Kiran Makhijani

Curriculum Vitae

(+1) 408-410-2484
kiran@mirani.net
Github Linkedin

Introduction

Goal: Seeking an architect or a principal leadership role in the area of network architecture, protocol and platform research, development, standardization.

Proven Record: I have been in the data- and tele-communication industry throughout my career and have a track record of accomplishing beyond the project goals. Known for successful collaborations with internal and external partners, very active in standards (IETF, ITU, ETSI) and research community (IEEE, ACM).
As a technologist, I have a number of patents, my work is published in both academic and industry standard organizations.

Strategy & Planning: Reporting into the OCTO, I have been part of several pre-production initiatives; collaborated with executives and managers to develop long-range BU vision, strategic initiatives, defining targets, requirements, and actionable recommendations.

Leadership and Mentoring: Outside work, I am a mentor to graduate students. I volunteer at a level-up program, with a university preparing students for professional life.

Professional Experience

Futurewei Technologies, Santa Clara, CA

Nov, 2013 – present — ***Principal Engineer***.
Working with the office of the CTO, involved in the industry research on next-generation network technologies and protocols in service provider and large-scale network markets. Day to day work involves equal parts research, standardization and collaboration. It entails presenting, meeting partners and customers explaining new research directions, design and solution with technical details.

Cloudcasting — ***Virtual routing architecture for cloud centric applications***.
Developed a virtual routing architecture and protocol for auto-provisioning of tenant networks.

Network 2030 — ***Innovations in IP Networks***.
Focus on in-network services and capabilities for emerging applications in industry automation, and advanced media ('holographic type' and high-precision communications). Analyse challenges in current networks and research new data plane and packet format mechanisms. Designing proof-of-concepts for research in transport and network layer.

Network Slicing — ***Operator-centric Architecture for Network Slices***.
An end to end 5G/B5G Network Slicing architecture and protocol for resource sharing in a multi-domain, multi-tenant network. Led IETF standard in scope of Network slice framework and terminologies.

5G Transport — ***3GPP Mobile Backhaul Transport Networks***.
An in-depth study and evaluation of end-to-end LTE, 5G/B5G Network Slicing architecture with specific focus on mobility and protocol overheads in mobile networks.

Standards activities: — ***Founding member of FG-NET-2030.***.
Network 2030 initiative at ITU, to develop formal road map and requirements for the next-gen network technologies. Familiar with IETF mechanisms and leading standardization of network slices in IETF.

Leadership: — ***Program and Project Management.***.
Both in the US and Europe on future network architecture topics, guiding students on New IP research.

Cisco Systems, San Jose, CA

July,2005 – Oct,2013 ***Technical Leader***.
Led design & development of Edge routing and switching component on IOS-XR, IOS. Including first in-house support of an Openflow agent, policy based routing, Lawful intercept, etc. Solved high-availability and scalability challenges on a distributed system such as IOS-XR.
At Cisco, I have mentored new hires, resolved customer issues and worked with platform-hardware and core operating system teams.

Policy services layer : Developed architecture to support flow-based infrastructure as well as network programmability (ONEP) for a distributed system. **Platform Stability**: Provided HA solution for lawful intercept as a part of L2L3 services team. Developed hybrid architecture endian aware message translation methods.

Edge Router Services: Developed platform-dependent slow-path forwarding module, added performance tweaks for QoS, selectively drop packets, prioritizing control packets, and bug fixes.

L2 functions: Designed support for CFM 802.1ag standard over EoMPLS and different Metro Ethernet services. The services included CFM over VFI interfaces.

Pre-2005 ***Software Engineer***.
Contributed to network device drivers and RTOS projects at HCL Tech, Futuresoft, Alcatel, Tasman Networks.

Education

1994–1997 : **Master of Computer Applications**, *Computer Science Department* , Pune University).

1991–1994 : **Bachelor of Science**, *Delhi University*, Delhi, India.

Technical skills

Programming Languages ***Experienced:*** C, C++, ***Familiar:*** Python, Bash, Java

Network Technologies Network Architecture, Protocols, 5G Arch, 5G-Backhaul, Edge computing, Network Slices, Service Provider and Data Center Networks

Network Protocols ***Developed:*** STP, CFM, BFD, QoS, PBR, lawful-intercept, ***Fluency:*** BGP, IS-IS, Segment Routing, and MPLS.

Standards and Research Authored specifications for IETF, ITU-T, and ETSI. TPC, *author, chair, reviewer* in ACM, IEEE involvement

Network Infrastructure IOS, IOS-XR, ASR9k, 7600 series

External Positions of Responsibility

2020-21 **General Chair** of the 1^{st} Workshop on IEEE New Internetworking Protocols, Architecture and Algorithms (NIPAA), IEEE ICNP.

2018 **Session Chair** of the 1^{st} New Internet Forum, ETSI Track, at SDN NFV Congress

2018, 19 **General Chair** of the 1^{st} Workshop on Networking for Emerging Applications and Technologies (NEAT) at ACM SIGCOMM.

2017 **Rapporteur** for E2E Network Slicing Architecture, Next-generation Protocols group at **ETSI-NGP**

2019, 21 **Technical Advisor** to annual CXO Advisory Board at **ITU-TSB**

Publications

Published Papers (Accepted)

2020 Richard Li, **Makhijani, Kiran**, and Lijun Dong. New ip: A data packet framework to evolve the internet : Invited paper. 2020.

2020 Abdulazaz Albalawi, Hamed Yousefi, Cedric Westphal, **Makhijani, Kiran**, and J.J. Garcia-Luna-Aceves. Enhancing end-to-end transport with packet trimming. 2020.

2019 Ali Mohammadkhan, K. K. Ramakrishnan, Uma Chunduri, and **Makhijani, Kiran**. Improving performance and scalability of next generation cellular networks. *IEEE Internet Computing*, 2019.

2019 Kiran Makhijani, Hamed Yousefi, K. K. Ramakrishnan, and Richard Li. Extended abstract: Coordinated communications for next-generation networks. 2019.

2019 Richard Li, **Makhijani, Kiran**, Hamed Yousefi, Cedric Westphal, Lijun Dong, Tim Wauters, and Filip De Turck. A framework for qualitative communications using big packet protocol. ACM, SIGCOMM, 2019.

2018 Cedric Westphal, **Makhijani, Kiran**, and Richard Li. Packet trimming to reduce buffer sizes and improve round-trip times. 2018.

2018 Richard Li, Alexander Clemm, Uma Chunduri, Lijun Dong, and **Makhijani, Kiran**. A new framework and protocol for future networking applications. ACM, SIGCOMM, 2018.

2018 A; **Makhijani, K** Galis. Network slicing landscape: A holistic architectural approach, orchestration and management with applicability in mobile and fixed networks and clouds. [lecture]. 2018.

2016 Salvatore Talarico, **Makhijani, Kiran**, and Padma Pillay-Esnault. Efficient Service Auto-discovery for Next Generation Network Slicing Architecture. 2016.

2016 Kiran Makhijani. Cloudcasting—Perspectives on Virtual Routing for Cloud Centric Network Architectures. [Keynote]. 2016.

Standards and Industry Relevant Publications

2020 [Co-Author] with Taleb, T. et al. White paper on 6G Networking. 2020. `https://www.6gchannel.com/items/6g-white-paper-networking/`.

2017 Ed. [White Paper. Next Generation Protocols – Market Drivers and Key Scenarios [White Paper]. 2017. `https:/awww.etsi.org/images/files/ETSIWhitePapers/etsi_wp17_Next_Generation_Protocols_v01.pdf`.

2017 Ed. [White Paper. Network 2030 – A Blueprint of Technology, Applications and Market Drivers Towards the Year 2030 and Beyond. 2017. `https://www.itu.int/en/ITU-T/focusgroups/net2030/Documents/White_Paper.pdf`.

2017 Co-author [Specification. GS NGP 001 Next Generation Protocol (NGP); Scenario Definitions. 2017. `http://www.etsi.org/deliver/etsi_gs/NGP/001_099/001/01.02.01_60/gs_NGP001v010201p.pdf`.

Publications and Speeches as Subject Matter Expert

2019 [Session Speaker]. Holographic Type Communication: Delivering The Promise of Future Media in 2030. AWE Full Stack Computing Workshop., 2019. `https://www.awexr.com/usa-2019/spatial-computing-workshop`.

2019 [Session Speaker]. Future of slicing and ML - Cognitive high-precision slicing. Guidance to future roadmap as part of technical matters of growing strategic relevance to ITU standardization at SGLA. 2019. `https://www.itu.int/en/ITU-T/studygroups/2017-2020/Pages/sgla.aspx`.

2019 [Session Speaker]. Holographic Type Communication Delivering the Promise of Future Media by 2030. A talk that details out network challenges and possible approaches to delivering holographic type media. ITU-T, Fifth Workshop on Network 2030, Geneva, 2019. `https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2019101416/Documents/Kiran_Makhijani_v2.pdf`.

2019 [Panelist]. Maturing E2E Network and Cloud Slicing: Where are the frontiers ?, IEEE WCNC'19. Dealing with diversity of standards, Resolve multi-domain, multi-operator aspects. 2019. https://wcnc2019.ieee-wcnc.org/panels#panel5.

2018 [Tutorial]. Future Networks: Challenges, Opportunities and Technologies. Invited Speaker at ITU-T Study Group 13, Geneva. 2018. https://www.itu.int/md/T17-SG13-180418-TD-GEN-0223.

2018 NGP Expert] [Session Speaker. Next-Generation Protocol Updates: Status, Progress and Prospectus. 2018. https://www.uppersideconferences.com/mpls-sdn-nfv/2018/mplswc2018_agenda_day_00_Tutorials_1.html.

2018 [Keynote]. Deterministic Service Delivery through IP2020 - Next Generation Internet Architecture. 2018. https://www.iaria.org/conferences2017/ProgramSENSORCOMM17.html.

2016 [Keynote]. Cloudcasting Perspectives on Virtual Routing for Cloud Centric Network Architectures. IEEE Hot Interconnects, Santa Clara. 2016. http://www.hoti.org/hoti24/keynotes/.

References

Available on Request