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Evolving to a Telco Converged Cloud for a Worry-Free 5G SA

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Partner Perspectives
HUAWEI
7/2/2020

5G is embracing increasing commercial realization across the continents. Confidence across the industry is clearly visible with operators' clear strategy, vertical industries' growing interest in 5G and, successful collaborative efforts across the ecosystem. According to GSMA, 2019 was the transition period from the conceptual phase to the commercial reality of 5G, and 2020 will take it to the mass market and begin the 5G era. According to its Mobile Economy 2020 report, 5G is now live in 24 markets. By 2025, 5G will account for 20% of global connections, with take-up particularly strong across developed Asia, North America, and Europe. To support this generational shift and further drive consumer engagement, operators are expected to invest around \$1.1 trillion worldwide between 2020 and 2025 in mobile CAPEX, roughly 80% of which will be in 5G networks.

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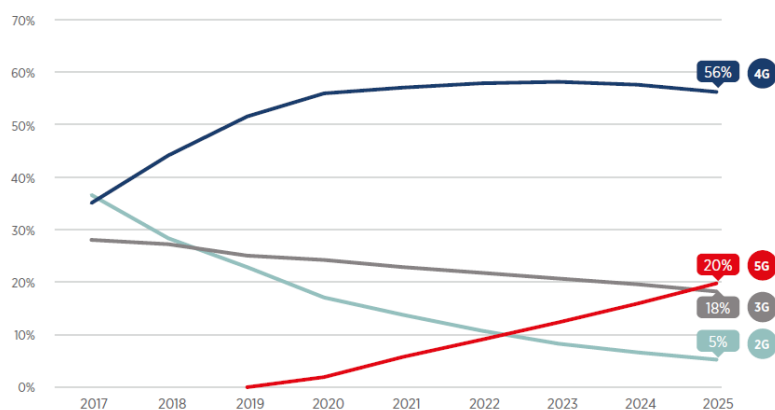
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 Huawei has developed a planning methodology and target architecture to help carriers build ultra-fast, scalable and green DCs.

[Drafted by Akik/00360602]

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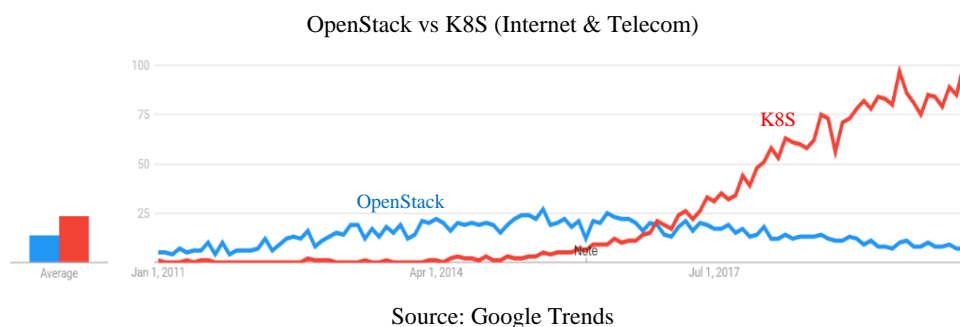
5G is embracing increasing commercial realization across the continents. Confidence across the industry is clearly visible with operators' clear strategy, vertical industries' growing interest in 5G and, successful collaborative efforts across the ecosystem. According to GSMA, 2019 was the transition period from the conceptual phase to the commercial reality of 5G, and 2020 will take it to the mass market and begin the 5G era. According to its Mobile Economy 2020 report, 5G is now live in 24 markets. By 2025, 5G will account for 20% of global connections, with take-up particularly strong across developed Asia, North America, and Europe. To support this generational shift and further drive consumer engagement, operators are expected to invest around \$1.1 trillion worldwide between 2020 and 2025 in mobile CAPEX, roughly 80% of which will be in 5G networks.

5G begins to make its mark; it will account for 20% of global connections by 2025



Source: GSMA Intelligence

Operators with new or improved capabilities of 5G mobile network developing new use cases for niche segments within industry verticals. Being the core part of the 5G mobile network, 5G Core evolves to enable a great variety of services to C to B to X; the 5G core is leveraging the cloud concept by migrating to a cloud-native core, in which network functions are modularized into micro-services and containerized to enable highly flexible scaling and function lifecycle management. “CNFs (Cloud Native Functions) are emerging as the network architecture of the future, for many of the same reasons that containers and Kubernetes (K8S) are becoming the standard platform for enterprise computing,” said Dan Kohn, Executive Director of the Cloud Native Computing Foundation (CNCF).



5G SA Needs Telco Converged Cloud:

OpenStack has been playing an important role in operators’ transformation programs for the last 10 years. In a Heavy Reading research, 84% of operators said that OpenStack has been essential or important to their company’s success. With the shifting gaze toward cloud-native technologies and specifically Kubernetes (K8S) for the resilient, flexible, scalable, and automated capabilities inherent to the architecture, the trend of increasing K8S deployment in the 5G networks becoming eminent. Container platform with K8S has 30 times more interfaces to CNF than Openstack hypervisor and yet to be standardized by the ETSI. K8S from same VNF/CNF vendor with the telco enhancement avoids introducing complex and long effort for integration test and troubleshooting, and accelerate containerized 5G service roll-out. The imperative coexistence of OpenStack and K8S infrastructure drives a necessary understanding of the requirement of converged OpenStack and K8S platform to eliminate a number of challenges in the 5G SA.

It is an increasing necessity to realize both OpenStack and K8S in a converged 2-in-1 platform in a way so that operators are able to smoothly evolve from an existing OpenStack platform to the telco converged cloud platform in a simple software upgrade, protecting legacy investments. This approach certainly eliminates a separate K8S installation and integration work during evolution to 5G SA.

A unified resource pool instead of separate OpenStack and K8S resource pools deployment certainly benefits operators to achieve simple resource management and best resource utilization, and helps to get rid of frequent manual resource provision, manual resource/blade/hardware shift during resource reuse across pools, and significant bad impact on 5G service performance.

In the 5G era probably one of the most challenging tasks is to decide an ideal solution for the

lightweight edge. Operators are expecting 10x traffic increase and 100x edge sites with the acceleration of 5G commercialization; energy and space-efficient solution for the edge sites are highly expected. The idea of a converged platform that we are explaining here should match this expectation as well. It should be lightweight, consumes fewer resources, and should have the ability to be maintained remotely.

Huawei's TCC is the Ideal Candidate:

Huawei's Dual engine TCC (Telco Converged Cloud), an OpenStack and Kubernetes (K8S) based converged infrastructure, is the ideal commercial solution to match industry need for 5G SA network. TCC is the industry's 1st hyper-converged infrastructure and platform with dual support for Kubernetes and OpenStack for both 5G core network, to B and to C applications, from central DC to light edge DC. The solution is open source based (upstream K8S, and OpenStack) with carrier-grade enhancement in both K8S and OpenStack scope, which supports smooth evolution to 5G SA.

TCC is based on in-depth convergence of Huawei's commercial OpenStack and Kubernetes release including unified resource management (URM). Better resource utilization improves 30% resource efficiency and reduces TCO too by 30%. TCC's OpenStack component incorporates various telco-level enhancements to its computing, storage, network management, installation and maintenance, security, and reliability resources. Similarly, to support telco scenarios, K8S component incorporates enhancements such as multi-tenant security to eliminate weak isolation problem between tenants, CPU isolation and binding to reduce latency, jitter, and increase forwarding performance, the full feature of NUMA affinity scheduling, flexible huge page allocation, and DPDK/SR-IOV scheduling, etc. In addition, container security enhancement, host intrusion detection, and VM/container anti-escape are implemented to further meet carriers' security and reliability requirements in the telco field.

TCC is able to support all types of computing platforms (x86 and ARM), storage, and network hardware. TCC is the perfect solution; it comes as lightweight (TCC uses 4 vCPUs, industry uses 20 vCPUs at the edge) with module flexibility (if require only K8S module) for the edge network. Huawei provides remote installation and maintenance based plug-n-play solution for edge sites; lightweight TCC is the right match as it supports remote O&M at edge site, an ideal worry-free TCO saving edge solution for the operator.

Huawei's telco cloud platform has been widely used in the industry. So far the vendor grabbed more than 700 commercial telco cloud contracts by May 2020, the majority of which are based on Huawei's FusionSphere OpenStack. All these operators are able to realize their worry-free 5G SA networks with Huawei's TCC.