy. Characterising and exploiting workloads of highly interactive video-on-demand. *Multimedia Systems Journal*, 2008.

[5] Andrew MacQuire, Andrew Brampton, Idris A. Rai, Nicholas J.P. Race, and Laurent Mathy. Authentication in stealth distributed hash tables. *Journal of Systems Architecture*, 54(6):607 – 618, 2008. Selection of best papers from the 32nd EUROMICRO Conference on [']Software Engineering and Advanced Applications' (SEAA 2006).

[6] Andrew Brampton, Andrew MacQuire, Idris Rai, Nicholas J. P. Race, Laurent Mathy, and Michael Fry. Characterising user interactivity for sports video-on-demand. In *International workshop on Network and Operating Systems Support for Digital Audio & Video (NOSSDAV)*, June 2007.

[7] Idris Rai, Andrew Brampton, Andrew MacQuire, and Laurent Mathy. Performance modelling of peer-to-peer routing. In *4th International Workshop on Peer-to-Peer Systems (HOTP2P)*, March 2007.

[8] Andrew Brampton, Andrew MacQuire, Idris Rai, Nicholas J. P. Race, and Laurent Mathy. Stealth distributed hash table: A robust and flexible super-peered dht. In *2nd Conference on Future Networking Technologies (CoNEXT)*, December 2006.

[9] Andrew MacQuire, Andrew Brampton, Idris Rai, Nicholas J. P. Race, and Laurent Mathy. Authentication in stealth distributed hash tables. In *32nd Euromicro Conference on Software Engineering and Advanced Applications*, August 2006.

[10] Andrew MacQuire, Andrew Brampton, Idris Rai, and Laurent Mathy. Performance analysis of stealth dht with mobile nodes. In *3rd International Workshop on Mobile Peer-to-Peer Computing (MP2P)*, pages 184–189, March 2006.

[11] Andrew Brampton, Andrew MacQuire, Idris Rai, Nicholas J. P. Race, and Laurent Mathy. Stealth distributed hash table: Unleashing the real potential of peer-to-peer. In *ACM Conference on Emerging Network Experiments and Technology (CoNEXT) (Student Workshop Session)*, October 2005.