



Demystifying Network-as-a-Service (NaaS):

More Like
Consumer
Communication
Services,
Less Like
Cloud Services

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Introduction

Since cloud computing introduced the concept of consumption-based pricing, businesses have dabbled with the idea of buying networks connecting to cloud in an on-demand manner. Leading network service providers offer bandwidth on demand on several of the existing transport services (Ethernet, MPLS, DIA, and wireless), which allows enterprises to scale up or down as per their application needs. On-demand bandwidth offerings from leading service providers (including NetBond from AT&T, Secure Cloud Interconnect from Verizon, and Cloud Connect from Lumen) are used by many organizations for cloud connectivity, as the network service is truly integrated and optimized for easy, one-click connectivity to applications hosted in multiple clouds. Bandwidth on demand was the first instance of a Network-as-a-Service (NaaS) model nearly a decade ago.

The concept of NaaS has evolved significantly since then with deeper integration of Software-Defined Networking (SDN) and Network Function Virtualization (NFV) technologies in service provider networks. SDN enables true network flexibility and scalability, and NFV allows related network functions (routers, firewalls, VPN concentrators, WAN optimization devices, session border controllers and others) to be deployed as software. Hence, NaaS in its current form allows businesses to buy network hardware, software and services in a subscription model. It is important to note that NaaS is very different from the as-a-service model of cloud, where the underlying platforms are built to be shared and can truly flex on demand. In the NaaS model, the hardware is dedicated to a particular client and particular sites.

Therefore, the NaaS model is like consumer or residential communication services offered by cable system operators or service providers, for which you can subscribe to multiple services (voice, internet, video, wireless, security) for a subscription fee with an annual or multi-year contract. Unlike in the consumer market, enterprise networks need flexible bandwidth capabilities and access to robust network services that rely on much more complex and capital-intensive network equipment.

While NaaS shifts enterprise spend from a CAPEX to an OPEX model, it is important to note that the true consumption-based model applies only to the bandwidth that can be flexed up or down as needed. Everything else an enterprise buys in a NaaS model – hardware, virtual instances, managed services, network services – incurs a recurring charge for all active devices and functions. Depending on the terms of the contract, there is some flexibility built in for pricing change as customers add/drop devices after a certain period.

Many industry articles inaccurately conflate the terms subscription-based and consumption-based when talking about NaaS. In the residential space, technically, users can buy a compatible internet router and eliminate the equipment rental fee, but not so easily on the enterprise side. In the NaaS model, the fee recurs monthly throughout the agreed-upon period, which typically allows enough time for the provider to amortize the equipment cost. As with residential video services that you can buy for a month or year, for example, virtual network services incur a recurring charge no matter how long you use it.

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NaaS Enablers vs. NaaS Providers

Those best positioned to succeed in the NaaS market are network service providers or traditional telcos, managed service providers and system integrators that can combine network hardware, software, management, and orchestration platforms to support **network connectivity** and related **network functions** in a subscription model. For example, NaaS at a branch location would mean offering network hardware (e.g., router, switches, SD-WAN device, firewall, uCPE), software (e.g., virtual firewall, router, or any other virtual network function), connectivity (public or private, wireline and wireless services), deployment and on-going management and maintenance for a fixed monthly recurring charge. It could be argued that NaaS is a glorified form of custom managed service, with the customer paying a subscription fee for the entire service.

As enterprises show interest in NaaS to achieve greater agility, optimize technology spend and compensate for skilled IT staff shortage, several companies have jumped on the NaaS bandwagon to market their offerings. Companies in the NaaS market fall into two categories: NaaS enablers and NaaS providers.

NaaS enablers

Networking and security solution vendors such as HPE-Aruba, Cisco, Juniper, Fortinet, Palo Alto Networks and others that provide network infrastructure elements could fall into this category. While some of these vendors market and offer just the infrastructure components (such as LAN/WAN/cloud hardware and software) wrapped with a common management platform for a monthly subscription fee, ISG does not consider this to be a true NaaS offering. For the NaaS concept to deliver on its promise, carriers and managed service providers need to have infrastructure solution partners that act as enablers of NaaS. Some vendors combine broadband services through partnerships with the LAN/WAN hardware and act as a single point of contact. However, enterprise WAN needs are much broader and more complex and require a NaaS provider that can offer and manage private and public, wireline and wireless network services.

NaaS providers

Network service providers (AT&T, Verizon, Lumen, etc.) and managed service providers (Comcast-Masergy, MetTel, etc.) make up this category. These providers have invested in SDN and NFV platforms and are able to provide network services that can scale up and down as needed, along with network functions (e.g., virtual firewall or router) that can be deployed as needed. System integrators such as IBM could also compete in this space as they are able to combine the various components of NaaS and offer it as a single service. Service providers also are able to deploy, manage and orchestrate end-to-end multi-vendor solutions in LAN/WAN environments for a single monthly subscription fee.



While some vendors can deliver on technology and pricing expected from NaaS, service providers are critical to delivering on the network operations part, which is a big component of NaaS. Abstracting the management layer to orchestrate multi-vendor solutions to provide a unified service experience is a critical component of network operations, and service providers deliver on that. Service providers also are integrating artificial intelligence (AI) and machine learning (ML) tools to deliver on the promise of application-aware or intent-based networking. Intent-based networking aims to automate routine network operation tasks, set policies, measure network performance against set targets and respond and rectify the networks as needed. Solutions available today can predict and notify events. Providers are incorporating robotic process automation (RPA) to eliminate manual intervention and direct the WAN to self-correct.

Business Benefits from NaaS

Shift from CAPEX to OPEX model

The subscription-based billing model of NaaS frees enterprises from having to invest large amounts of their technology budget in network hardware and static connectivity services. With NFV at its core, network functions can be instantiated quickly on a premises-based x86 white box or in the cloud. NaaS also allows businesses to procure bandwidth on demand for certain locations where usage is limited to certain hours of the day or certain days of the week. Theoretically, NaaS can combine digital supply chain elements such as hardware, software, connectivity and managed services into one offering with enterprises paying a monthly recurring charge for it. However, it is important to note that, unlike the cloud, consumption or usage-based billing does not apply to the whole gamut of NaaS offerings. In fact, bandwidth on demand is the only feature to which consumption-based billing applies.

Keep up with technology trends

As enterprises take a cloud-first approach to their IT transformation initiatives, they realize the critical role of networks. However, many businesses are struggling to keep pace with the rapid pace of technology change. SDN, NFV, SD-WAN and secure access service edge (SASE) are technologies (and frameworks) that have gained mainstream attention in the last five to seven years. Furthermore, deployment and management of global networks are complex and time-consuming. NaaS allows businesses to better manage the technology lifecycle as trends change in the LAN and WAN space, while procuring them in an OPEX model (and eliminating the vendor lock-in challenge that comes with the traditional CAPEX model). NaaS will also play a crucial role in Industry 4.0 transformations in which IoT, edge computing, AI and ML solutions are the core. Moving a NaaS model with clear service level objectives can result in considerable cost savings and operational efficiency.



Address shortage of skilled network and IT staff

Enterprise applications are increasingly distributed across hybrid-cloud environments consisting of on-prem, colocation, edge and cloud datacenters. Pre-COVID, network managers had to worry about connecting users that were predominantly based in office locations to distributed applications. Post-COVID, with most organizations embracing a hybrid-work model, network managers now have the new task of efficiently and securely connecting distributed workforces to distributed applications. Almost every organization is struggling to upskill its network and IT staff to keep up with the new technology trends, even while maintaining existing infrastructure. NaaS, when managed network services are integral to the offering, takes the network deployment and management complexity and allows internal IT staff to focus on other strategic activities.

Faster time-to-market

As organizations look to expand globally and bring new local sites online quickly, it may not always be evident which global regions make business sense without testing the markets. With NaaS, businesses can test new markets inexpensively before investing CAPEX on branch locations. The COVID-19 pandemic has further highlighted the limitations of hardware-centric branch architectures. The fact that large portions of the workforce had to transition almost overnight to a remote working environment has escalated the challenges of shipping, deploying, configuring and managing physical network appliances. With NaaS, businesses can efficiently and securely connect remote employees to cloud/edge data centers for a monthly fee.

Factors to Keep in Mind when Evaluating a NaaS Model

Subscription-based billing sounds simpler than it is

As enticing as it sounds to move from a CAPEX to an OPEX model, subscription-based billing for network services can be complex. In the traditional model, the network hardware is purchased with a one-time fee or amortized over a three-to-seven-year contract. Take for example the monthly subscription model prevalent in consumer services. The internet router fee is built into the monthly fixed fee, a line item that can be eliminated if the consumer purchases the equipment upfront. But most consumers do not choose that approach and continue to lease the equipment. If you think of an enterprise scenario consisting of several different pieces of equipment, the leasing costs can add up, and they continue to show up on the bill for the entire contract period.

NFV-based virtual network services can eliminate hardware sprawl with NaaS models using minimal physical hardware in the future. At least that is the goal of moving to a NaaS model. Currently, the NaaS model contains quite a bit of hardware leasing, with discounts on hardware charges clearly written into the contracts. NaaS contracts also tend to run longer than traditional



contracts as cost savings (both from a provider perspective in terms of operational efficiencies and from the enterprise perspective in terms of reduced total cost of ownership) do not start to show until three years later. Service providers that are willing to take over the client environment are willing to make the investment necessary to transform the network to meet the client's business objectives, and they are willing to take on the financial risks of some equipment encumbrance and penalties associated with not meeting the outcome-based SLAs. The willingness to take on the management and financial and regulatory complexities of a global network comes at a price.

Compatibility issues with existing infrastructure

The challenge of embracing new models is managing the existing infrastructure. Considering that most organizations are considering agile, software-centric WANs only in recent times, optimizing existing investment will be critical for network decision-makers. Companies will need to either wait till the next technology refresh cycle or choose to work with a limited number of vendors that already have a presence in their WAN environment.

Enterprise network teams will need to relinquish all control of the network

The shortage of skilled network and IT staff is real. But if you speak to anyone in the role, you will realize letting go of control over the network is much harder than it seems. In our experience, companies are willing to lose some technical control that goes along with a move to the public cloud but are hesitant to release it when the equipment sits inside their own facility. In the NaaS model, while network decision-makers have the option to define service level objectives, it is completely up to the provider how it delivers on those objectives. Organizations need to actively include the internal team in the NaaS process as people care about and engage in efforts where/when they genuinely feel responsible for the outcome. Setting expectations will prove foundational and the time invested will accelerate decision-making.

NaaS and SASE

While NaaS is an evolving model with varying definitions, it is helpful to understand how SASE fits into the discussion. SASE is a framework that addresses the need for a centralized, cloud-delivered, software-defined security architecture when the applications and users are highly distributed. Enterprise security needs are too complex to depend solely on a cloud-based model. A hybrid model consisting of an on-prem and cloud-delivered approach to networking and security is more ideal to address businesses' needs. Since SASE is already hosted, managed and delivered as-a-service, it can be elegantly rolled up within the plethora of services a NaaS model offers.



Conclusion

NaaS can bring great flexibility to your organization in terms of how you consume and pay for enterprise LAN and WAN solutions and services. While the shift from CAPEX to OPEX is a big change, the entire model can quickly become unappealing without proper involvement and buy-in from network, IT and finance departments in defining the outcomes. Since NaaS is not a "plug and play" technology, nor is it a one-page service agreement to order, the question "why NaaS?" is critical.

Since enterprise networks contain a great deal of hardware, the NaaS model may not immediately yield the lower costs expected while shifting to an OPEX model. However, the freedom that comes with the model in terms of avoiding vendor lock-in for hardware and maintenance is something to consider. As NFV-based services gain popularity, the value of NaaS will become clearer as white box-based virtual services attract lower penalties over time. NaaS contracts are typically longer than traditional contracts since hardware costs take longer to amortize. With these longer terms, cultural fit is paramount when selecting a provider; spend time ensuring alignment is right for the long haul. NaaS can be a key enabler for your digital transformation goals if you understand exactly what you are signing up for in terms of technology, pricing and service outcomes.

ABOUT THE AUTHOR

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Roopa is ISG's subject matter expert in next-generation intelligent services such as SD-WAN, SDN, NFV, Cloud and 0Edge Networking, and established WAN services such as MPLS VPN, Ethernet, DIA and Waves. As part of the Network and Software Advisory team, Roopa assists clients in transformation initiatives around networking, security and enterprise solutions.

Roopa has been involved in global consulting engagements that are grounded in complex network and Information Technology transformation. Roopa has orchestrated transformations including SD-WAN, SDN, NFV based virtual network services, cloud services, UCaaS, and SIP trunking. Roopa's strong research background and in-depth knowledge on telecom technologies has helped her be part of engagements that include strategy assessments, RFP development, contract negotiations, transformation, and change management.



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