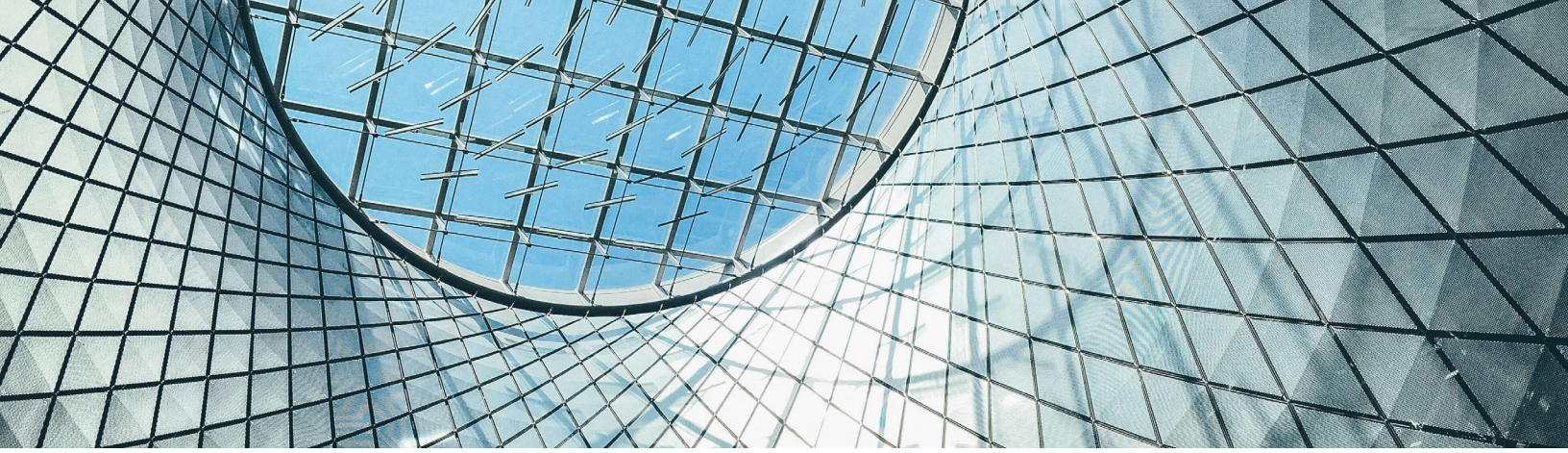

Market Insight Report Reprint

NTT Docomo, NEC achieve energy-efficiency gains running 5GC software on AWS Graviton2

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Working toward ESG and net-zero targets is already commonplace in the telecom sector. Add in regional conflicts that are driving up energy costs, and we have a perfect storm that calls for more drastic changes in network architecture with the goal of increasing efficiency.

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Introduction

The mobile telecom and public cloud industries are today closer than ever as hyperscalers (headlined by Amazon Web Services, Google Cloud Platform and Microsoft Corp.'s Azure) are increasingly viable suppliers of the underlying core and edge digital infrastructure needed to deliver in-demand telecom services such as 5G and multi-access edge computing. Hyperscalers can also be solid partners for joint business-to-business/consumer initiatives that combine network services and a highly distributed physical topology with their ever-expanding array of cloud infrastructure, platform and value-added services.

For its part, AWS is touting another interesting advantage versus legacy on-premises virtualization architectures that could trump them all: energy efficiency. A three-way engineering proof of concept (POC) combining AWS-designed Arm chips (Gravition2) with 5GSA core (5GC) software from NEC Corp., and hosted by Japan-based mobile giant NTT Docomo, has delivered impressive results.

THE TAKE

ESG and net-zero mandates are now ubiquitous C-level initiatives in the telecom space as regional conflicts drive global energy costs higher. Against this backdrop, global telcos are desperate for technology services that can materially reduce carbon footprint and energy bills. The move to telecom network cloudification that is well underway (the disaggregation of core and edge network appliances to run as software on general IT infrastructure and ultimately via cloud-native technologies and deployment patterns) has finally catalyzed a generational disruption event in how telecom networks are built and run. This has led to a flood of new participants in what had been a closed and proprietary club of telecom original equipment manufacturers and supporting telecom operational software shops.

Executing on this complex and difficult transformation offers telcos the agility and cost benefits that global enterprises have enjoyed for years by shifting their own workloads to the cloud. The complexity and disruption of refactoring core and edge applications to be truly cloud native is the greatest inertia holding back such transformation at scale. We believe the efficiency results approaching the level of what NTT Docomo has achieved with AWS/Graviton2 and NEC, along with a relatively light engineering effort, will pique interest and accelerate transformation for some operators. Over time, efficiency could end up being one of the industry's most potent digital transformation accelerators and a catalyst for AWS, trumping the near-term promises of revenue growth and agility that has been lackluster for 5G services thus far.

Details

The POC results recently shared by NTT Docomo and NEC include a claimed 72% average reduction in power consumption using AWS Graviton2 processors vs. Intel Corp.'s second-generation Xeon Scalable Processor-based infrastructure for 5G stand-alone core control plane workloads. In speaking with AWS, we learned that the joint engineering effort to effectively optimize the NEC 5GC software for porting to AWS/Graviton2 took about a couple of months from start to finish.

While the general perception of "lifting and shifting" of NFV software from X86 to Arm architectures is that it is complex and costly, in this case NEC reported a relatively smooth port while taking advantage of several features of the Graviton2 chip design such as a high-capacity memory architecture. AWS also noted that mapping one vCPU core to one physical core positively impacted both efficiency and performance results. According to the vendor, it is reasonable to assume that it has similar efforts underway with other 5GC software ecosystem leaders and AWS core network partners.

AWS offered its engineering support to NEC and NTT as it believes that investing in such a partnership accrues material benefits for the company as well as sets the stage for long-term growth of its cloud services within NTT and its peers. While the press release detailing this effort was focused solely on the sustainability results, we also learned that the raw performance results achieved parity or increased for the 5GC workloads vs. X86-based service. AWS indicated that while using Graviton2/3 as part of Outposts deployment (a fully managed edge computing stack operated by AWS within an operator-controlled datacenter) is possible, the most likely optimized path for 5GC deployments in Japan will be hosting in nearby AWS regions or local zones, which brings theoretically limitless capacity for traffic spikes.

The company's early successes and continued innovation (it is now on the third iteration of Graviton) in creating its own chipset designs using foundational Arm intellectual property hasn't gone unnoticed by its rivals. Both Azure and GCP have announced a similar intention to release their own Arm-based server designs in the coming months.

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