Timothy Cash

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Highlights & Achievements

Designed and built a custom distributed database to test a new way of building information applications. The alpha system handled millions of interactions over 310 days of operation with 16 hours downtime.

Recognized by Senate Committees, Joint Chiefs of Staff, Director of National Intelligence, and Deputy Secretary of Defense for software and analysis contribution to countering Improvised Explosive Devices.

Extensive public speaking experience with over 1,000 presentations - many to high ranking Government officials and Fortune 500 executives.

Worked in high stress environments for six years on three continents with teams of all shapes and sizes.

Tools & Technology

Git, Node.js, Javascript, Firebase, Redis, ElasticSearch, Neo4j, Google Compute Engine, Docker, Kubernetes, InfluxDB, HTML, CSS, React, Polymer. (Previous > 4 years) C, C#, ASP.net, Java, Python, Oracle, SQL, MongoDB, DirectX, OpenGL

Education & Training

BS Applied Mathematics, *magna cum laude*
Certified Ethical Hacker

USAF Intelligence Operations (Honors)
USAF Non-Commissioned Officer

Previous projects

Oakfield
Distributed immutable field oriented graph database with native version control. Designed to allow knowledge curation and information sharing to begin immediately between large heterogeneous organizations. Oakfield was built on a proprietary data protocol, Kubernetes, Docker, Firebase, Google Pub/Sub, Google Polymer, Node with Neo4j and ElasticSearch as denormalized stores.

Cellpack
Analytic and data triage web application created to reduce turnaround times after high value target captures taking a many hour process down to a few seconds. This application included a data warehouse, natural language processing, statistical modeling, and modern web design. Cellpack has impacted thousands of international investigations into terrorist networks and was an early pioneer into the use of free open source software in the intelligence community. Cellpack was built with Apache, Python, jQuery, and Oracle 10g on Red Hat 5.1 XEN virtualization.

Cellpack Mobile
Requested by deployed customers with limited connectivity, Cellpack was modified into a peer-to-peer network where each node can upload and distribute newly collected intelligence. The mobile version was designed with network segmentation and conflict resolution in mind for users that can be disconnected for many days. Cellpack Mobile was designed and deployed in less than one week by a two person team and shortly thereafter provided actionable results.

Synapse
3D geospatial temporal visualisation software. Engineered for displaying 10s of millions of data points on user controlled time-lines. Competing solutions could only represent a fraction of the total mission data at slow frame rates. A significant advantage over competing solutions was achieved by slicing the information into a vertex buffer loaded onto a modern GPU. By switching batches on and off this effectively made each segment of the buffer a representation of time instead of geometry. This technique offered a 100x speedup at one tenth of the cost and also allowed multiple mission data to be overlapped for new insights. Synapse was built with Visual Studio, DirectX9, and C#.

RTrack
Quick turn around solution developed in under one month for transferring data from mission aircraft to visualizations and intelligence reports. Product included custom designed optical character recognition library based on neural networks due to lack of access to external libraries. RTrack was built with Java and Microsoft Access.

Others
Developed dozens of unit websites used for collaboration and training. This includes a custom built content management system in 2003 used on classified networks during the Afghanistan and Iraq wars, a Stack Overflow clone for intelligence questions and a project similar to Dropbox for data captured during high value target raids in 2008.

Work History

Oakleon	2013 - 2016	Co-Founder & Software Engineer
US Government	2006 - 2010	Team Lead - Software Prototyping Activity
US Air Force	2000 - 2006	Analyst & Developer