

Software Defined Access

How software platforms are transforming the business of broadband access

SUMMARY

The broadband access network has evolved from a collection of traditional connection-oriented nodes into a subscriber-centric architecture that stretches from the data center to the consumer's wireless devices. As networking architectures evolve to meet the rapidly evolving needs of Internet-savvy consumers, new networking solutions must emerge to transform the network, operations, and business of broadband access.

Until recently, silicon was the engine of innovation within the access network and new service rollout was gated by the availability of next generation chipsets. Today, innovation is driven by the software platforms that ride on top of the hardware, abstracted from the cable, DSL and fiber physical layer technology.

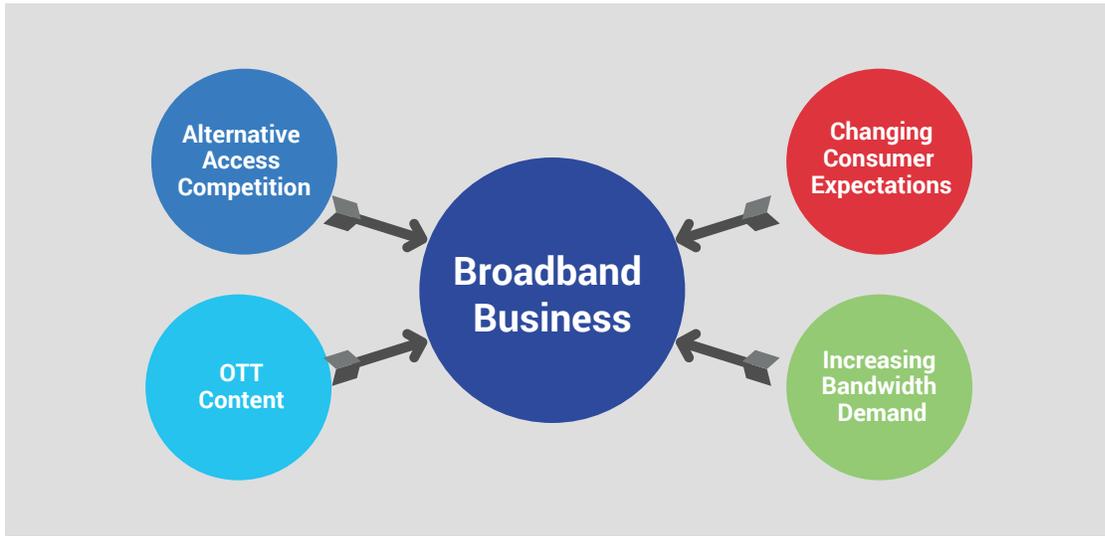
Innovative service providers will thrive in this new era of software platforms that provide the agility of a cloud provider and the efficiencies of a data center while embracing the unique distribution nature of the access network. From content distribution to the IoT-enabled smart home, software platforms are delivering dramatic operational efficiencies, capital cost reductions, and new revenue opportunities.

THE BUSINESS OF BROADBAND

Internet access is increasingly the only network operator-provided service valued by the residential and small business customer, making it challenging for service providers to offer value to their subscribers. When switching costs and differentiation are low, the ability to satisfy and keep paying customers over the long term becomes difficult. Consumers today have a deeper relationship with the media streaming into their homes and the devices that automate their daily habits than the networks that deliver these services. The traditional view of broadband access is dead. To be successful, service providers must leverage software platforms to transform their business, network, and operations to compete for subscribers in ways that are both familiar and alien.



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The business of providing broadband service – collecting a monthly fee to connect a subscriber’s home or business to the Internet over a local distribution network of copper, coax, and fiber lines – is healthy and strong. According to a 2017 report published by the International Telecommunications Union (ITU), global fixed-broadband subscriptions have increased by 9 percent annually in the last five years, aligning with data that shows 830 million young people are online, representing 80 percent of the youth population in 104 countries.

The increasing use of cloud services and streaming video has driven up bandwidth consumption and made the need for fixed broadband access more important than ever before. Unfortunately, increased data consumption driving growth in broadband subscriptions tells only part of the business story for service providers. While broadband subscriptions in the U.S. have grown in the past decade, the voice+video+data triple-play service bundle is in full retreat. According to data from IHS Markit, the number of cable customers subscribing to traditional pay-TV in the US has fallen by 10 million – over 17 percent – in the last decade. Bundled pay-TV service, like traditional voice service before it, has been eroded by Over the Top (OTT) streaming media services, leaving broadband internet access as the dominant component of the service provider revenue engine.

Traditional telco and cable network operators are caught in a ‘speed trap’. Not one where they must slow down to comply with some theoretical broadband speed limit, but one where they must continuously upgrade their networks to provide ever-faster top speed – yet garnering little additional revenue for their efforts. Nielsen’s Law of Internet Bandwidth has been remarkably accurate in predicting a high-end user’s connection speed will grow by 50 percent per year. In the next few years, 1 Gbps for premium user connectivity speed will be common place, putting pressure on service providers to once again upgrade their access networks.

While the traditional view is that telco and cable operators battle for the subscriber’s connection, the real war for the consumer’s wallet is being waged by the OTT application megabrands – Amazon®, Google®, Apple®, Facebook®, and Microsoft®. The megabrands are pushing into the home and small business, providing all manner of entertainment, productivity, IoT smart home, and increasingly, wireless networking products that the consumer is quickly adopting. The consumer has a tightly-bound relationship with their wireless IoT smart home devices and talking speakers. In the minds of most consumers, broadband access is nothing more than the unseen connection that brings life to their beloved collection of devices and media sources.

To succeed in the new business of broadband access, innovative service providers must transform themselves to meet the business objectives of increased service agility, increased operations efficiency, creation of new revenue streams, and the realization of step-function cost reductions. Fortunately, the path to success has been blazed by the megabrand application providers.



SOFTWARE PLATFORMS: THE ENGINE OF INNOVATION

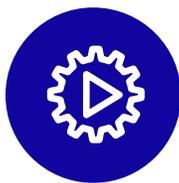
In the past, innovation in the broadband access network came from the silicon chipsets providing the physical layer connection between the central office or cable head end, and the subscriber's home or business. Service providers and systems suppliers waited patiently for the next copper, coax, or fiber technology to provide a competitive advantage. Those days are gone. While the physical layer technology is important, going forward, nearly all transformative innovation will be driven by the software that is abstracted from and rides above the physical layer. Software will define the service, not the physical network.

Each data center, smartphone, online service, and consumer device is being transformed through the power of software platforms that deliver virtualized microservices that can be ported anywhere. Platform enabled continuous development / continuous integration (CD/CI) reduces time to market for new applications while simultaneously nurturing an innovation environment that quickly responds to consumer demand. Software platforms host applications that are fully programmatic and instrumented, delivering operations efficiency across a global scale.

The exciting news for service providers is that this same software platform paradigm applies to the broadband distribution network and the on-premises systems that connect consumers to their online content. As we look across the new subscriber-centric broadband network, we see that software is having profound positive business impacts on operations efficiency, capital cost reductions, and new revenue opportunities.



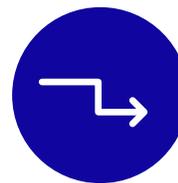
Service
Agility



Operations
Efficiency



New
Revenue



Structural Cost
Reduction

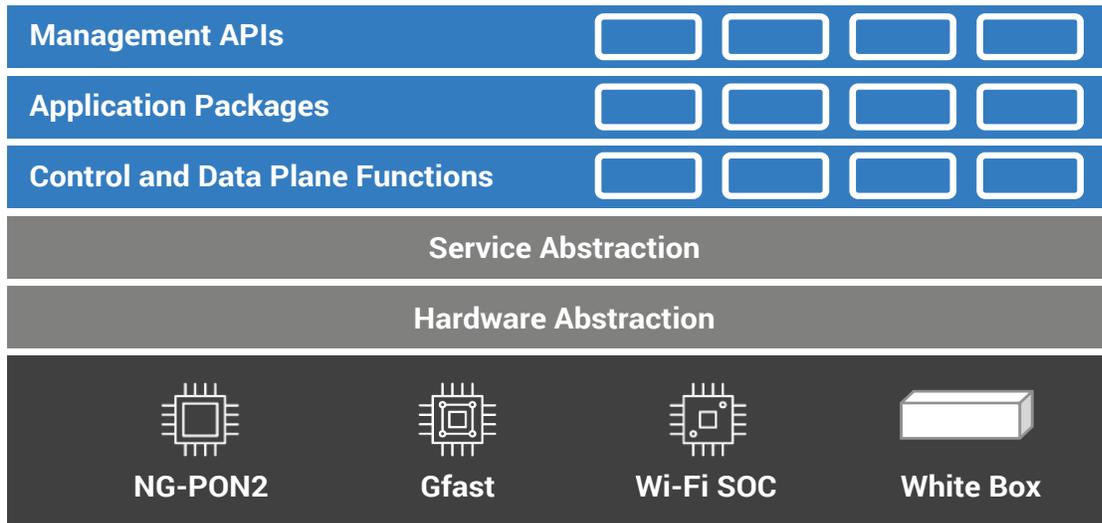
SOFTWARE DEFINED ACCESS

Service providers are extending the benefits of Software Defined Networking (SDN) and network functions virtualization (NFV) into the access network's central office (CO) and cable head end. Software Defined Access (SDA) is an open architecture, built on a foundation of embedded software platforms, for building next generation access networks. The SDA architecture has three core tenets.

Software independent from the infrastructure. SDA is built upon the principle of hardware independence – the idea that software platforms can be separated from the underlying network and subscriber premises equipment to provide a unified access solution over fiber, copper, and wireless infrastructure for residential, small business, and enterprise subscribers. SDA is one network built on common software platforms that is fast, always on, secure, and simple to use.

In the SDA architecture, embedded software platforms power the access infrastructure and subscriber equipment, supporting all the best attributes of cloud and enterprise software platforms. With SDA, the same SDN and NFV concepts that enable improved economics, service velocity, and operations agility in the data center now apply to the access network.

Modular software portable to any application. A Software Defined Access network requires the replacement of monolithic software architectures with modular, extensible, and optimally distributed platforms that speed time to market for new services and physical layer technology, eliminate service disruptions, and reduce operational complexity. In an SDA network, modular control and service network functions must be supported on both the physical and virtual network, whichever is optimal for the service provider.



Within the embedded software platforms, all software components must be modular and independently developed, tested, and operated so that changes to one component do not impact the rest. SDA embedded software platforms draw on technologies from the data center to provide stateful operation, self-audit, and self-restart of each modular component, resulting in the elimination of service outages and routine network maintenance downtime. In the SDA DevOps world, software development and service provider operations teams are working together to shorten software development cycles, improve quality, and align around business objectives.

Network programmability and automation. An SDA network is part of a global, multi-vendor, multi-domain service orchestration and business services ecosystem. Similar to mobile networks with millions of independently managed end point devices, the SDA architecture directly connects access systems to service orchestration systems to provide the greatest simplicity, automation, and global interoperability.

A paradigm shift away from 'system configuration' to 'network programming' is facilitated by open standard APIs and data models, while deep layers of instrumentation extract telemetry and application data for analysis that drives informed business decisions. Rigorous adoption of standards-based interfaces enables system integration with any SDN orchestration system, resulting in standards-based solutions that drive automation and business transformation.

THE FUTURE IS NOW

Software platforms will soon extend data center computing to the very edge of the service provider network, with service provider-owned access network and premises systems the sought-after edge computing resource for a host of new applications. Service provider edge computing will extend the capabilities of low-cost IoT sensors by providing local, low latency compute resources, greatly expanding the market for facial recognition security, healthcare monitoring, and other industrial applications. Distributed embedded system software platforms will provide the framework and managed infrastructure that delivers new revenue opportunities for service providers.

The traditional business of broadband service providers is under stress, but from adversity comes the opportunity to drive business transformation to provide economic vitality far into the future. Innovative service providers will leverage software platforms to increase service agility and operations efficiency while delivering a framework that enables new revenue streams and structural cost reductions. From the perspective of the broadband subscriber, software platforms will deliver the new must-have triple-play service bundle: unlimited broadband from an always-on wireless connection, service flexibility with full-service analytics-driven customer support, and a gateway to an endless supply of experience-delighting applications.