Andrew Frederick Cowie

rmc, BEng

Leadership

Professional

Scaling up. Taking organizations to the next level, solving the scaling problems inherent when you build teams-of-teams, and employing engineering in non-traditional domains.

Personal

Determination to apply the extraordinary computing power we have at our command to real-world problems. Most people accept the world around them; engineers built that world and know we can do better.

Capabilities

Extensive Technology Background

Experience as a software developer, systems engineer, and management consultant, both in leadership roles and as a practising technologist. Extensive competence in improving organizational structures, optimizing infrastructure, and re-engineering systems.

Long experience with Linux, open source, and distributed systems. Remarkable success when troubleshooting, especially enterprise, e-commerce, and large-scale analytics platforms. Have designed network, compute, and storage infrastructure for cloud deployments and taken them from concept through provisioning into commercial operation. Grew the systems engineering capability at a major Australian bank and have grown multiple teams for developing and operating complex technologies.

Most recently led technology at a growing scale-up with responsibility for product features, compute infrastructure, operations, cyber security, and restoring the ability to deliver innovations to customers.

Business Process Improvement

Experienced in change management, process development, and using procedures to execute massive changes and upgrades to mission critical systems. Emphasis on successfully integrating people with processes. Track record of making sound decisions in time-critical situations.

Consulting Experience

Have worked at levels ranging from boardroom to implementation. Extensive work in project review, engineering design, and improving operations practises. Solid understanding of how to work within processes to achieve goals. Skilled at financial modelling, cost control, and formulation of arguments in business plan form. Have also facilitated growth of startups and young companies, especially scaling IT systems from initial pilot projects to heavy loaded production platforms.

Open Source

Long time open source contributor and advocate. Lead author and maintainer of several projects, and broad contributions to many others.

Considerable software development expertise writing end-user programs, web applications, and systems tools. Recent focus has been in the Rust programming language with Amazon- and GCP-based cloud infrastructure, informed by a background in C, Shell, Perl, Python, Java, and Haskell.

Accomplished Communicator

Strong presentation and communication skills. Numerous articles and papers published. Frequent speaker at conferences on topics of operations professionalism, open source development, decision making within technology contexts, and culture in the information age.

Education

Royal Military College
Bachelor of Engineering (Engineering Physics)
Kingston, 1991-1995

Shad Valley
Science, Technology & Business
Ottawa, summer 1990

Career

Apkudo
Principal Engineer
Sydney, 2023-

Tlon Corporation
Head of Platform Engineering
- Implementing Observability for scale
Remote, 2022-2023

Daisee
Vice President, Engineering
- Design & Architecture
- Infrastructure & Security
- Platform Operations
Remote, 2020-2022

Commonwealth Bank
Engineering Manager
- Systems Engineering
- Cyber Security
Sydney, 2015-2020

Anchor Systems
Head of Engineering
Sydney, 2013-2015

Operational Dynamics
Consulting Engineer
Sydney, 2003-2013

Upoc, Inc
Director of Operations
New York, 2000-2002

ShadNet Online Community
Co-Founder & Technical Architect
Toronto, 1996-1999

Canadian Armed Forces
Infantry Officer
Canada and Europe, 1991-2000

Digital Equipment Corporation
Systems Administrator
Toronto, summer 1990

Directorships

Canadian Centre for Creative Technology
Member, Board of Directors
1996-2006

Linux Australia, Inc
Secretary, Managing Committee
2003-2005

Australian Unix, Linux, and Open Source Professionals' Organization
Member, Board of Directors
2003-2004

Results

Professional

Re-engineered a company's entire complex distributed system to be sustainable, responsive, and extendable. Carried out top-level architecture, detailed engineering design, and wrote code for multiple subsystems. In under a year increased production deployments from two per month to over 50, took developer velocity to over 300 changes per month from less than ten, and dramatically improved platform availability. Delivered a 5× reduction in Amazon cloud infrastructure spend.

Delivered a major effort to implement observability, instrumenting backend application servers, internal systems, and build pipelines. Wrote new tooling to enhance understanding behaviour of workload and underlying Kubernetes clusters. Implemented trace and span telemetry to Honeycomb for all services and tools. Matured incident management and other SRE practices. Set up on-call schedules, anomaly detection, and incident management procedures helping an inexperienced team handle crisis with greater professionalism resulting in better outcomes for customers.

Built a strong practice of engineers concentrating on functional programming, systems engineering, and data science. Revamped hiring process, recruited over 150 staff into analytics and later infrastructure departments.

Managed largest Big Data™ cluster in the southern hemisphere. Reduced complexity and running cost by refocusing engineering on reliability and systematic operational improvement.

Adapted [Site] Reliability Engineering practices to an enterprise context and improved organization's support, incident response, and release management.

Developed the justification, cost analysis, and engineering design for a significant investment in datacenter servers and networks. Financial modelling included scaling options, vendor selection, and amortization to profitability.

Assisted a number of Silicon Valley startups to establish effective distributed global development teams and to grow into successful open source companies.

Mentored and grew young staff in their first management roles to become effective technology leaders.

Completed comparative research into the regulatory burden imposed on small business by government policy in various countries, setting the stage for a more considerate approach when designing incentive programs.

Deployed a multiple layer queue-based system to drive what turned out to be 5% of North America's SMS traffic at the turn of the millennium.

Developed an aggressive approach to combat readiness that set the standard for infantry training that is still being used by the Canadian Army today.

Personal

Through postgraduate study, considerable practical work (and plenty of mistakes along the way), I've developed acumen in computer science and systems engineering. This has formed a strong foundation for my technical leadership roles and given a solid underpinning for ongoing research and development.

Open Source

technique

A new domain-specific language for procedures

2019-

github.com/technique-lang/technique

Building on over a decade of research, have designed a new new domain-specific programming language for documenting and executing "procedures" as found in mission-critical applications, business processes, IT automation, and knowledge management. Implementation includes a compiler, code formatter, and a runtime to simulate and execute these procedures. Originally written in Haskell now being ported in Rust.

publish

Publishing tools for papers, books, and presentations

2016-2022

github.com/aesiniath/publish

Simplifying the task of preparing professional print-ready PDF documents by assembling source fragments written in Markdown, SVG, and optionally LaTeX.

core-program

Libraries for writing command-line Haskell applications

2012-

github.com/aesiniath/unbeliever

Opinionated interoperatibility layer to assist developers making command-line Haskell applications (be they tools or long-running daemons), including an optimized rope type for for text handling and pretty-printing.

vaultaire

Data vault for system metrics backed onto Ceph

2014-2015

github.com/anchor/vaultaire

Designed and authored a high performance time-series database to assist in problem diagnosis, abnormality detection, metering/billing, and forecasting & capacity planning.

quill and parchment

Innovative document editor

2009-2013

github.com/istathar/quill

Explored an innovative design for a What-You-See-Is-What-You-Need document editor GUI with a simple but powerful rendering back-end, focusing on usability.

java-gnome

Language bindings for GTK+ and GNOME

2006-2011

java-gnome.sourceforge.net

Re-engineered a large open source project, modernizing by introducing a code generator and focusing bespoke documentation on presenting a quality API to developers wanting to write native GTK+ applications from Java.

SINS Is Not ShadNet

Early internet-based presence and messaging system

1996-1999

Wrote a Java applet & server messaging platform to augment a Perl based community website. Developed support model and trained sysadmins to run platform. Gained support of organization to release the code as open source under the GPL.

Selected Publications

Conference Papers

"What would you do if you lost your office" Disaster Recovery in Lower Manhattan, September 2001. Lessons small organizations can learn about business continuity.

First presented at Australian Unix, Linux and Open Source Professionals' Conference in **Sydney**, Australia, September 2003. Later published in the Proceedings of the Information Security, Audit and Controls Association (ISACA) Oceania Conference, **Melbourne**, Australia, October 2004.

"Surviving Change" Understanding complexity in the IT world and increasing operations professionalism.

Proceedings of the O'Reilly MySQL Database Users Conference, **Santa Clara**, USA, April 2005.

"Modern trends in Unix and Linux infrastructure management."

Proceedings of the Systems Administration Conference, Perth, Australia, September 2005. and presented as a featured invited speaker at Large Installation Systems Administration (LISA) Conference **San Diego**, USA, December 2005.

"Realizing a Graphical User Interface for Procedures"

First presented at CodeCon, Bungleboori Camp Ground in **Newnes** State Forest, Australia, October 2007.

"Towards a Fundamental Structure for Tasks,"

First presented at CodeCon, **Mount Wilson**, Australia, October 2011.

Magazine Articles

New solutions for distributing data.

Database Trends and Applications, March 2007

A report from the frontier of Open Source and Java.

"Barbarians at the Gate", *Enterprise Open Source Magazine*, October 2006.

Solving real world package management problems caused by newer versions of software.

"Gentoo for all the Unusual Reasons", *Linux Journal*, issue 130, February 2005.

Extreme Systems Administration.

O'Reilly *OnLamp* magazine, April 2005.

Presentations

"Tales from the Dark Side of the Moon" What it actually takes to successfully deploy and maintain Open Source software.

Presented at the Linux Bangalore conference, **Bangalore**, India, December 2004 and at Toronto Linux User's Group, **Toronto**, Canada, April 2005.

"Inside | Outside" How the ability to participate helps end the digital divide.

Keynote speech to the Free and Open Source India conference (foss.in), **Bangalore**, India, December 2005.

"Massive Changes and Upgrades to Mission Critical Systems" Effective planning and documentation to mitigate risk in managing enterprise IT systems.

A tutorial presented at venues worldwide, most recently at the Large Installation Systems Administration (LISA) conference in **San Diego**, California, USA, December 2005.

"Scaling up" Growing a vibrant community around a technology product.

Originally written as the opening keynote for db4objects, Inc's first annual users' and developers' conference, **London**, UK, July 2006. Variations on this theme have been used to in other presentations encouraging communities to actively facilitate participation by new contributors.

"Writing Really Rad GTK and GNOME Applications in C, Python, or Java" A tutorial in the basics of graphical user interface development on Linux.

Originally written for the Australian Linux Technical Conference (linux.conf.au) **Sydney**, Australia, January 2007. Presented again by popular request at **Melbourne**, Australia, January 2008.

"Usability, Usefulness, and Unit Tests" Advanced topics in desktop UI development.

Presented at the Australian Linux Technical Conference (linux.conf.au) **Hobart**, Australia, January 2009

"But what good is it, really?" Perspectives on how Open Source will affect students' and their role in its future.

Keynote speech at Mukthi 4.07, M S Ramaiah Institute of Technology, **Bangalore**, India, April 2007.

"Looking back up the river" Reflections on the relations between upstream Open Source projects and those packaging software in downstream Linux distributions.

Originally written for the Gentoo Linux UK annual conference, **London**, UK, July 2007 and since presented at numerous venues.

"Opening GTK to Java programmers: The past, present, and future of the java-gnome bindings project"

Presented at the GNOME Users and Developers European Conference (GUADEC) at **Birmingham**, United Kingdom, July 2007.

"The Web Problem, and solving it in Haskell"

Invited talk at the Functional Programming Special Interest Group, **Sydney**, Australia, September 2012.

"Shattering the Monolith"

Opening Keynote, Open Source Developers Conference (OSDC), **Sydney**, Australia, December 2012.

"Conflict-free Replicated Data Types, Consensus Algorithms, and the Cloud"

Originally written as a lecture for the Functional Programming Special Interest Group, **Sydney**, Australia, June 2013.

"If your server is a function, is your company a library?"

Presented at the Commercial Users of Functional Programming (CUFP colocated ICFP) **Gothenburg** Sweden, September 2014

"Build and deployment tools for taking Haskell applications into production"

Lecture for the Functional Programming Special Interest Group, **Sydney**, Australia, November 2014.

"Vaultaire: a data vault for system metrics, backed onto the Ceph distributed storage system"

Presented at the Australian Linux Technical Conference (linux.conf.au) **Auckland**, New Zealand, January 2015.

"Observability is not Analytics!"

Presented at the Site Reliability Engineering Conference (SREcon22 Asia/Pacific) **Sydney**, Australia, December 2022.

Awards

Recipient of the Governor General's Bronze Medal (awarded to the student having the highest scholastic achievement in their high school graduating class) and won the Drill and Exercises prize, 2nd Year at RMC (awarded to the top officer cadet in his or her class). Earned a distinction on the Officer Professional Development and Field Operations exams. Awarded membership in the Canadian Aeronautics and Space Institute and the Australian Computer Society.

Interests

Enjoy distance running, trekking, and for a time studied Aikido. Read extensively on science, business, and international relations. Now pursuing research in systems engineering looking at applying probability and simulation to better manage complex organizations. Young family but an avid connoisseur of cappuccino, martinis, and world class DJs.