

Software Development Engineer

Network Data Plane

ONF and its partners have been committed to enabling network operators (telco, cloud, and enterprise) embrace open networking by way of Software-Defined Networking (SDN) and white box hardware. An important part of achieving this goal has been to create open-source software stacks that the community can adopt and build on in a variety of networking areas, including datacenter fabrics, broadband wired access, optical core transport, and 4G/5G mobile core and RAN.

About the Aether Project (<https://www.opennetworking.org/aether/>)

Aether™ is the first open source Enterprise 5G/LTE Edge-Cloud-as-a-Service platform (ECaaS). It provides mobile connectivity and edge cloud services for distributed enterprise networks, all provisioned and managed from a centralized cloud. Aether is an open source platform optimized for multi-cloud deployments, and it simultaneously supports wireless devices over licensed, unlicensed and lightly-licensed (CBRS) spectrum.

One of the project goals is to build Aether Edge, a micro data center to be deployed at enterprise locations, managing multiple LTE/5G small cells for coverage and end-user device density.

About the role

ONF is looking for a software engineer to join the Programmable Data Plane (PDP) team, the team responsible for building the data plane portion of Aether Edge. We use programmable hardware, P4, and SDN software to build high-speed, low-latency packet-processing solutions in the mobile core and RAN space.

Responsibilities:

- Hands-on role, spending most time developing software
- Implement data plane algorithms for high-performance programmable targets such as switches and SmartNICs, using high-level languages and framework whenever possible (e.g., P4)
- Collaborate with switch stack developers (Stratum, PINS) to provide integration with SDN control plane via open APIs such as P4Runtime, gNMI/OpenConfig
- Develop functional and unit tests, and collaborate with QA on integration testing

- Collect requirements for mobile appliances (e.g., UPF, RAN) by collaborating with engineers from ONF operator partners and other standards organizations like 3GPP and O-RAN
- Write and/or curate architecture and design documentation
- Review pull requests from the community
- Collaborate with open source communities to propose extensions to control plane APIs whenever needed
- Help drive adoption of the technology by writing papers/technical-reports and/or giving talks in community developer events

Candidate requirements:

- Passion for and experience in open source development, with strong software design methodology and proven development skills (has taken software from concept into production)
- Interest in SDN control and data planes
- Proven networking experience, strong familiarity with L2/L3 protocols and their implementation in hardware
- Exposures to SDKs for high-performance packet processing, e.g., switch chipset, SmartNICs, or FPGA frameworks for packet processing
- Excellent troubleshooting skills and great attention to detail
- BS/MS/PhD in CS, EE, or similar technical field, or relevant work experience
- Soft skills
 - Proven ability to learn new technical concepts and systems
 - Communicate clearly, both when writing documentation and giving presentations to the rest of the organization. Can argue the pros/cons of different solutions and implementations, justifying the choices made.
 - Must be able and willing to collaborate with teams in other time-zones; Good relationship and co-working skills

Background desired:

- Software-Defined Networking
- Object-oriented software design
- Understanding of mobile and/or residential network concepts, and exposure to specifications from 3GPP, O-RAN and/or BBF

Tools familiarity helpful:

- P4, Java, Python, Golang
- Jenkins, TravisCI, CircleCI
- Git, Github
- gRPC, Protocol Buffers
- P4 test frameworks (PTF, Stratum TestVectors)
- P4Runtime, gNMI, OpenConfig
- ONOS, Stratum, PINS, Mininet
- Bazel

- Linux

About the Open Networking Foundation (<http://opennetworking.org>)

The Open Networking Foundation is headquartered in Menlo Park, CA. We are a non-profit operator led consortium driving transformation of network infrastructure and operator/supply chain business models. We are an open, collaborative, community of communities. The ONF serves as the umbrella for a number of projects building solutions by leveraging network disaggregation, white box economics, open source software and software defined standards to revolutionize the carrier industry.

We are building Open Source Tools and Platforms to *accelerate* the adoption of Software Defined Networking (SDN), Cloud infrastructures, Virtualization, and Network Functions Virtualization (NFV). We are an Open Source *development* organization with strong research, product and innovation background.

We are looking for people who are passionate about learning and who are open minded about the way cloud infrastructure and networks are built. We want people with a strong desire to implement their ideas and see those implementations used in real networks. Have you built and delivered products for commercial companies? Have you done applied research in cloud infrastructures and networks? Have you contributed to Open Source projects?

What is life like on a daily basis at ONF? We work closely with operators, partner engineers, and executives leading change in the networking industry. We develop with agile methods. We challenge each other, we brainstorm, we write code, we create new implementations that have *real impact*. We collaborate closely with both commercial and academic organizations. We have fun and we make a difference.