

# BRETT MACK

## Security Conscious Senior DevOps Consultant

@ mack.brett@gmail.com 07762 871670 London, UK @phpops  
in linkedin.com/in/brett1984 github.com/devopsbrett

## PROFILE

Starting my career as a developer, I spent my first few years developing websites, initially in ASP before then moving to PHP. I then moved into Linux sysadmin due to feeling some of the frustrations that DevOps practices and methodologies now address. It's the memories that I still have from those early years that push me to try harder, automate what can be automated, and develop tools or put in place procedures to make both developers and ops lives a little easier and enable them to work together more closely. I love that DevOps allows me to sit somewhere between these two disciplines and it's the enjoyment of both that has me continuously trying to broaden my knowledge of both, and recently I have found InfoSec allows me to do that. Throughout my career I have been fortunate enough to have some amazing mentors that have really shaped me, and it is for this reason I am a big proponent of knowledge sharing and will always try to make time for someone more junior that wants to learn.

## EXPERIENCE

### Senior DevOps Engineer

#### Flexciton

Mar 2021 – July 2021

Flexciton aims to improve the efficiency of semiconductor fabrication plants through the use of mixed integer linear programming and heuristics. My time here was spent improving the CI/CD pipeline using Gitlab CI, implementing linkerd as a service mesh for their kubernetes clusters and improving their cloud infrastructure costs with autoscaling solutions in particular for the kubernetes worker nodes that were used for the processor intensive MILP solver.

Azure Terraform MILP AI/ML Kubernetes Gitlab (CI) Linkerd Python  
Docker

### Senior DevOps Engineer

#### Sainsbury's Digital

Sep 2020 – Feb 2021

Embedded within the customer team, my main responsibility was to assist with a large cloud migration of their existing Single Customer View tooling (IBM MDM) and Oracle DB to AWS and to do so in a way that maintained their high security standards.

AWS Terraform Lambda Python Golang Linux Security Champion  
CloudInit ECS IBM InfoSphere IBM MDM Ansible Oracle

### Delivery Consultant

#### ECS Digital

Aug 2019 – Mar 2020

Providing multiple clients with assistance implementing DevOps practices and CI/CD. Working directly with HashiCorp service integration team to implement production hardened Vault/Consul cluster for a multi-national bank. Providing internal training.

AWS Training Juniors Technical Documentation GCP Vault Consul  
Golang Terraform Docker Python Ansible CloudInit Jenkins

## CERTIFICATIONS



**AWS Certified Solutions Architect**  
Associate - June 2017



**AWS Certified SysOps Admin**  
Associate - June 2017



**AWS Certified Developer**  
Associate - June 2017



**AWS Certified DevOps Engineer**  
Professional - June 2017



**Offensive Security Certified**  
Professional - Jan 2019



**GCP Cloud Engineer**  
Associate - Nov 2019



**GCP Cloud Security Engineer**  
Professional - Dec 2019

## CORE STRENGTHS

Hashicorp Suite Golang DevOps

Linux Continuous Delivery AWS

Problem Solving InfoSec Mentoring

Networking Knowledge Sharing

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## DevOps Consultant

### Digital Catapult

📅 Feb 2019 – Aug 2019

Researching and implementing a virtualization solution for their NVidia DGX machine learning servers. Developed an API and dashboard to manage and monitor VM guests in Golang/VueJS. Designed and implemented architecture for a smart cities IoT data sharing platform.

[AWS](#) [Kubernetes](#) [EKS](#) [Libvirt](#) [KVM](#) [Golang](#) [VueJS](#) [Terraform](#)  
[Ansible](#) [Packer](#) [CloudInit](#) [QEMU](#) [Wercker](#) [Docker](#)

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## Principal Consultant

### Airwalk Consulting (HSBC)

📅 Oct 2018 – Feb 2019

Setting up self-serve tooling to allow development teams to be self sufficient. A modular platform allowed development teams to quickly set up new projects with infrastructure set up on AWS with terraform and pipelines managed by Jenkins

[AWS](#) [Terraform](#) [Python](#) [Lambda](#) [Golang](#) [InfoSec](#) [Docker](#) [Jenkins](#)  
[Ansible](#) [Packer](#) [NodeJS](#) [PKI](#)

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## DevOps Consultant

### Digital Catapult

📅 Mar 2018 – Oct 2018

Digital Catapult bridge the gap between academia and the private sector, helping innovative companies in the UK implement some of the findings from recent research papers or conducting research on their behalf.

### Contract 1 - 8 weeks

Brought in for the final 8 weeks of a 12 month engagement/collaboration between Digital Catapult and a start-up named Cognitiv+. Cognitiv+ were initially not sold on the idea of "DevOps", insisting that their developers were more than capable of "... using AWS to create servers". While 8 weeks was a very short time to implement DevOps practices I'm pleased to say that following this they are now looking for a full time DevOps engineer to join the team.

- Base AMI images were created with Packer and provisioned on AWS using Terraform with final configuration done at boot time using Ansible/CloudInit/Consul and with environment separation using AWS Organizations.
- Created a HashiCorp Nomad cluster to provide container orchestration and developed a custom Golang wrapper to act as a deployment tool leveraging SQS to receive deployment messages from the CI platform.
- Moved docker registry from ECR to Quay.io, primarily to give developers visibility of security concerns within the docker images they were creating.
- Setup CircleCI to provide both continuous integration and continuous delivery and using Snyk to scan for vulnerabilities.
- Performed an initial security audit and, after showing how an attacker could abuse the issues found, worked with developers to fix them.

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## COURSES

### Hands on Hacking

Hacker House

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### Advanced Threat Actor Simulation (Red Team Training)

Nettitude

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### Penetration Testing with Kali Linux

Offensive Security

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### Cracking the Perimeter

Offensive Security

## COMMUNITY CONTRIBUTIONS

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## PRESENTATIONS

### Creating a Terraform Provider

London Hashicorp Meetup

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### Securing Microservice Comms with PKI

dotSecurity Paris

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### Automating PKI With Vault

London Hashicorp Meetup

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### Intro to Userland Rootkits

Linuxing in London Meetup

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## WORKSHOPS

### Finding That Darned Flag

BSides London

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## OSS PROJECTS

### Saltstack Consul Pillar Integration

🔗 <https://github.com/saltstack/salt>

*Written in python, this plugin was created to leverage Consul's Key/Value store to remove config duplication and create a single source of truth*

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### Terraform vCloud Director Plugin

🔗 <https://github.com/hashicorp/terraform>

*This project was both my introduction to VMWare vCloud Director, and Terraform. An engagement with a government department required being able to use multiple cloud providers, vcd was the only one without an existing terraform provider. This project was developed to fix that*

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# EXPERIENCE

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## Contract 2 - 4 months

Working with the Digital Catapult Future Networks team, this project involved using open source software and standard infrastructure to create a 5G network. Initially using on demand cloud servers to put together a proof of concept before moving onto in house dedicated infrastructure and switches. This project had a steep learning curve as while I have a lot of experience of using containers to provide virtualised compute it was my introduction to using containers to provide network functions virtualisation.

- The software stack for this project included: Ansible, Libvirt, QEmu, Kubernetes, Docker, OpenVSwitch, OpenCORD/M-CORD and Openstack.
- As we were trying to implement M-CORD while it was, essentially, still being developed/created the documentation was minimal, with most of it coming from just having to read through the codebase.
- While most networking devices were virtualised the base station that emitted the radio frequencies had to be physical, trying to integrate this proved to be difficult and the solution as it stands currently has been to use a VPN and IPTables as most of the traffic that needed to be routed was SCTP which left us with far less possibilities than a standard TCP/UDP stack.

[AWS](#) [Report Creation](#) [Nomad](#) [Consul](#) [Golang](#) [Python](#) [Terraform](#) [SQS](#) [Docker](#) [Packer](#) [Ansible](#) [CloudInit](#) [CircleCI](#) [NodeJS](#) [Snyk](#)  
[5G Networks](#) [Opencord](#) [Openstack](#) [NFV](#) [NRF](#) [SDN](#)

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## Senior DevOps Consultant

### Contino

📅 June 2017 – Feb 2018

Contino are a DevOps consultancy specialising in digital transformation for enterprise clients. The types of engagement I have been involved in here fall roughly into 3 categories.

- Perform company assessments. As part of a two person team we would analyze a company's current DevOps practices or their current abilities to implement DevOps practices and provide guidance as to how best to achieve their desired state.
- Design cloud migrations. Working directly with large enterprise clients, gathering requirements before designing, and then proposing, a cloud architecture that would meet their needs, implement a level of security that would get sign off from security teams and all while minimizing potential costs.
- Implement cloud migrations. This could really vary but almost constant between engagements would be infrastructure provisioning with Terraform, configuration management with ansible, and the general roadblocks that come with working with enterprises, requiring quick thinking or *creative* networking to minimize impact to the project while the blocker was cleared.

[AWS](#) [Report Creation](#) [Vault](#) [Terraform](#) [Jenkins](#) [Groovy](#) [Golang](#) [Consul](#) [Active Directory](#) [Ansible](#) [Docker](#) [Kubernetes](#) [CI / CD](#)

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## DevOps Consultant

### OpenCredo

📅 Aug 2015 – June 2017

Software consultancy turned technical consultancy. OpenCredo attracted clients with interesting and highly technical challenges. There were two engagements that really stood out though.

- Creating a cloud broker for a government department. Needing to avoid showing a bias towards large global cloud providers over smaller, local providers we were tasked with creating a *hybrid*—cloud broker, allowing developers to automate the provisioning of a full, development environment with CI pipelines, monitoring, perimeter security on one of many different cloud providers or even split resources between multiple providers. Completely written in Golang and leveraging most of the HashiCorp suite of tools as well as ansible this project forced me to improve my Golang abilities very rapidly, creating multiple Terraform providers as well as custom integration between components.
- Creating an encrypted Docker volume plugin for a client that needed to generate SSL/TLS certificates and store them somewhere to be picked up and used by a later process. This was my last engagement with OpenCredo and I'm thankful I was able to lead a team for this project. Initially, I thought the combination of specifications for this project to be impossible, but with lots of research and a great team we once again used Golang and an implementation of FuSE to provide a single docker volume which was able to dynamically create key material and encrypt data on the fly with per-directory granularity.

Golang AWS Vault Vagrant Terraform Jenkins Ruby Golang Kubernetes Openshift Ansible Puppet Bless PKI

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## Lead DevOps Engineer

### Flubit

📅 May 2014 – Aug 2015

Flubit is a start up that's disrupting the E-Commerce industry. Flubit allows shoppers to demand a better price on items they want to buy. Some of my responsibilities while in the role included:

- Set up and manage monitoring services (OMD/Check\_MK/Custom Check\_MK scripts, log data collected from servers, transformed/transported with fluentd, stored in InfluxDB, then graphed with Grafana)
- Set up service discovery with DNS and individual service checking (so failing services can be removed from the DNS), leaving DNS requests only directing to healthy services (consul)
- Provision new VMs and manage configuration/packages in existing VMs (SaltStack, Consul K/V store as Salt Pillar source)
- Setup and maintain the continuous integration server (Jenkins with multiple slaves, using the workflow plugin to create dynamic build pipelines on the fly with Groovy. Speed up build times by splitting tasks and running them concurrently in their own Jenkins build slot. Almost half of the projects now have docker containers and docker-compose config allowing them to spin up their own pristine test environment for the duration of the Jenkins build)
- Run a private docker registry (Using Rackspace Cloud Files as storage), create a docker image during project build and upload it to the registry (Dockerfile, docker registry)
- Develop deployment scripts for safe, repeatable deployments to each of our environments (docker-machine/docker-swarm to remotely deploy docker images, capistrano3/rake for our other projects)
- Write custom scripts/apps whenever needed (Ruby, Python, Go, Bash)

Docker Jenkins SaltStack Vagrant Groovy Consul Service Discovery Ruby Fluentd InfluxDB Python Graphana Golang Mesos Elasticsearch

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## DevOps Engineer

### Foodity

📅 Oct 2013 – May 2014

Foodity is a start up that makes any print, digital or broadcast content or advertising shoppable online and in store. They help their partners incentivise and reward shoppers and help them make their shoppers' journeys simple and relevant. My responsibilities included:

- Redesigning the systems architecture and expressing the new architecture with puppet scripts
  - Migrating from AWS to Azure
  - Providing support for the existing architecture
  - Writing ruby scripts to automate manual processes where ever possible
  - Setting up a clustered database solution with replication (Percona XtraDB Cluster 5.6, Galera 3)
  - Supporting both the Java and PHP development teams
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## TechOps Consultant

### OgilvyOne Worldwide

📅 Jul 2013 – Sep 2013

Ogilvy is one of the top advertising agencies in the world, handling advertising campaigns for the likes of Coca-Cola, Unilever, British Airways and Barclays Capital among many others. This was a contract role and I was initially brought on to perform an audit on 2 dedicated Windows servers used for development and staging that had been poorly managed to assess what was on there, what was being used, and develop a strategy for setting up and provisioning servers on the Amazon cloud and migrating data across. This then led on to further projects including setting up auto provisioning, auto scaling cloud servers for the BA 'To Fly To Serve' campaign (<http://toflytoserve.britishairways.com/>), and setting up a custom continuous delivery solution, easily managed with a json dataset stored on github.

- Continuous Integration with Jenkins (Set up to provide continuous delivery and automated to the point of not needing to be administered by anyone)
- Auditing Windows servers (Ruby, Scraping file system/config files)

- Automated deployment (Ruby/Capistrano)
  - Setting up and provisioning cloud servers (AWS, Cloudformation, Puppet)
  - Migrating data between servers
  - Analysing developers workflow and code in order to provide solutions to speed up creation and deployment of new projects
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Full details of historic positions have been omitted to preserve paper but are available upon request.

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## Build Engineer

**[Ticketmaster](#)**

📅 Dec 2012 – Jun 2013

## DevOps Engineer

**[Bauer Media](#)**

📅 Jan 2012 – Oct 2012

## DevOps Engineer

**[theAudience](#)**

📅 May 2011 – Dec 2011

## PHP Developer / Server Admin

**[Lightfarm](#)**

📅 Oct 2010 – May 2011

## PHP Developer

**[3dMarComms](#)**

📅 Nov 2009 – Sep 2010

## PHP Developer

**[Ardent Creative](#)**

📅 Jan 2006 – Nov 2006

## PHP Intranet Developer

**[Cruise Control](#)**

📅 Oct 2004 – Oct 2005

## ASP Developer

**[Lizard Design](#)**

📅 Jun 2001 – Oct 2004