Intraway

Network as a Service (NaaS): Making the opportunity happen

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The disruption the pandemic caused gave Network-as-a-Service (NaaS) offerings new relevance, which is now driving unanticipated demand. Services like virtual private networking (VPN), bandwidth on demand (BoD), software-defined wide area network (SD-WAN), content monitoring and filtering, custom routing, and security services can each be provided via means other than NaaS. But, NaaS has become a key enabler for all these services because it lets customers manage their services consumption in a shifting remote and hybrid work environment.

NaaS market

Is growing at a CAGR of nearly **32%**

Will grow from **$11.6 billion** in 2022 to more than **$80 billion** in 2029.

NaaS market to grow 7x in 7 years

According to Fortune Business Insights, the NaaS market is growing at a CAGR of nearly 32% and will grow from $11.6 billion in 2022 to more than $80 billion in 2029. Fortune cites common use case examples, such as retailers turning to NaaS to shift capacity from physical locations to online business, as key drivers of this growth. The report adds that enterprises have become accustomed to managing services and bandwidth per location, per platform, per application, and per user or employee as a result. As enterprises adopt NaaS more, service providers need to scale their ability to deliver NaaS services massively and in step with closed-loop automation efforts.

What is NaaS?

The term NaaS describes a business model, not a specific technology. It can mean moving some network management functions to the cloud, or it can mean a fully cloud-based virtual network. It can provide a VPN, an SD-WAN, or any other Internet-based architecture. Important parts of the network, including entire subnets, may reside on premises. Features that are commonly available include:

- Network management
- The connection of local networks into a WAN
- Dynamic or static routing
- Network security
- Monitoring

- DoS protection
- VPN tunneling
- Bandwidth on demand (BoD)
- Network function virtualization (NFV)

In many NaaS configurations, the cloud service provides a gateway from the local network to the Internet, and all Internet traffic goes through the gateway. This gives cloud-based security and management tools full control over network traffic.

Why is NaaS Important?

When customers have a problem to solve, it's an opportunity for providers. This is the basis for well-known models such as SaaS and IaaS. An "as a service" package uses economies of scale to deliver services at an attractive price while saving the customer the complications of installing and maintaining their own. They make access more flexible and can scale up when needs increase.

Network services not only are a business opportunity in themselves for telecom companies, but also encourage customers to increase their use of the provider's basic services.

Providers need to meet a high level of expectations to win customers over to NaaS. Network owners will be naturally cautious about handing over any control. The provider has to get high marks on all the important aspects of service.

Availability and reliability need to be very high. Service agreements need to guarantee an uptime level, and the service needs to live up to the promise. Performance has to be good, both in speed and quality of service. The service needs to be cost-effective. Customers looking at NaaS don't necessarily expect huge cost reductions, but they expect better network operation without paying significantly more. And security must be impeccable.

Key NaaS Services

The services grouped under NaaS cover a broad range. A service provider may offer some or all of them, separately or in packages.

Cloud-based VPN

Companies have traditionally hosted their own VPNs for secure remote access. Employees in remote locations can access internal network resources securely. The alternative to hosting the VPN in the cloud is becoming more popular, especially for small businesses. It reduces the need for hardware and maintenance, as well as making it more convenient to connect multiple locations and incorporate cloud (SaaS or IaaS) services.

Client devices can access the VPN regardless of whether they subscribe to the provider's telecommunication service. A good VPN service uses one of the standard tunneling protocols and makes software available for all major mobile and desktop operating systems.

SDN and SD-WAN

SDN (software-defined networking) and SD-WAN (software-defined WAN) are related but distinct concepts. SDN is a technology which separates management and configuration of a network from the routing of data. An SD-WAN is a wide-area network which builds on SDN technology and allows centralized management. Either way, centralizing network management by putting it into software is a natural fit for the cloud.

The network controller is the hub of an SDN architecture and can be its weakest link. It needs to manage all locations of the network. A cloud-based network controller is less susceptible to hardware failures, and it can scale up as the network grows. The controller has to be especially secure, since compromising it would compromise the whole network. A cloud-based network controller that maintains the highest security standards is a strong selling point.

Network Slicing

The combination of NaaS and virtual machines leads to a cloud-based network where nothing is on a dedicated piece of hardware. Everything is virtual: the servers, the firewall, even the routers and switches. Combining this with infrastructure as a service (IaaS), and customers can create servers, configure them into networks, and tear them down at will.

This approach combines detailed, low-level control of the network with any desired amount of scalability. Adding a network, either permanently or for transient use, is just a matter of configuring it with an application.

Slicing allows customization of a network for a specific purpose. IoT sensors, VoIP phones, and database servers all need different network characteristics for optimal performance. A virtual network slice can be optimized for any set of requirements. One might serve IoT sensors, another one smartphones, another one VoIP. The network characteristics are defined in software, so networks can be spawned and optimized as necessary.

Security Features

Cloud-based security management is popular, largely because threats are constantly appearing and security measures need to keep up with them. These services can be offered separately as Security as a Service (SecaaS) or as a component of NaaS. Security is a necessary part of any network service, but it stands out most clearly in cloud-based firewalls and NGFWs.

Other security features that can be part of NaaS are DDoS protection and network monitoring. Cloud services are more resistant to DDoS attacks than the typical on-premises network since they have extra resources on call. Monitoring software can be constantly updated with the latest threat signatures.

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Bandwidth On Demand

Adjustable network capacity with bandwidth on demand (BoD) can help a network to ride out surges in usage without performance degradation. Organizations and locations with extreme fluctuations in demand can benefit the most. For instance, a weather reporting organization will need much more bandwidth than usual when a severe storm is coming.

One approach to BoD is to schedule extra bandwidth in advance, on a regular schedule or for a planned event. When customers schedule it, they expect that they will get it reliably and not experience slowdowns. The other approach is to request extra bandwidth when the need arises. In this case, it may not always be available, but it should be available most of the time.

NaaS Operational Benefits

NaaS can offer considerable benefits, operational efficiencies, and business agility, which derive from three key components:

Functional elements virtualization: Functional elements are virtualized under NaaS and hosted on a standardized blade-server farm. This step facilitates a uniform operational approach across multiple elements, giving better consistency and repeatability, and also promoting integration simplicity.

Active service catalog creation: An active service catalog represents all of the functional elements that have been virtualized and identifies how they map to both the services that rely on those elements and the customers who consume those services. The catalog defines the policies through which they can interact.

Process automation: The active service catalog and the virtualized elements allow automation of operational processes. This combination eventually benefits OpEx, while increases business agility and customer satisfaction. To analyze the advantages of NaaS, research turned to the enhanced telecommu-

nications operations map (eTOM) process framework to identify the operations and infrastructure processes impacted. By comparing the future-state processes under NaaS to current-state processes, and identifying the differences in time and resources consumed under each scenario, it is possible to see the real benefits.

Impact on Resource-Centric Processes

NaaS can deliver significant benefits across three resource-centric processes: provisioning, trouble management, and management support and readiness.

Provisioning

The concept of provisioning refers to the configuration, deployment, and management of network elements. It requires the existence of networking equipment and depends on network planning and design. Today, to deploy an element or function, the operations group first orders a stand-alone machine from the vendor, and then racks and stacks the machine. This process alone can take several weeks. The physical hardware then experiences a burn-in period, which generally lasts a day or so. Finally, the application is configured, tested, and activated onto the live network environment. From beginning to end, the entire process can take anywhere from several weeks to a few months, and require one to two full-time employees. In a NaaS environment, this process is greatly simplified, and the timeline significantly reduced, as the Operations group doesn't need to wait for delivery of the new hardware or to engage in testing. Instead, it merely either provisions a new application instance onto a virtual machine or expands the license terms of an existing application instance to increase its capacity.

Trouble Management

Trouble management entails surveying and examining problems on element resources, localizing the source, and then fixing and resolving the issue. Today, analysts in Network Operations Center (NOC) control physical machines housing each network element, utilizing both general network management tools and dedicated element managers. They study alarms and other events from stand-alone hardware and the applications themselves, and if they cannot resolve these instantly, they escalate to higher tiers of support. Higher support tiers, in turn, find the problem by performing specific tests using a variety of ad-hoc tools. Lastly, the NOC analysts correct and resolve the issue by addressing the root cause.

This is a highly manual and complicated process that demands extensive subject-matter expertise in the NOC. The NaaS environment streamlines the trouble-management process significantly. From a hardware perspective, rather than monitoring individual stand-alone physical machines, the NOC monitors a single blade-server farm. Blades are configured according to a set of standards, and therefore, on average, they are more stable. It is also simpler to localize issues by using better and more standardized tools, standardized hardware and configurations.

Many common events or difficulties can be solved automatically with simple scripts, avoiding the need for human interaction. For example, if a blade is found to be faulty, a workflow can be triggered to replace and reprovision the blade quickly, while the virtual machines requiring that blade are automatically reassigned. In this way, NOC staff at multiple tiers can be redeployed as more events, and outage resolutions are automated. By standardizing hardware, simplifying troubleshooting, automating outage resolution, and increasing the percentage of trouble resolutions at Tier 1, efficiency in the trouble management process can be improved by 30 to 50 percent.

Management Support and Readiness

Management support and readiness refer to proactive monitoring of network and IT resources, such as packet gateway servers and IP services, to guarantee maximum performance, while also maintaining the resource infrastructure. Typically, the Network Operations group monitors stand-alone applications on dedicated hardware to ensure that they are performing to specification. For instance, Network Operations controls the CPU and memory and keeps workloads according to preset engineering guidelines. It also applies vendor-issued software patches and updates.

In a NaaS environment, the effort demanded by these processes is reduced, primarily because hardware health and performance tuning can be standardized and automated — a benefit of being in a virtual environment.

Impact on Service-Centric Processes

NaaS will also positively impact on three service-centric processes: sales, service configuration and activation, and service development and management.

Sales

Sales processes include the typical consultative sale where an account team engages the customer to secure an order. Depending on the service, this often follows a complex sales cycle and involves multiple sales calls to perform site surveys, collect customer requirements, agree on pricing, and, ultimately, draft a contract that incorporates the final solution.

For complex sales, this process is highly manual, requires a skilled sales force, and is prone to errors. Solution designs are often misconfigured in the service order, and eventually, the correction costs both the customer and the service provider priceless time and effort.

In a NaaS environment, the sales process is seamless, requiring almost no intervention from the sales department, which results in fewer errors. Some customer segments could access the active service catalog through a customer portal and use it to design and configure their solution directly.

The service catalog would be rules-based to produce only practical solutions, and it would have a built-in price configuration tool, thus eliminating solution and pricing configuration errors. Alternatively, the sales organization could access the active service catalog through a dedicated interface, producing the same advantages.

Once the user arrives at a given solution design, such design would drive the service order engine, eliminating another potential source of errors. Some analysis shows that by minimizing sales involvement through customer self-service and by providing rules-based pricing and solution design, efficiency could be improved by 25 to 80% in the selling process. Customer satisfaction would also grow as a result of shortening the sales cycle and reducing errors.

Service Configuration and Activation

It refers to the process by which a customer order is turned into a service order and eventually provisioned onto the underlying network and application resources upon which the service relies. Today, service configuration and activation is typically a manual process with little automation. After a customer has signed a service agreement, a manual workflow tool creates a service order and assigns individual work for each network element or resource to be provisioned. Because of unique customer requirements, the service order usually involves a "special project," which is difficult to standardize or automate. The result is a complicated and prolonged service configuration and activation timeline, requiring dedicated and skilled resources.

In a NaaS environment, it is possible to achieve a higher level of efficiency. First, a service order emerges as an output of the selling process, which

is created using only standard configurations generated by an active service catalog.

Customer orders requiring nonstandard configurations are exceptions and are still handled manually. However, these new configurations are then incorporated into the active service catalog so that, in time, only a small percentage of customer orders require a particular project. The active service catalog contains rules for how the service configuration maps to underlying resources (network and IT elements and features), so service activation is achieved automatically via flow-through provisioning of those resources.

To a large degree, the manual workflow associated with individual work orders is eliminated; instead, the process is driven by an activation engine, fed by the electronic service order, and guided by policies in the active service catalog. By eliminating manual workflows, cutting service configuration rework, and automating service configuration, companies can improve their efficiency by 50 to 100% in the service configuration and activation process.

Service Development and Management

Service development and management involve developing a strategic vision and multi-year services roadmap. Delivering new or enhanced services includes implementing new processes and systems, developing new capabilities to provide new functionalities, and testing and rolling out the new service.

New service creation is cross-functional and requires significant interaction. Under NaaS, existing virtualized components reside in an active service catalog, so assigning them to a new service follows a standardized process, with well-defined templates and interactions that do not impact on other services. Furthermore, any required new service components are easy to add to the active service catalog, according to a standardized set of procedures that define the relationship with other components in the catalog.

This decoupling of services and resource components makes it simpler to build and orchestrate new end-to-end services. It also ensures maximum reuse of shared resources while limiting disruptions. For example, product managers do not need to engage Engineering, Operations, and IT teams in endless product implementation meetings and workshops, which is typical today. Instead, product managers select a subset of the features and then determine how to integrate any additional functions that are not already included in the catalog.

By freeing up product managers to focus on strategic roles, enabling customer-driven innovation, and developing standardized flexible and reusable configurations, efficiency could be improved by 25 to 75% in the service development and management process.

Launch NaaS on an automated foundation

Customers are looking to their telecom providers for solutions to their networking problems. The services that go under the umbrella of NaaS are an important part of what the providers can offer, and they're growing more important every year.

NaaS covers many kinds of services and isn't a single thing. All providers already offer some of the functionality that goes under the name. They can expand the range of offerings and assemble them into packages. Starting points can include firewalls, VPNs, and network monitoring. From there, the provider can expand into SDN and SD-WAN services, bandwidth on demand, and other advanced features.

As the NaaS market begins to expand and enterprises shift how they consume tech services, including communications and networking, service providers will want to ensure they can get to market and scale their NaaS offerings quickly. Launching from the start with no-code, zero-touch automated orchestration, provisioning, and activation behind their offerings will permit the type of rapid market entry and expansion NaaS markets are beginning to experience.

Intraway

Intraway has radically simplified Telecom OSS

With over 40 million subscribers successfully served in more than 20 countries over three continents, **Intraway** specializes in driving fixed-line and wireless operators' Digital Transformation projects with a 100% success rate. Supported by a staff that clients claim is a natural extension of their team, Intraway supports telco cloud initiatives for operators looking to reduce OpEx and migrate BSS/OSS functions to the Cloud.

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