Jason Madden

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To work remotely with a small team of passionate professionals building software products and services that make the world a better place, in a fun, flexible, innovative company that has strong shared values and fosters a positive, supportive culture, while continuing to grow my knowledge and skills.

Experience

NextThought, Co-founder, Chief Architect and Senior Software Engineer. Norman, OK (2011-2021)

- Designed and implemented distributed core architecture for NextThought's highly customizable Learning Management System using the *Zope Component Architecture*, *gevent* framework, and *ZODB* object database exposed as an HTTP REST (OData 2) service
  - This platform was used as a LMS by over **75 client organizations**, in many domains, and also as the basis for several custom development products
  - The largest deployments saw up to **5,000 concurrent users** and **hundreds of transactions per second** distributed across many processes and several machines. Meeting this challenge required tuning and optimization throughout the stack including in low-level open source libraries like *BTrees*, *zope.interface*, and *RelStorage.*
  - Helped create the content processing pipeline for ingesting various types of content (word processor, page layout, LaTeX, etc) and producing optimized HTML and graphics, and contributed to the development of the web app that interacts with this content
- Served as NextThought's interface to the Python Open Source community, porting many packages to *Python 3* and *PyPy* and becoming co-maintainer or primary maintainer of nearly **150 public projects** related to NextThought products, and scaled the team by contributing the knowledge gained back. Projects where I am the primary maintainer include:
  - *greenlet* (stack switching library used by *gevent*) is **the 60th most popular package** downloaded from the central Python Package Index (PyPI) with over **35 million downloads per month** (PyPI hosts over 330,000 packages).
  - *gevent* (asynchronous framework) is in the top 300 packages with over **7 million downloads per month**. Contributions have included **performance gains of up to 40x**
  - *RelStorage* (SQL backend for *ZODB*) contributions have resulted in **30% reductions in memory use**, substantial performance increases, and the ability to operate without a SQL server using SQLite. All of this allowed NextThought to **support more clients using less hardware**
- Performed custom client-specific development
  - Designed and implemented the storage architecture of an iPad LMS client app for a public university
  - Implemented a *PostgreSQL* backend using literate programming for a portfolio management system designed to support interactive and batch usage and **tens of millions of positions** for a corporate governance client
- Developed NextThought's technical blog using custom Zope 3 based extensions of the *Nikola* static site generator, published on *AWS S3*
  - Also wrote much of the content. In addition to being fun, and a way to draw attention to the company, it also served as a way to share knowledge internally

RiskMetrics Group, Inc. Vice President and Senior Software Engineer. Norman, OK (2002–2011)

- Worked closely with business groups to design, and then implement, enterprise-wide service-oriented architecture ("BlueBox") using *JMS* and *SOAP* with a focus on security and scalability
  - Used large clusters of dedicated servers to service **the worlds largest banks, institutions, and hedge funds** and hundreds of other clients
  - The company's **main web applications** for accessing data and analytics ran on top of BlueBox. BlueBox also provided direct Web Service API access to clients and used the slogan "Everything. All the time. Fast." Since that's not really possible, lots of pragmatic tradeoffs were made.
  - In addition to designing and building the core services of BlueBox, **supported dozens of developers** creating additional services
- Created a distributed, asynchronous, fault-tolerant workflow system for BlueBox implemented using a domain-specific, high level language ("*Gozer*", presented at HIPS2010 and TFP2010)
  - **Hundreds of workflows** ran around the clock to meet clients' custom data transformation, analytics, and reporting needs
- Developed supporting infrastructure for developing and managing BlueBox
  - Pioneered *Python*-based unified build and deployment system for BlueBox libraries and services
  - Built *Eclipse*-based plugins to interface with BlueBox, including graphical configuration editors and object explorers
- Managed four-person team working on BlueBox and its supporting infrastructure
- Ported *C++* risk analytics engine to 64-bit Windows to allow processing the ever larger amounts of data demanded by clients
- Designed and maintained *Oracle & MS SQL Server* persistence architectures for services and web apps
  - Used *Oracle Real Application Clusters* to support the **multi-terabyte storage and reliability needs** of BlueBox services
  - When the data grew too large to quickly query from *Oracle*, created an **in-memory service to query about 60GB of metadata**, dramatically speeding performance for many client-facing operations

Continues on reverse.

Education

University of Oklahoma. Norman, OK (2000–2010)

- Graduated with M.S. in Computer Science (thesis option), December 2010
- Graduated with B.S. in Computer Science (with distinction), December 2006
- Studied Software Engineering, Graphical User Interfaces, Machine Learning, Data Mining and other advanced topics

Oklahoma School of Science and Math. Oklahoma City, OK (1998–2000)

- Attended a two-year residential magnet public school for students academically gifted in mathematics and science
- Placed first in state and second in nation as part of TEAMS+S academic competition group

Skills

Languages

- Python, Cython, C/C++/Objective-C, Java, SQL, Lisp, shell

Technologies

- ZODB, Zope Toolkit, Zope 3, gevent, XML, SQLite, buildout, IP networking, AWS, HTTP

Tools

- macOS, Linux, git, Emacs, PostgreSQL, MySQL, Graphite, Redis, stunnel, GitHub Actions, Appveyor CI

Publications

- MADDEN, J. The gozer workflow system (Master's thesis, University of Oklahoma, Norman, Oklahoma). (Fall 2010). Retrieved from https://www.ou.edu/content/dam/CoE/CS/Thesis_Dissertations/2010/Madden_Jason_MS.pdf
- MADDEN, J. Gozer: a dynamic object-oriented lisp for the JVM. In *Proceedings of the 11th Symposium on Trends in Functional Programming* (May 2010).
- MADDEN, J., GROUNDS, N. G., SACHS, J., AND ANTONIO, J.K. The gozer workflow system. In *Proceedings of the 24th International Parallel and Distributed Processing Symposium* (April 2010), IEEE.
- SHRESTHA, H. K., GROUNDS, N. G., MADDEN, J., MARTIN, M., ANTONIO, J. K., SACHS, J., ZUECH, J., AND SANCHEZ, C. Scheduling workflows on a cluster of memory managed multicore machines. In *Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA '09)* (July 2009).
- GROUNDS, N., MADDEN J. Improving the performance of batch-driven distributed systems using genetic algorithms, artificial neural networks and bayesian networks. (Unpublished graduate research). (Fall 2006) Retrieved from https://mcgovern-fagg.org/amy_html/courses/cs5033_fall2006/Madden_Grounds_ML2006.pdf

References

Ken Parker

- CEO and co-founder, NextThought
- Co-founder and former Director of Human Resources at RiskMetrics (who hired me)
- ken.parker@nextthought.com

Chris Utz

- CTO and co-founder, NextThought
- Former Senior Operations Engineer at RiskMetrics
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Carlos Sanchez

- Senior Software Engineer, Apple
- Former Senior Software Engineer at NextThought and Senior Software Engineer at RiskMetrics
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