Andrew Mark Johnstone

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Experience

HSBC: London   September 2018 – Present (contract airwalk)
Devops Engineer

Built and operated a large-scale, secure and compliant Kubernetes Platform for HSBC from the ground up. (150,000 containers, 5000+ nodes, 75+ clusters, 10k+ deployments in a single cluster and still growing).

Covering Architecture, Engineering, Site Reliability Engineering (SRE) throughout.

As a key engineer/SME influenced the entire plattform, container strategy
- Kubernetes, istio, terraform, python, custom kubernetes operators, groovy/jenkins, AWS
- Built re-usable compliant terraform modules
- Built custom solutions for failover and disaster recovery of 10s of thousands of applications.
- Solutions for housekeeping and cost optimisation
- Worked in large teams of around 100 people for the project advising and solving problems.

Photobox: London   August 2012 – September 2018
Core Engineer / System Administrator

As a core engineer, I was rotated across multiple projects and responsible for running production infrastructure, scaling, monitoring, performance optimisations, development and supporting development teams.

- Boxtop - rewrite of photobox platform
  - Configured multiple environments, and deployment pipelines for a Java stack using Magnolia CMS, and an API based on Drop Wizard.
  - Provisioning is handled via Amazon Route53, ELB, Autoscaling, Rake, RDS, hosted-chef, cloud-init, Jenkins and Packer.io for immutable deployments for continuous delivery.
  - Monitoring/alerting with Datadog using JMX, Cloud-watch, Pager duty. Elastic search/Logstash/Kibana
- Universal Checkout - integration of Adyen payment processor
  - Joined the team to configure production infrastructure and took over as lead developer.
  - NodeJS split into a front-end and services layer. Developed postcode lookup, google spreadsheets to manage data, geocoding services. Background workers using ZMQ.
  - Configured Amazon Opsworks with custom deployment using chef. Monitoring & alerting using monit, pager duty, Pingdom, Cloud-watch, Icinga.
  - Elastic search/Logstash/Kibana
- Paper-shaker/Incubator - PHP/NodeJS
  - PHP/NodeJS development, ported Laravel to PHP frontend/nodejs services layer that abstracted a legacy perl API. Wrote session handling for both Laravel and Symfony tied to NodeJS services layer abstracting underlying perl session management.
- Configuration Management
  - Upgrade to puppet3 correcting many very poorly implemented modules. Writing custom parsers functions, facts, modules and manifests.
- Alerting/notifications
  - Setup icinga with mod_gearman monitoring around 100 servers and covered 1200 checks.
  - Configured various alerts from production servers, internal infrastructure, and a range of application and system level checks.
- Monitoring
  - Implemented monitoring with graphite, which received at peak 1.8 million points per update.
  - This consisted of haproxy, 3 carbon cache servers, 2 carbon relays, 1 web / Memcached, which was run on EC2 with provisioned IOPS.
  - Implemented Icinga with PNP
  - Implemented Collectd to graphite and plugins
  - Wrote business metrics that sourced data from numerous queries from Clustrix and wrote them to graphite
  - Wrote Clustrix monitoring to graphite (https://github.com/ajohnstone/clustrix-graphite)
  - Wrote apache-log-stats (https://github.com/ajohnstone/apache-log-stats)

- Caching
  - Rewrote parts of frontend caching layer written in perl, which used in-proc, memcached, and file based caching. This involved analysing performance of the application stack and producing reports, testing performance and some primitive load testing. Removing file based cache reduced the load on the servers by over half.
    - Due to using file based caching and local Memcached servers, the templates that were generated were inconsistent on every server. The invalidation of this caching layer previously was largely error prone, and by changing the above is now more reliable.
    - Wrote a tool in PHP to compare the hashes of all servers in the frontend cluster to demonstrate the inconsistencies visually.

Everlution: London   November 2006 – August 2012
Lead Developer / System Administrator

I started at Everlution with a total of 3 staff members and has since grown to over 80 staff, I have been an integral key member of the team since I started. I currently support 80 staff members internally including a team of 25+ developers in the UK, 10 in the Ukraine, external clients and production servers. Working across all projects in terms of architecture, security, performance & optimisation, infrastructure, peer reviews, mentoring, recruitment and development.

- Devops/System administrator
  - Managed 50+ servers geographically within EC2, Rackspace, NTT Verio, 1and1 and Bytemark within a devops capacity dealing with performance & automation with Jenkins, puppet, slack and chef.
  - Implemented numerous monitoring solutions with mon, munin, Pingdom, graphite, rkhunter, tripwire, logwatches, and have written numerous custom bash, perl, ruby, python scripts.
  - Implemented continuous integration and continuous deployment with jenkins, vagrant and slack/chef-solo/puppet.
  - Implemented custom load balancing with ucarp/haproxy and have worked with elastic load balancing, amazon s3, autoscaling.
- Gorkana (Gorkana Database, Gorkana PR, Durrants, Metrica)
  - Gorkana is a journalist and media outlet database within the UK & US, which we were contracted to rewrite their online system (the core of their whole business) from scratch 3 to 4 years ago. Gorkana Database is a large and complex system. With a dedicated team we managed to release within a 6 month period and have subsequently maintained and built on this functionality, greatly increasing the power and sophistication of the system. ®Gorkana was sold in April 2009 for £25M to Durrants, which was not possible with their previous in-house team.
    - Responsible for
      - Gathering specifications and criteria.
      - Architecture and infrastructure • Performance and optimisations
      - Processes & deployment
      - Merging and migration into Durrants, Metrica and Gorkana.
      - Two teams of 5 developers each within maintenance & feature branch teams working within an agile/scrum environment.
    - Infrastructure
      - 6 web servers, 2 file servers, 2 mail servers, 4 database servers
      - Lang (php, perl, python, c++, bash), web & lb (apache, haproxy, ucarp), cache (memcached, apc, mysql - materialised views), message queues (0mq, php/mysql), search (elastic search [lucene]), storage & database (mysql, nfs, imap), email (exim), monitoring (munin, mon, bash), frameworks (Zend Framework)
      - Cluster of MySQL database servers with 160GB of data per node and growing, 50gb of user uploaded content.
        - Data import & migration
          - Initially imported data from Gorkanas inhouse .NET/SQL Server.
          - With the merger of Durrants I have been the sole person responsible for executing a large number of ETL processes both within Oracle 10g/11g and a cluster of SQL Server for processing OLAP cubes. Additionally wrote bidirectional updates between MySQL & Oracle 10g server from both PHP, Java, .NET using 0MQ as a message bus and CouchDB as a consistent storage.

- - - ■ Migration of servers to Durrants infrastructure on dual hp blade G7 datacenters with 160GB ram. Demonstrated performance issues and sped up Durrants infrastructure by 900% during testing on NetAPP and resulted in switching to local disk packs for performance. Automated installation with vagrant & slack.
    - ○ Subset of key functionality
      - ■ Email - Gorkana & their clients using the system, send around 100k emails per day, delivery of emails is a critical aspect of their business alongside timed deliveries to media outlets and journalists. We have written an extensive emailing system to ensure delivery with monitoring.
      - ■ Search - Originally written using MySQL, however have been rewritten to use 0mq and Elastic Search, this was a fundamental and critical rewrite of the core of Gorkana. Search affects every aspect of the system including generating lists of recipients to mail. The criteria to search on is fairly extensive and has a large number of complex intersections & hierarchical data to search upon. This was carried out solely by myself and a senior colleague.
      - ■ Sales - Migrated a MS Access accounting system to PHP/MySQL, which handles invoicing, renewals, product details.
- Bullbearings
  - ○ Financial trading games created for Reuters, RBS, Bullbearings, Société Générale and others. In a similar capacity to Vivo, I continue to support the couple active developers on Bullbearings, aiding them on relatively complex applications. Such as importing real time feeds from java into the applications, importing real-time data via C++ applications.

Bullbearings subsidiary of Everlution: London/Australia November 2006 – August 2012
Lead Developer

- Developed new virtual trading platforms for Shares, Spread Betting, CFDs, and FX based on real-time and delayed stock exchange feeds with order matching and execution. Architected a custom framework using MVC for all current/ future projects in PHP.
- Developed real-time and delayed data feeds via interactive-data API, distributing data to multiple websites from numerous stock exchanges, as well as writing monitoring tools for multi-threaded queues and latency. (C++)
- Charting with intraday and end of day data.
- Developed a web-services platform to our trading systems with the Zend Framework. That implemented a dynamic test bed, which introspected classes, methods, properties and extracted docblocks for a web interface to execute exposed methods. (Soap, Rest, XmlRpc, Jquery).
- Executed internal/external performance and security tests as well as ensuring resiliency in clients' sites.
- Managed 10-15 Linux servers with monitoring, deploying to distributed environments and setup/support of clients servers when remotely hosted.
- Currently migrating most of our hosting to Amazon EC2, with automated scaling, replication and redundancy.
- Lead a team of 6 developers conducting code reviews and audits.
- Setup Continuous Integration with Selenium RC, load testing with JMeter via a proxy using phpUnderControl with cruisecontrol.
- PHP 4/5, C++, VPNs, JQuery, mootools, mocha UI, Selenium RC, phpunit, phpUnderControl / CruiseControl, apache, MySQL, various Linux distros.

World Archipelago Internet: London, UK: November 2005 – November 2006
Senior Developer

- Developing varied web/client applications for The History Channel, Discovery Channel, Property Clients etc. (.NET(C#, ASP.NET), PHP4/5, XML, Web Standards, XHTML, CSS, MySQL 3/4, and many more.) Solutions include microsite generators, maintenance, portals etc…

Education
- Highams Park G.M School, England - 1994-1999
- Epping Forest College, England - 2000-2001
- Overseas Family College (California State University), Singapore 2001-2002