



# Mirantis Delivers Open Source Stack for Mobile Data Offload

**Mirantis Cloud Platform, integrated with Magma, an open source initiative by Facebook Connectivity, enables mobile network operators to offload cellular data to Wi-Fi at the network edge. South Asian MNOs are trialing the solution to meet data demands.**



Mobile network operators (MNOs) are expanding their networks and extending their mobile data services to new locations to support sustained growth in demand from users of traditional mobile devices and emerging growth from new systems such as Internet of Things (IoT) sensors and always-connected PCs. This network evolution has driven growth in the use of edge servers to provide an agile network infrastructure that can adjust quickly to changes in demand or deploy new services. Mirantis, an Intel® Network Builders ecosystem partner, meets this need through its Kubernetes-based Mirantis Cloud Platform Edge (MCP Edge) infrastructure stack and has been collaborating with [Facebook Connectivity](#) to offer wireless networking capabilities through an integration with Magma, a fully open source cloud native packet core.

## 4G/5G Will Co-Exist at Network Edge

MNOs are building their 5G networks using virtualized technology and deploying compute and storage capacity in regional points of presence to offer network and value-added services. As they build out these services, they will still offer 4G service until their nationwide 5G network is complete. Indeed, the two technologies complement each other. A similar coexistence took place in the transition from 3G to 4G networks. 3G networks are just now being sunsetted, some 9 to 10 years after the launch of 4G service in 2009 to 2010.

Because of the simultaneous use of 4G and 5G in the licensed band, and other wireless technologies operating in unlicensed (Wi-Fi, MulteFire, CBRS) bands, it will be most cost effective to federate some or all of these services into a single MNO back end. For this to work, MNOs must use a radio access network (RAN)-agnostic, converged mobile packet core with the capability to break out mobile traffic at the network edge, such as Magma.

## MCP Simplifies Infrastructure Management at the Edge of the Network

MCP Edge is designed to efficiently manage cloud infrastructure in an MNO's heterogeneous edge server environment. As shown in Figure 1, MCP Edge integrates, monitors, and manages the lifecycle of Kubernetes and other open source software to provide an edge infrastructure stack optimized for containers. It includes the Virtlet container runtime interface to enable virtual machines (VMs) to run on Kubernetes clusters to support legacy virtual network functions (VNFs) or networking functions that include both containerized and virtualized components. MCP Edge enables operators to build and manage carrier-grade infrastructure for edge services using any combination of container, virtual machine, or bare metal points of presence (PoPs).

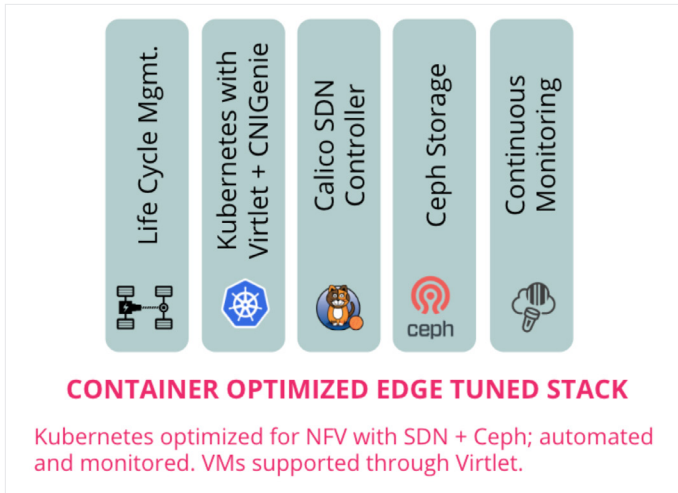


Figure 1. MCP Edge logical diagram.<sup>1</sup>

MCP Edge automates the management and orchestration of all of the open source components that are essential to the edge cloud infrastructure. This includes Kubernetes, Calico, Ceph, and Virtlet, but also the numerous other software components that are available in an MCP Edge deployment such as Prometheus for monitoring Kubernetes clusters, Grafana for source analytics and graphing, and the Gerrit code collaboration tool. MCP Edge has more than 80 open source and software components that can be utilized in a cloud deployment.<sup>2</sup>

### Integrating Magma by Facebook Connectivity Into MCP Edge

Magma is an open source software platform and is designed to seamlessly integrate with the MNO’s existing 4G evolved packet core (EPC) back end and extend its capabilities, making it possible to federate multiple wireless technologies into a single, existing mobile packet core of a service provider.

With Magma running on MCP Edge infrastructure, MNOs can not only deploy containerized services and applications, they can also extend their cellular networks, federate services from other ISPs, and launch new Wi-Fi services.

For example, one important use case enabled by Magma running on MCP Edge (see Figure 2) is offloading cellular traffic onto alternate wireless networks—primarily Wi-Fi, but also Citizens Broadband Radio Service (CBRS). Such capability makes it possible for MNOs to offload congested LTE networks by steering the cellular device connection between LTE and Wi-Fi with seamless handoff and no packet loss.

Magma runs on an Intel® architecture-based server and includes the following components:

- Access Gateway that provides network services and policy enforcement
- Orchestrator that delivers a simple and consistent way to configure and monitor the wireless network securely
- Federation Gateway that integrates the MNO’s core network with Magma by using standard 3GPP interfaces to existing MNO components

Together, these components provide a decentralized, virtualized EPC (see Figure 3), along with cloud native manageability to support ease of operations and low costs. The integrated mobile gateway supports cellular services, but MNOs can also add capacity and reach by using a Magma gateway provisioned for Wi-Fi and Citizens Broadband Radio Service (CBRS).

### Deployments in South Asia

A number of South Asian MNOs, with a combined 50 million subscribers, have chosen to deploy the MCP Edge with Magma solution. Data plans are a fast growing service offering for these MNOs, but this growth has caused a network congestion challenge due to a shortage of spectrum for these services.

To maintain a high quality of service (QoS) for customers, the MNOs are exploring contracting with regional Wi-Fi providers to offload data traffic from the cellular network to the Wi-Fi network. The MNOs are trialing the use of MCP Edge with Magma to provide this seamless handover. With Magma, the MCP Edge servers support both 4G and Wi-Fi cores and are able to federate Wi-Fi into the wireless network core.

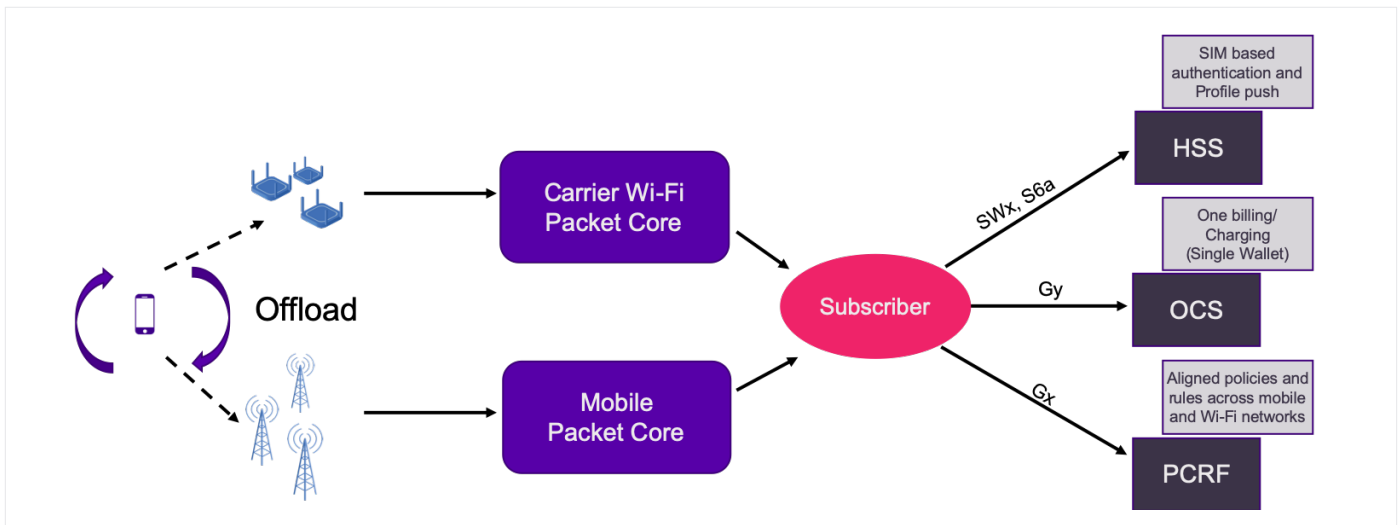


Figure 2. Offloading cellular traffic onto alternate wireless networks.

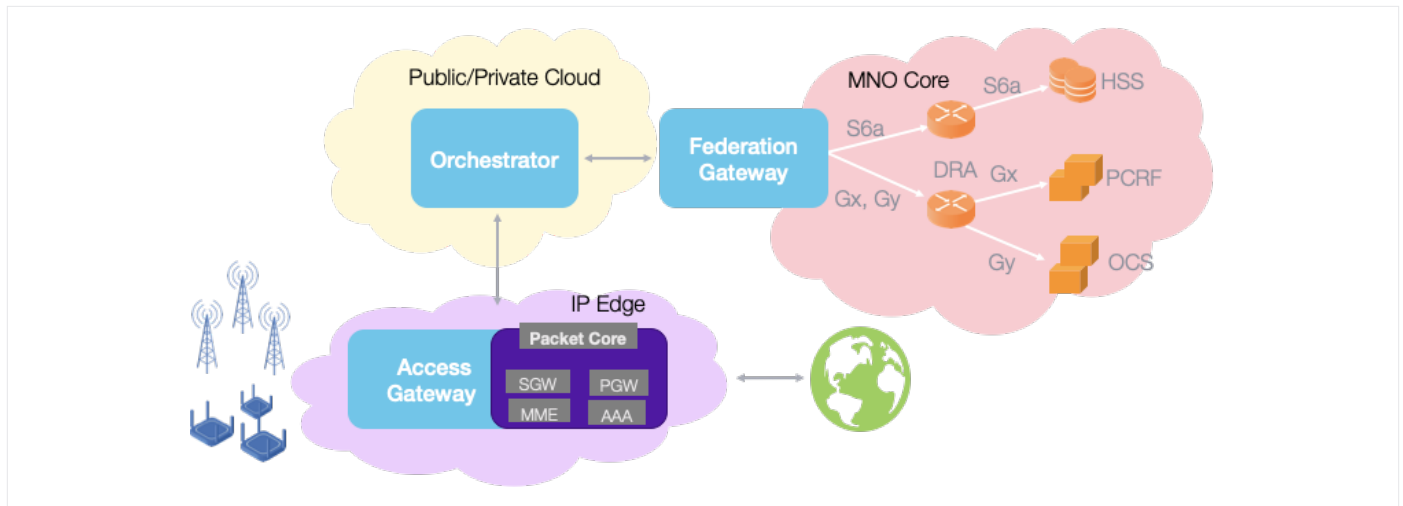


Figure 3. Network view of decentralized, virtualized EPC using Magma.

## Intel® Technology-Powered Hardware Platform

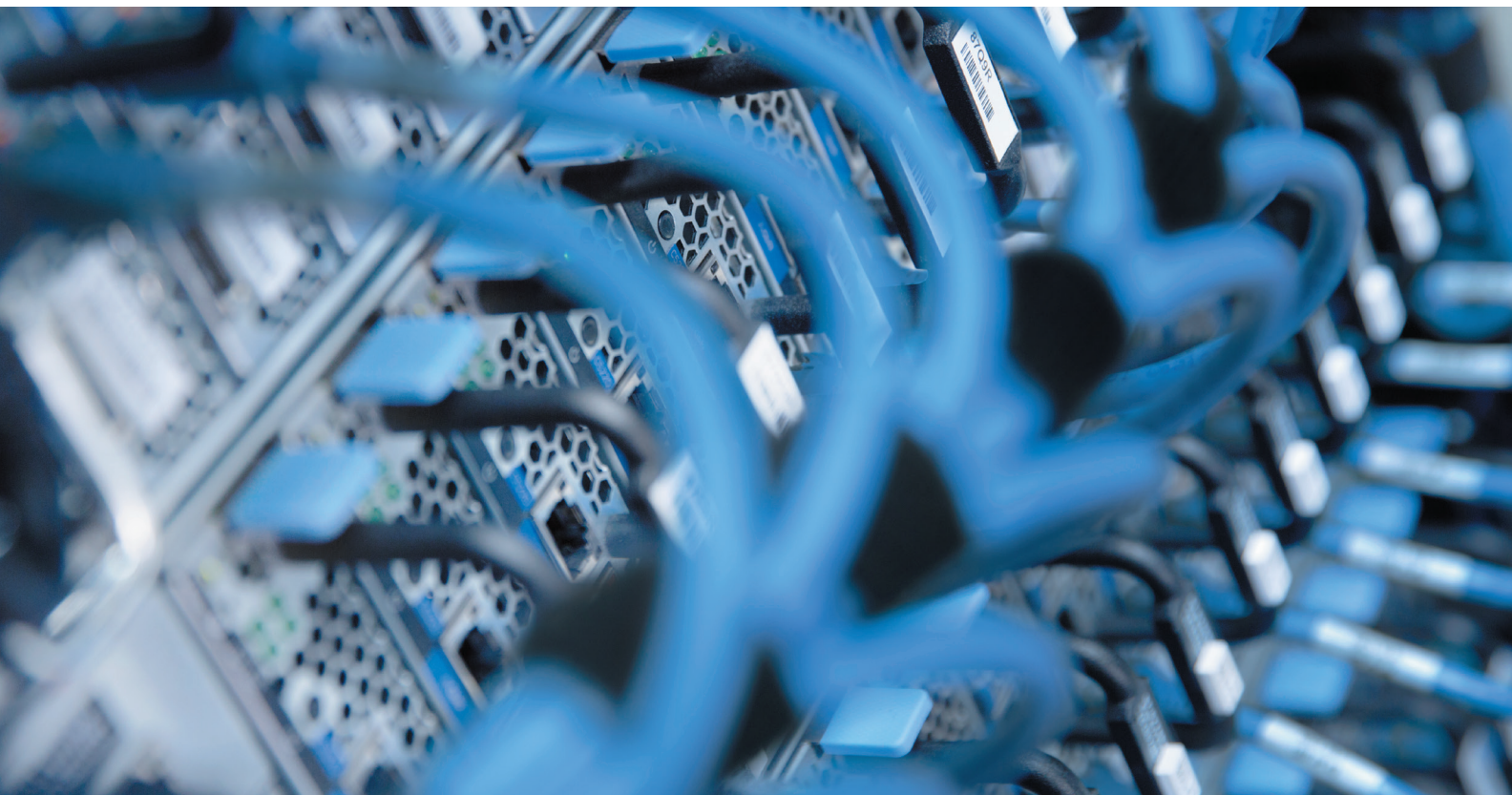
MCP Edge runs in the MNO network edge and depends on the performance of a minimum of three servers based on the 2nd generation Intel® Xeon® Scalable processors.

The 2nd generation Intel Xeon Scalable processors set a new level of platform convergence and capabilities across compute, storage, memory, network, and security. Systems built on the Intel Xeon Scalable platform can deliver agile services with enhanced performance and groundbreaking capabilities compared to the prior CPU generation. The Intel Xeon Scalable platform is designed for data center modernization to drive operational efficiencies that lead to improved total cost of ownership (TCO) and high productivity for users.

Mirantis also makes use of the open source Data Plane Development Kit (DPDK), a set of software libraries that accelerate packet processing workloads in an Intel architecture server.

## Conclusion

With MCP Edge, MNOs have a powerful capability to deploy and manage edge servers across their network. With Magma integrated, these servers can be deployed to help extend services to underserved areas and offload traffic from congested cellular networks to wireless LAN alternatives. Powered by Intel Xeon Scalable processors, the MCP Edge solution expands the value that edge network servers offer MNOs.



## About Mirantis

Mirantis helps enterprises make the move to the cloud on their terms, delivering a true cloud experience on any infrastructure, powered by Kubernetes. The company uses a unique as-a-service model empowering developers to build, share and run their applications anywhere—from public to hybrid cloud and to the edge. Its customers include iconic brands such as Adobe, Cox Communications, DocuSign, Reliance Jio, STC, Vodafone, and Volkswagen. Learn more at [www.mirantis.com](http://www.mirantis.com).

## About Intel® Network Builders

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<sup>1</sup> Figures provided courtesy of Mirantis.

<sup>2</sup> <https://docs.mirantis.com/mcp/q4-18/mcp-compatibility-matrix/compatibility-matrix.html>

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