Fahad Naeem **Khan**

Software Engineer · SDN

San Jose, CA

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Summary

To serve as a software engineer in an organization working on latest and cutting edge technologies like Artificial Intelligence (AI), Software Defined Networking (SDN), OpenFlow, Network Virtualization (NV), Network Function Virtualization (NFV), OpenStack and Big Data Analytics. Highly motivated toward research and development (R&D).

As an Erlang/OTP enthusiast, passionate about solving software challenges like scalability, high availability (HA), fault-tolerant and distributed computing.

Work Experience

Equinix

Sunnyvale, CA

Software Engineer — *July. 2017 - PRESENT*

- Implemented driver for Ciena WaveServer and OpenLineSystem (OLS) controller MCP in ONOS. All the code is committed back to ONOS open-source community.
- Extended many components in ONOS e.g. CLI, Optical Intent Compiler, OAuth2 authentication for REST protocol etc.
- Developed alarm-handler ONOS app. The app takes well defined actions base on the alarm e.g. installation/removal of intents if port is down. (This app is not part of ONOS repo)
- Designed and developed test automation framework that helps Equinix certify different products like Equnix Cloud Exchange (ECX). (python)

Cisco System.Inc

San Jose, CA

Software Engineer — *March. 2015 - July. 2017*

- Designed and Developed automation framework in python. Framework is written in python using open source libraries which makes it easier for the customer to deploy. It has been developed using OOP techniques which allows end user to build platform independent and protocol agnostic test automation.
- Wrote backend libraries for the infra.
- Developed service model for Open DayLight (ODL) using YANG as data model, NETCONF and RESTCONF as transport protocol. RESTCONF is used as northbound and NETCONF as southbound protocol.
- Code reviews.

Open Networking Laboratory

Melo Park, CA

MTS - Intern — *May. 2014 - March 2015*

- Worked on two open source SDN products OpenVirteX (OVX) and Open Networking Operating System (ONOS).
- As part of ONLAB developing team I got the opportunity to contribute into various aspects of both OVX and ONOS, from developing core features like VirtualIPAddressing, CLI etc to developing testing tools like testing framework.
- Designed and developed OVXTesting Framework under the guidance of Ali Al-Shabibi.
- Learned JIRA (ticketing software), Jenkins (tool to automate testing for newly added code), git, github and gerrit.
- Fixed many bugs related to OVX, OVX-GUI, OVX-CLI and OVXTestingFramekwork.
- Developed new features for OVX like VirtualIPAddressing, link and route recovery etc.
- Developed CLI and APIs for ONOS-SegmentRouting under the guidance of Saurav Das.
- End to end Integration of packet-optical use case of ONOS.
- Learning Erlang, bug fixes and adding new feature to Linc-oe.
- Added features in Mininet to support Optical components.
- Blogged for ONF, also wrote many users guides for OVX and ONOS.

Research Experience

Wichita State University

Wichita, KS

MS-Thesis — *Aug. 2013 - Dec. 2014*

- Innovation in SDN and Throughput Optimum Scheduling Algorithm

National University and Engineering & Technology (NUST) H-12, Islamabad

Islamabad, Pakistan

Research Assistant — *Aug. 2012 - July. 2013*

- Learned SDN, OpenFlow and related technologies during the research work and gained experience on OpenFlow specification v1.0.
- Wrote many mininet scripts using mininet python API to implement different network topologies
- Programmed Pox controller to implement desired functionality such as load balancer, firewall and etc.
- Learned Pyretic and PyResonance under Nick Feamster online course as part of my research requirements and Implemented firewall using Pyretic.
- Worked on Open vswitch 1.7.1, using Socket programming (in C/C++) wrote server/client program that runs on two different (mininet virtual) hosts connected to Openvswitch (for the communication purposes).

National University and Engineering & Technology (NUST) H-12, Islamabad *Islamabad, Pakistan*

Final Year Project Research (Undergrad) - FYP *Aug. 2011 – Aug. 2012*

Mobile Visualblock Programing (MVP) is a drag and drop tool for the development of iPhone application. User just drag and drop puzzle like object and connect them to implement their logic and at the backend our tool generates its Objective-C code for the iPhone. It helps new developer to concentrate more on logic then the complex syntax of Objective-C. We as member of two successfully implemented this as our Final year Project. The project was implemented using Java, XML, apple scripting and Objective C. Initially Java library "open blocks was used to implement the interface, XML file is created by open blocks which is used to generate objective-C code. We also wrote XML to Objective C converter. We modified open blocks to create desired XML files an part of implementation. Using apple script we automated code compilation through Xcode.

Technical Skills

Programming	Python (Expert), Java (Intermediate), Erlang (Basic), C/C++ (Basic), Bash (Basic)
Networking	OpenFlow, NETCONF, RESTCONF, YANG, REST, ARP, TCP/IP, UDP, HTTP/HTTPS, DHCP, DNS, NAT
SDN Controller	ONOS, POX, OpenVirteX
Other	Linux (Intermediate), Mininet (Expert), LaTeX (Basic), SQL (Basic), Wireshark (Basic), Buck-Build (Intermediate), Docker (Basic)

Education

National University and Engineering & Technology (NUST) *Islamabad, Pakistan*

Bachelors in Information and Communication System *Nov. 2008 - Aug. 2012*

- FYP: Mobile Visualblock Programing (MVP).

Wichita State University *Wichita, KS*

Master of Science in Computer Networking *Aug. 2013 - Dec 2014*

- Thesis: Innovation in SDN and Throughput Optimum Scheduling Algorithm.

Others

2012-13 **Certificate**, Software Defined Networking (SDN) with Distinction from Georgia Institute of Technology *Online*

2014-15 **Blog**, `https://www.opennetworking.org/?p=1417&option=com_wordpress&Itemid=316` *Online*