Enterprise Opportunities Beyond The Pipe

The Second Network

A Technical Paper prepared for SCTE•ISBE by

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1. Introduction

For many service operators—service, value, and revenue begin and end with the broadband pipe which is the primary commercial connection between the service provider and the consumer. But as networks evolve and the needs of business customers continue to grow, one of the largest opportunities for increased monthly recurring revenue, churn reduction, and customer service takes off where the first network ends: beyond the pipe.

Service providers are delivering on the promise of the "first network", broadband, at very large scale, but aren't fully leveraging their opportunity to deliver the "second network" to their customers. This second network is beyond the pipe and typically consists of router / firewall, switching and Wi-Fi access points to facilitate the day to day operations of the business. In the business segment we estimate that broadband penetration is over 80%, but second network penetration is very low, estimated at less than 10%.

The second network opportunity is significant. As an example, in the SMB market, with less than four access points, there is a willingness to invest by the business. A typical entry broadband circuit for a business will be in the range of $100 per month. A managed networking offer that consists of a router, switch and APs significantly increases the target addressable market. Business owners are often willing to invest another $100-$200 per month in their internal network solution that offers security, wired and wireless connectivity that is proactively monitored and maintained. The monitoring and maintenance of the second network is now business critical to business owners. As bandwidths available to the business regularly exceed 100Mbps, business owners are relying more and more on secure network connectivity to cloud based customer management, accounting, payroll and Point of Sale services for their daily business needs. These cloud-based applications simplify the business owners' operational requirements and allow them to leverage cloud-based economics for their business applications, but connectivity is no longer a convenience, but a necessity.

Managed enterprise networks involve more than just installing Wi-Fi equipment and incidental hardware for customers. They are in fact fully managed services where the operator is responsible not only for providing and installing the equipment, but customizing it to match the customer's needs, managing it on their behalf, and providing value-added services on top of it. The typical Managed Networks digital experience that provides a sticky engagement with the customer both from a branding point of view as well as useful customer engagement around second network status and analytics specific to their business. With these deeper second network solutions, Service providers can significantly increase their value to their customers across all enterprise business types, large and small. Service providers do have an opportunity to further enhance their value beyond the "Second Network" once they have reached beyond the network edge. This opportunity is delving further into the business with additional value-added services such as video security and other managed IOT offerings that a typical business owner needs but doesn't have the IT resources to deploy and maintain.

The immediate benefits for operators as well as their business customers are obvious: Customers have access to professionals who manage the entire install, setup and operation of their entire network. Because they don't have to be their own network support organization; they can focus on their core business. A single provider that delivers both the first network and the second give the enterprise a single point of contact if they need assistance with the network or the service. For operators, this value-added relationship not only provides more sticky touch points with the customer, but it also represents the opportunity for revenue through equipment sales as well as recurring revenue through network management. As business networks evolve, so too can operators' role beyond the first network, also known as the pipe.

Value added services such as the second network are instrumental in maintaining service provider wallet share. Legacy services including broadband, voice and video are at high and consistent penetration levels across the service provider customer set, which leads to commoditization. Service providers are in a fantastic position to expand their portfolio and increase their customer value. Increased customer value is key to reducing churn and preserving service pricing.

This paper will provide an in-depth review of the market opportunity operational considerations for delivering effective managed enterprise networks. It will also feature a case study with a major US operator to illustrate the challenges and upside in moving past the demarcation point to owning the second network.

2. What is the second network?

The second network, depicted in Figure 1 below, is what business users connect their devices to in order to access the internet. This behind the broadband pipe enterprise network is typically composed of a router and firewall platform, Power over Ethernet switching and Wi-Fi access points with enough scale to provide adequate performance and connectivity through the business. This so called second network is viewed by many non-technical users as simply "Wi-Fi", but people in the know realize that behind every great Wi-Fi experience there's a fantastic wired backbone. The fact of the matter is every first network, the broadband pipe, is completely unusable without the second network and many times do-it-yourself solutions are under specified, poorly installed and many times not secure. The other fact we all know is the perception of the first network can be severely impacted by the stability and performance of what is deployed behind the pipe. These can be impacted by poor design practices, poor installation practices, inadequate equipment and/or cybersecurity breaches.
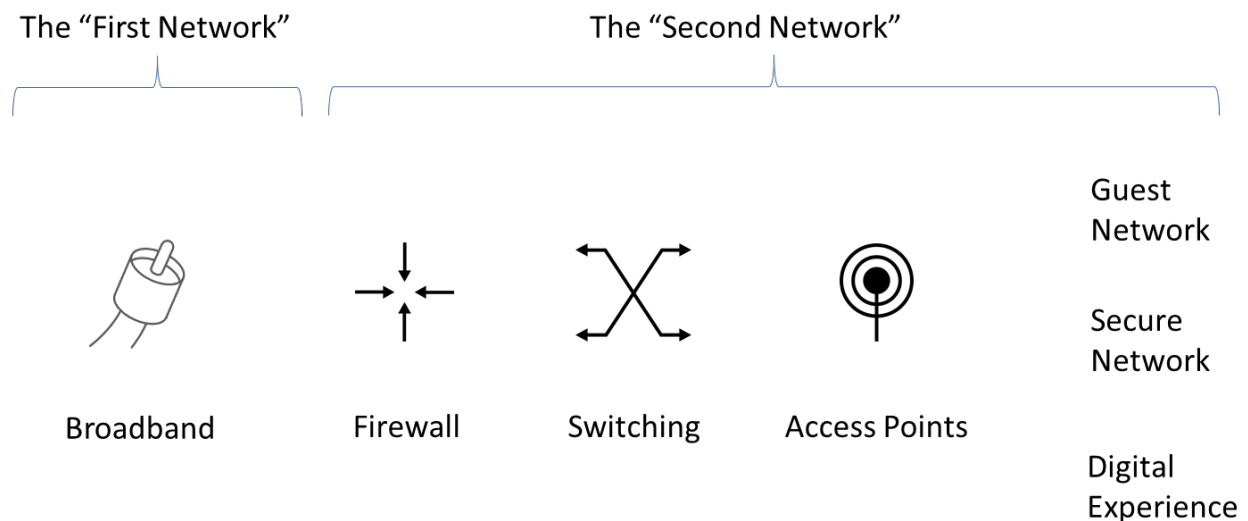

Figure 1 – The First and Second Network

3. How large is the second network opportunity?

The second network opportunity is very large especially when all applicable vertical markets are considered. The addressable vertical market with a second network offering spans across several different enterprise business types including SMB, hospitality, Multi-dwelling unit, mid-market and large enterprise. For the purpose of this paper we focus on the SMB market in the interest of brevity, but the second network TAM is significant across all verticals.

The target addressable market (TAM) of the small to medium business (SMB) segment alone is approximately $6B per year for broadband alone. Research group Gartner defines SMB "by the number of employees and annual revenue they have. The attribute used most often is number of employees; small businesses are usually defined as organizations with fewer than 100 employees. The second most popular attribute used to define the SMB market is annual revenue: small business is usually defined as organizations with less than $50 million in annual revenue."[1] According to the Small Business Administration there are 30.7 million small businesses in the United States alone employing millions of Americans. Of those small businesses there are approximately 5-6 million that employ people and likely need internet access at their place of business [2]. This segment broadband TAM is in the range of $500M per month assuming a conservative business circuit price of $100 per month and 5 million SMB locations that need internet access.

In this SMB segment, the broadband TAM is just scratching the surface of the total networking opportunity. This is because every business needs a highly reliable network on which to run their operation and are more than willing to purchase the solution from their broadband service provider. Our world's dependence on connectivity has reached utility level especially with the prevalence of cloud-based services for point of sale, customer relationship management and financial accounting. A rough estimate of the second network TAM is estimated to double the broadband TAM at a minimum, perhaps even 1.5 to 2 times the TAM. A rough dollar estimate is $500M to $1B per month depending on the product offer or as stated previously $6B annually. This estimate is limited to the united states due to market data availability, but the true opportunity is worldwide.

Keep in mind that SMB is just one vertical segment that can benefit from a second network offering. The service provider TAM outside of SMB can be expanded to Mid-market, Hospitality, Multi-Dwelling unit, etc.

4. What is required to operationationalize the second network?

Providing the second network has many operational considerations that must be addressed as part of a new product launch. Service providers have nationwide scalable expertise in the deployment of circuit related infrastructure, but because most are not broadly addressing the second network they need to thoughtfully prepare. Addressing the second network requires more advanced networking and wireless pre-sales, design, deployment and operational capabilities. The figure below depicts some of the key capabilities that are needed as service providers take their second network journey starting with product planning and moving into product launch and product operations.

Product Definition		Product Launch	Product Operations and Support	
Planning	**Design**	**Deployment**	**Operations**	**Support**
Market Analysis	Solution Design	Technical Interview	Core Platform	Tier 1 End User Support
Technology Evaluation	Technology Selection	Program Management	New Release Mgmt	NOC (Tier 2)
Product Definition	Solution Integration	Wired Wireless Design	On-Boarding	Tech Support - Product (Tier 3)
Proof of Concept	Playbook & Process	Equipment Procurement	MACD	Engineering Support (Tier 4)
Existing Product Audit	Network Security	Product Logistics	Hosting	Repair and Return
Proof of Concept	Market Trial	Product Installation	Vendor Management	On Site Support
	Sales Training and Tools	QC & As-built	Reporting and Automation	

Figure 2 – Operational Capabilities

As service providers start to address the second network opportunity across verticals, the most careful consideration must be given to defining a very concise product definition tailored to the vertical market as necessary. Each vertical market has different nuances and desires. For example, SMB users want a very simple, reliable solution that is rapidly deployed by the service provider. Mid-Market, MDU or hospitality have more complex requirements and typically require a different product definition. Service Providers are best positioned to address the high-volume opportunities that can be served by a repeatable product definition. The well-defined product with a repeatable architecture and feature set will lead to a more scalable solution that is easier to deploy and support longer term. Managed enterprise services bring the service provider into a realm of a myriad of vendors and solutions that can quickly overwhelm engineering, deployment and operations teams if the service provider doesn't have a structured approach to addressing new Second Network opportunities. There will be a tendency to address every second network opportunity that presents itself, but there must be a method of controlling what non-standard or Individual Case Bases (ICB) projects are pursed. Service providers who establish an ICB control board can determine which of these opportunities will be scalable and repeatable in the future and make good business sense to productize.

Once a clear product definition is established the service provider's engineering organizations supported by the vendor community need to select and integrate a technology platform that will deliver the capabilities of the product definition. This development process can be iterative and time consuming depending on how many different equipment suppliers are involved, the level of pre-integration already performed and the complexity of the vertical market's requirements. There are two portions of a new product launch that are often overlooked are the OSS / BSS order to cash process and the back-office reporting and customer facing self-service dashboard platforms. The integration of these platforms typically involves service provider IT resources and need to be addressed early and often in the development cycle.

Typically, after, but preferably before, system integration efforts are complete and a market trial has been successfully executed, it's time to start training sales, sales engineering, day two support organizations, design and deployment organizations and preparing for life cycle management. Sales and sales engineering training and tools is where a significant investment needs to be made when launching a second network offering. The typical service provider sales teams are used to a very short sales life cycle

and positioning a broadband product that has a pretty clear value proposition and a very limited set of competitors. The second network is very different and requires some level of retooling including training and sales incentive plan adjustments. There are two typical second network products that sales teams will be asked to sell. One will be very standard and meant to serve end customer locations that are less than approximately 15,000 square feet. This product will be easy to position and will typically be sold via an inside sales channel based on the square footage of the business. The second network product to establishments that are over 15,000 square feet is where the sales and sales engineering teams need to be trained and incented to sell. The larger and more complex second network sites will require pre-sales quote tools and outside sales executive and engineering teams that can help interview customers to understand the requirements of their deployment from an existing infrastructure, features and scale point of view. This technical interview will determine if the property fits into the standard product definition, the scale of the deployment, the complexity of any required construction and the wireless coverage areas. From this technical interview the Sales executive and sales engineer have the information they need to create a quote for the prospective customer. A key to collecting this information is well defined survey tools for the account team to leverage as input to budgetary quote tools.

Assuming the outside sales team is effectively trained to perform a survey of the customer and the physical location, the next critical step in the operational journey is to manage and build the complex second network opportunity funnel. The smaller sights are straightforward to managed, but a key to developing and managing this funnel for more complex sites is a rough order of magnitude quoting tool. The rough order of magnitude quote tool removes sales quote friction by providing a simple self-service mechanism to generate complex second network proposals. Traditional manual quoting mechanisms in the complex second network space are too labor intensive and costly, but most importantly slow. If service providers are slow to turn around proposals to their prospective customers, it's very likely they will lose to local competitive options. With an online rough order of magnitude calculator, the account and sales engineering teams can quickly interview a customer and provide a proposal within minutes. Removing this sales friction will drive funnel growth and result in a viable business.

Now that the service provider has a second network product and a sales organization closing business, it's time to start designing and installing new properties. The simple second network that suffices for a less than 15,000 square foot location is sold and delivered on an inside sales and ticket basis. The installation technicians must be trained on equipment installation best practices, deal with sometimes complex ethernet cabling and the nuances of enterprise Wi-Fi access point deployment to maximize coverage and performance. Another key component of the simple second network deployment is trying to simplify scheduling of the deployment. Where possible service providers should build processes to facilitate a single truck roll to install broadband and the second network assuming a new customer acquisition. This will create a better customer experience and reduce expenses related to deploying the new customer. For larger second network deployments that have a varying number of network components such as routers, switches and Wi-Fi Access Points, a design and deployment program management team to assist sales and sales engineering with creation final bill of materials with the assistance of design engineering and ensuring resources are available for the installation are critical. The design and deployment team help shepherd a project from customer contract, through the wireless, physical and logical network design process, the deployment process all the way to ensuring final as builts are captured and customer acceptance is received.

As new properties are onboarded, engineering and operations teams that can support past the edge and into the premises with complex Wi-Fi and networking systems that have a variety use cases helps ensure the ongoing customer experience is a high quality one. Tier 1 end user support and network operations teams will need to be trained to now support issues that are past the first network. This is facilitated by as builts that are captured by the design and deployment PMO and field services teams during the

installation and quality check process. The as-builts provide network diagrams, network element location, photo evidence of a quality installation, performance results from day of install quality checks, customer acceptance and even a customer survey. This as-built information is an excellent source of information to help Tier 1 and NOC agents perform move, add, change, delete requests, as well as debug and support the second network through its lifecycle. The NOC teams are supporting service delivery and assurance tasks associated with the deployment of properties and have the capability to support end customers that can exist past the circuit. The most critical function of the NOC related to the second network is providing a proactive response to second network outages and anomalies. Traditionally service providers are providing a reactive approach to service assurance, i.e. waiting for the customer to call to report an outage, but a proactively monitored solution is a unique value proposition and a significant differentiator. The proactive monitoring offering is enabled by advanced reporting and analytics that reaches behind the first networking demarcation point and into the second network infrastructure. Advanced second network reporting and analytics at the Tier 1 and NOC level is also critical to implementing a continuous improvement plan around technology and operational execution. This depth of insight is a tremendous value to the second network customer versus the reactive response nature of a typical broadband offering. This enables a one number to call solution for service provider customers, which is a very compelling proposition.

Finally, a retooled cloud operations team is also needed to scale a second network product offering. This team is responsible for operating the back-office technology associated with the second network and advanced debugging of property level issues related to the second network. The Wi-Fi, switching and routing systems ideally have cloud-based systems that provide a second network element management systems, differentiated customer self-service platforms, device authentication, reporting, analytics and other technology associated with the second network. One of the most critical components of the cloud team is facilitating automation of property deployment and flow through provisioning. This is not only critical to scalability, but also repeatability of deployment that leads to lower day two support costs and higher customer satisfaction.

In summary, launching a second network product offering touches nearly every part of the service provider operational organization from sales, to engineering, to operations, to support. This effort is more than worth it given the opportunity to increase the target addressable market and become a more valuable partner beyond the pipe.

5. Altice Business Smart Wi-Fi Case Study

A smart small business is a connected business. Today, both employees and customers not only expect but require reliable connectivity while working, shopping or waiting. A secure private Wi-Fi network now a business-critical item, whether the office footprint is 100 square feet or 100,000 square feet. The service providers are responding to the demand. Small business owners and property managers are focused on obtaining practical, turnkey onsite Wi-Fi capability that just works. Beyond connecting employees securely to boost office productivity, guest Wi-Fi is a customer experience definer that can build positive relationships with visitors and vendors while reinforcing the business brand. In many cases though, it is and can be, the opposite whereby the Wi-Fi is more a detriment due to it being complex and/or underperforming. This will yield the opposite effect business owners are trying to achieve as they are aware the better the Wi-Fi the longer the customer stays, yielding higher revenues.

In addition to serving 4.9 million residences, Altice USA offers voice, data, video and security services to more than 400,000 small and regional commercial businesses, nationwide. Altice Business' managed Smart Wi-Fi solution is a seamless, carrier-managed wired/Wi-Fi network for locations requiring indoor

or outdoor wireless coverage along with wired connectivity, from workspaces to churches, from coffee shops to cultural centers, from medical offices to car dealerships.

Altice Business customers are freed from tedious network configuration tasks, but can offer Guest Wi-Fi to their customers, manage network names (SSIDs) and analyze statistics such as the number of guest Internet users and bandwidth consumed during specific hours of the day and days of the week. The Smart Wi-Fi product enables Altice Business to serve businesses with up to 250 guests and employees and deliver speeds of up to 1 gigabit per second (Gbps), with coverage spanning 24,000 square feet indoors and 12,000 square feet outdoors.

Altice Business Smart Wi-Fi combines both private and guest networks, each with separate access controls. Guest Wi-Fi includes a self-service customizable splash page providing branding and promotional opportunities for the business owner and Altice Business. Content filtering is also offered on the Guest network to enable a safe browsing environment. The business owner can also survey guests as part of the onboarding experience and report on the results of their surveys via the guest experience. For business employees and internal use, Private Wi-Fi includes encrypted private wireless networks for point of sale and other back office use cases in the business. Devices connected to the Private Wi-Fi network can also quickly and safely access wired systems like printers and servers while being protected from cyberattacks from outside the business. Altice Business is helping its customers by creating a high-performance offering that gives SMBs the simplicity and reliability they need to grow their bottom lines without struggling to put people online.

Altice Business has deployed Smart Wi-Fi to thousands of customers across 21 states, performing hundreds of installations per month on the behalf of their customers. This is only achievable due to the simple, effective solution and configuration outlined at the onset of the product development process in conjunction with the various stakeholders.

5.1. Benefits for Altice Business Customer

Business owner's with Altice Business services benefit by having a professional, reliable, and yet simple to use solution whether it be the deployment, integration or usage. It allows the business owner to focus on operating and growing their business and not have the headaches managing the technology as well.

Given the multiple touch point businesses have, it becomes a bit overwhelming at times to identify and connect with the various vendors/providers involved with running a business network. Altice Business has solved for that issue here by provide the necessary technology products and services through one single source.

By offering these services through a single source, it is an enhanced overall customer experience and the provider becomes the trusted advisor to the business.

Customers who now frequent the business recognize the ease and reliability of the Wi-Fi and as mentioned earlier, have a tendency to stay longer periods of time, and purchasing more products/services during that extended timeframe, yielding again a much more enhanced customer experience.

5.2. Benefits for Service Providers that Employ Managed Services

TSIA reports that the Managed Services industry, as evidenced here with Altice USA, is growing by leaps and bounds. Below is a graph outlining managed service growth as a percentage of total revue.
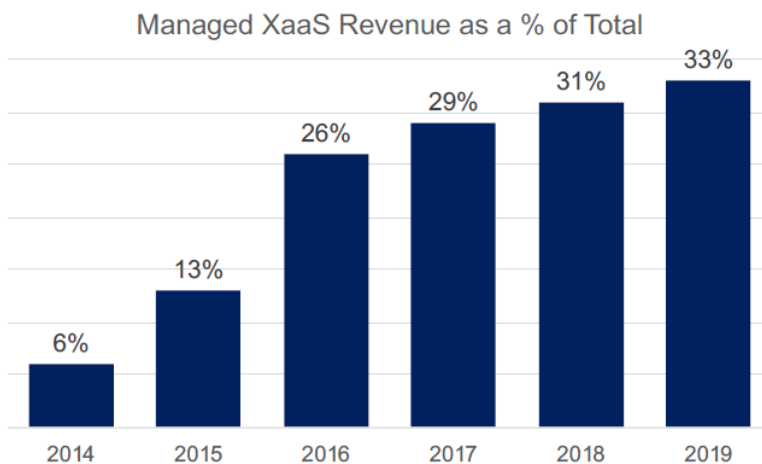
Managed XaaS Revenue as a % of Total

Figure 3 – Managed Services Growth

Manages Services with a customer focused outcome through partnerships have yielded a considerable increase in amount of revenue as a result, including ARPU, attach rates, and customer satisfaction. Additional favorable aspects exhibited are reduced churn, minimizing operational expense, increased rate of provisioning by utilizing flow through automation, and the ability to provide additional value add services such as content filtering, additional wireless security features, and reporting capabilities.

Customization for the business owners is a major aspect of the Altice Business' Smart Wi-Fi offering and one that allows the customer's brand to be front and center in the eyes of Altice USA enterprise clientele. This goes to the customer experience aspect of the journey and has assisted in raising Altice USA NPS scores.

While we tout the benefits of all this wonderful collaboration and technology, it doesn't come without some heavy lifting. Training, planning, coordination and systems integration are just a few of the hurdles that teams have overcome. Luckily, the state of technology through the use of APIs and other integration techniques, helps to overcome these challenges.

In the end, the system may be complex, the integration advanced to be able to provide the suite of products and services, but the business, their customers, and our sales teams all view this as a simple, easy to sell, easy to deploy, reliable solution that enables all involved to stay connected, stay informed, and stay focused on their own tasks at hand.

6. Conclusion

Small and Large businesses alike are demanding more from their service provider partners regarding networking solutions. Service providers that offer the second network as part of their portfolio have an opportunity to provide a valuable service to their customer, increase revenue and prevent damage to their brand out of their control caused by substandard networking solutions deployed behind the first network. Second network managed service solutions enable service providers to offer an end-to-end enhanced network experience to their business customers that is second to none. Furthermore, coupling a reliable

second network offering and very highspeed first network positions the service provider for additional value-added services further increasing their customer value and target addressable market.

Service provides that extend their reach beyond the pipe and into the second network with be rewarded with a loyal customer base that is willing to invest in the value they are receiving from their service provider partner.

Abbreviations

AP	Wi-Fi access point
API	Application Program Interface
ARPU	Average Revenue Per Unit
MDU	Multi-Dwelling unit
NPS	Net Promoter Score
PMO	Program Management Office
SMB	Small to medium Business
TAM	Target addressable Market

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