

Rob Shakir

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PERSONAL STATEMENT I am an engineer and technical leader who spans the software engineering and network architecture tribes - with deep exposure to the variety of challenges that enabling consumer and business communications entails. I have 20 years of experience building various communication systems in startup, cloud, application provider and telco environments. In my most recent role I have focused on transforming the network control and management plane - spearheading the development of OpenConfig, and modernising network control and management-plane protocols. I am driven by addressing ambitious problems, making them tractable, and shipping solutions into production environments. I am a hands-on engineer - contributing through directly writing code and building network infrastructure - alongside being an established technical leader experienced in defining roadmaps, leading teams, and mentoring engineers. My colleagues recognise me as an approachable, flexible engineer, who has a bias to action.

CAREER HISTORY **Senior Staff SWE**, Google, Inc. (AS15169) *San Francisco, CA, USA. August 2016 - Present*

- Software and network engineering role, primarily within Google's Global Networking team. Acted as a senior technical individual contributor driving the architecture and implementation of both network and software infrastructure supporting Google's global footprint.
- Increased flexibility and introduced supplier optionality for network devices in Google's WAN and datacentre networks by inventing and leading implementation of modern gRPC-based device APIs for device control and management (gNMI, gNOI, gRIBI), structured device data models (OpenConfig) and accelerating their qualification through open source, programmatic testing (ONDATA, featureprofiles). Acted as the internal and industry-facing lead for these projects - driving their adoption and usage in open source (SONIC, FAUCET), commercial implementations (including Cisco, Juniper, Nokia, Arista, Ciena), and by other network operators.
- Led a group of ≈50 software and network engineers to own network device specification, qualification and introduction into Google's networks, and provide the software layer abstracting them to the network management stack (including configuration generation, telemetry collection, and device interaction) - allowing improved cycle time, reduction of production defects, and pay-down of accumulated technical debt. Notably, introduced multi-vendor COTS devices into Google's B4 WAN.
- Led and contributed to many technology evolutions within Google's networks - including driving industry direction and implementation of Segment Routing; driving the definition and implementation of "hybrid SDN" architectures; and re-thinking centralised and distributed control-plane architectures. These programmes directly define the technical direction for a team of >200 software and network engineers working on WAN infrastructure supporting internal Google services and Cloud customers. Influenced leaders across networking in Google, alongside hands-on work directly with network and software engineers to implement and demonstrate these concepts.
- Acted as a senior technical leader across Google networking, including acting a lead for the Network Engineering career ladder within Google at a time of major change in the discipline. Formally and informally mentored numerous network and software engineers, and drove collaborated with engineering management to develop strategies for recruitment, improve team effectiveness, and drive individual's career development.

Senior IP Architect, Jive Communications (AS6643) *Orem, UT, USA. October 2015 - August 2016*

- Technical leadership role focused on defining the architecture, implementation and operational practices associated with Jive's infrastructure - which provided a platform for real-time communications services across North/Latin America, and Europe. Jive was acquired by LogMeIn in late 2017.
- Acted as lead architect for programmes to evolve flexibility of Jive's infrastructure. Architected, designed and implemented MPLS-based connectivity between network infrastructure, virtual machines, and Kubernetes containers - allowing direct customer interconnection into private topologies, extension of Jive's private IP network connectivity into new markets, and improved network security.
- Drove new approaches to automation of network operation through use of model-driven interactions with network infrastructure and management platforms - exploiting open source models (OpenConfig), and YANG-based service models to allow automated provisioning, validation, and testing of network services, resulting in improved quality of experience for Jive's customers.
- Led a programme with the development and executive teams to improve service stability, infrastructure security, and disaster recovery approaches - aligning Jive with industry best practices, and supporting commercial aims.

End-to-End Network Architect, BT (AS2856/AS5400/AS3300) *London, UK. December 2011 - July 2015*

- Technology leadership role within BT's Chief Network Architect's office - with primary responsibility for the architecture, technology strategy and investment planning for networks supporting Openreach, Retail, Wholesale and Global Services product capabilities.
- Initiated and led a programme to significantly improve the flexibility and efficiency of BT's UK network infrastructure - exploiting lower cost technologies, introducing new approaches to subscriber termination and radically transforming the 21CN IP/MPLS core network infrastructure. Developed and agreed strategies with CxO-level personnel - driving programmes delivering >50% unit cost reduction for Broadband services, and realising >£150M capital expenditure savings, whilst improving commercial flexibility, network availability and performance.

- Led architecture and peering strategy for BT's global Internet networks - reducing the unit cost of delivery >60%, and improving service quality for content delivery, and enterprise connectivity to XaaS/Cloud services.
- Acted as end-to-end architectural lead for IP and packet core capabilities in BT Mobile (covering WiFi, LTE and roaming to 3rd party RAN), developing approaches to integrate EPC and IMS capabilities into 21CN to underpin consumer and business (including VoLTE) propositions, and replace legacy PSTN services.
- Developed and agreed strategic architectures for the delivery of linear TV and video-on-demand across the BT networks - supporting BT Vision, BT Sport, over-the-top media and broadcast services. Led an architectural programme to implement a converged CDN platform to optimise delivery costs, and improve QoE.
- Drove development programmes inside BT to introduce new technology - improving service flexibility by converging global L2/L3VPN edge routers; simplifying the Broadband architecture through implementation of policy and traffic management on BRAS devices; expanding UK footprint through a low-cost seamless MPLS architecture; ensuring service continuity through introducing IPv6; and reducing cost and complexity through multi-layer optimisation.

Network Designer, Cable&Wireless Worldwide (AS1273/AS4445) *London, UK. June 2010 - December 2011*

- Design/Architecture role - primarily focused on the C&W Multi-Service Platform (MSP) - translating 5+ year technology strategies into robust scalable network architectures. Within a team acting as the TDA for C&W's IP/MPLS deployments, personally acted as TDA for core technologies, network robustness and scalability and contributed to the technical strategy for C&W's Internet networks.
- Technical lead for the MSP P/PE infrastructure, including key projects significantly reducing network outages, and increasing service availability by implementing best-practice deployments and more robust protocol functionality. Developed scaling models, test strategies and protocol/tooling requirements to support network growth whilst optimising the deployment and operational costs.

Network Development Engineer, Vialtus Solutions (AS5413) *London, UK. June 2008 - June 2010*

- Contributed to the network development team of an EU-wide NSP - with primary responsibility for the architecture and design of an 60+ node MPLS-TE network. Supported the company's change of focus towards business services by leading projects to consolidate network infrastructure - including service migrations away from, and closure of a legacy ATM network; integration of numerous acquisitions; redesigning business Internet and L3VPN connectivity products; and implementing strategic OSS tools for network infrastructure.

Technical Architect, Catalyst2 Services (AS29636) *London, UK. 2003 - 2008*

- Led technical operations for a startup hosting provider's infrastructure - including architecting, designing, implementing and operating public Internet and metro networks, and Linux-based hosting platforms.
- Designed, implemented and launched an early Linux VM hosting service based on User-Mode Linux - including maintaining CPU time capping kernel patches for 2.4.x and porting this functionality to 2.5 and 2.6 Linux kernels.
- Supported commercial elements of the company, including providing pre-sales consultancy, to ensure the continued growth and success of the company.

Systems Administrator, UH Hosting *London, UK. 2001 - 2003*

- Developed and managed server infrastructure delivering HTTP/e-mail and communication services.

EDUCATION **Physics**, Imperial College London *2005 - 2008*
 BSc (Hons) - 2:1 Classification. Tessella Prize for Software for Final Year Project.

A-Level, Greenhead College, Huddersfield *2003 - 2005*
 5 A-Levels (3A, 2B) and 1 AS-Level (A).

GCSE, The Crossley Heath School, Halifax *1998 - 2003*
 11 GCSEs (7A* and 4A). Halifax plc Award for Academic Achievement (Autumn, 1999)

ACADEMIC **Co-Instructor**, University of California, Berkeley *2022, 2024*
 EXPERIENCE & GUEST LECTURER Guest lecturer (2022) and co-instructor with Prof. Sylvia Ratnasamay (2024) for *Introduction to the Internet: Architecture and Protocols*, CS168.

Guest Lecturer, École Polytechnique, Paris, France *2014-2019*
 Guest lecturer for INF566, and the "Future Internet" course at Telecom ParisTech - lecturer on protocol development, and implementation challenges for network operators to post-graduate students.

Standards & Publications

- Published [13 RFCs](#).
- Co-chair of the IETF SPRING (Segment Routing) working group from 2017-2019.
- Co-author of [4 patents](#), with a number of pending applications.
- [Open sources](#) contributions, particularly related to [OpenConfig](#).