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I'm a software engineer with experience architecting scalable distributed systems and fault tolerant payments systems. I've got a background in networking and Linux administration.

Senior Backend Engineer   **May 2017 - Present**
Monzo Bank, London UK

I joined the payments peam prior to the launch of Monzo's current account product. I designed, built and maintained distributed payment processing systems (Mastercard, Faster Payments, CHAPS, Bacs, cash deposits) that are now used by over 4.5 million customers.

- **I led the design and implementation of a new payments processor to handle cash deposits** via integration with PayPoint, a company offering over-the-counter deposits in shops. Adding cash deposits was an important strategic feature to encourage customers to use Monzo as their primary bank account. The cash deposit system now handles over £500k worth of deposits a day, and has the least operational overhead of all of the bank's payment systems, measured by the number of issues requiring manual investigation.
- **I was the technology lead for a project to introduce support for SEPA Credit Transfers** (Cross-border Euro payments). Including SWIFT integration, a new payment processor for the ISO20022 standard format, integrations with new sanction screening and currency conversion tools, and reconciliation systems to prove correctness of all money movements performed by these systems.
- **I worked on the design and implementation of a Faster Payments gateway**, the system responsible for maintaining connections with and routing payment messages to the UK Faster Payments network. This was a technically complex architecture project that required a live cut-over migration from a hosted 3rd party product, bridging physical and cloud infrastructure. This required extensive load testing and passing a full functional test suite from the payment scheme operator.
- **I designed and built a system for ordering batches of physical mastercard debit cards**, from multiple suppliers. Among the system's responsibilities are assigning new unique card numbers to each card, encoding chip and magstripe data, and abstracting the embossing capabilities and label printing rules of each supplier.
- **I was an incident manager for critical incidents** - a member of a small rota of people to whom incidents were escalated if they required coordination and decision making beyond the expectations of first-line on-call engineers. E.g. facilitating communications between the executive team, customer support teams, press and regulatory communications teams. I published a technical overview of one incident I managed on Monzo's blog.

Technologies and expertise

- Go & Python
- Cassandra
- API and inter-service RPC design
- Event driven architecture (via Kafka, NSQ)
- Payments messaging standards e.g. ISO8583, ISO20022
- Kubernetes & Docker
- Amazon Web Services (AWS)
- Monitoring and alerting for payment processing systems (via Prometheus / Alertmanager)

Infrastructure Lead   **May 2014 - May 2017**
Osper, London UK

Osper provides a pre-paid debit card product to children from 8-18 in the UK, overseen and managed by a parent. Due to the small size of the company I had the opportunity to wear multiple hats - from Software Engineer to Sysadmin - but my role was primarily focused on infrastructure.

- **I introduced a culture of DevOps, and built tooling and systems to allow CI and frequent deployments.** I built and optimised a containerised deployment system on top of Amazon ECS that sped up deployment time for our engineers from ~10m to under 1 minute.
- **I introduced a policy of "Infrastructure as Code"**, ensuring all resources in AWS were managed via Cloudformation or Terraform, so they could be easily re-created.
- **I introduced centralised logging**, originally with the ELK stack but eventually replacing this with AWS CloudWatch Logs for a large cost saving.
- **I built real-time push notifications for customers spending money** on their Osper cards.

Systems Administrator   **May 2011 - May 2014**
Mendeley, London UK

- **I automated provisioning of new hardware via PXE network booting**, and AWS cloud resources via Vagrant and Puppet and cloud-init.
- **I designed highly available physical networks for production datacentre and office use**, including resilient always-on VPN connections to AWS VPCs
- **I automated software deployments** using Debian packages and puppet

Systems Administrator   **Jun 2008 - Mar 2011**
Serendipity Interactive, Glasgow UK

I was hired as a customer support agent, but began automating processes and quickly transitioned to being a full time Linux system admin.

The company sold a managed email spam filtering service to large organisations. I created a new version of the product built on top of open source solutions including spamassassin and postfix. This eliminated the cost of the licenses the business was paying for the previous version of the product, and resulted in a better performance for customers as measured by the number of false positive and false negative matches produced by the spam filter.