

# Virtual, Agile and In Control

A next-generation global communications  
model for digital business

May 2017

**\*ISG** Insights™



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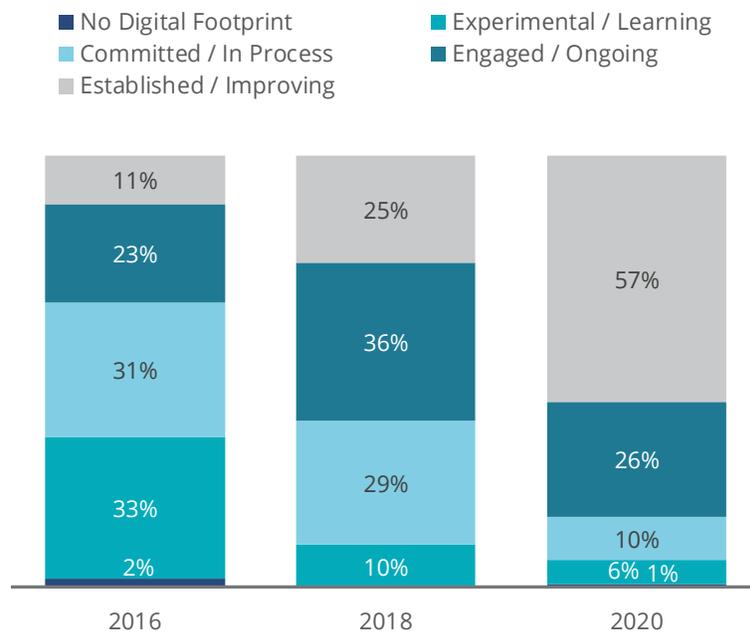
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# Introduction: Competition and Opportunity Require Digital and Global Connectivity

The interconnected, digital business world is a reality for all types and sizes of firms worldwide. Competition is as likely to come from around the world as it is from around the corner. Our work with user enterprises in Europe, Asia, and North America indicates that one-third of firms already see increasing competition from competitors from outside of their traditional markets. Sustained competitiveness requires new ways of doing business in more places, with more people and more things. The usual term for this is “digital transformation.”

And it is all happening quickly. Figure 1 uses data from our most recent global Digital Business survey to illustrate the current pace of transformation. We see that about two thirds of firms in 2016 reported themselves as having either very early digital business footprints, or having digital transformations in process. That shifts in 2018 to almost two thirds of firms having either ongoing digital business efforts or building out and improving established digital initiatives. By year-end 2020, digital is the mainstream business model.

**Fig 1** Digital Business Worldwide, 2016 - 2020



Source: ISG Insights, 2017

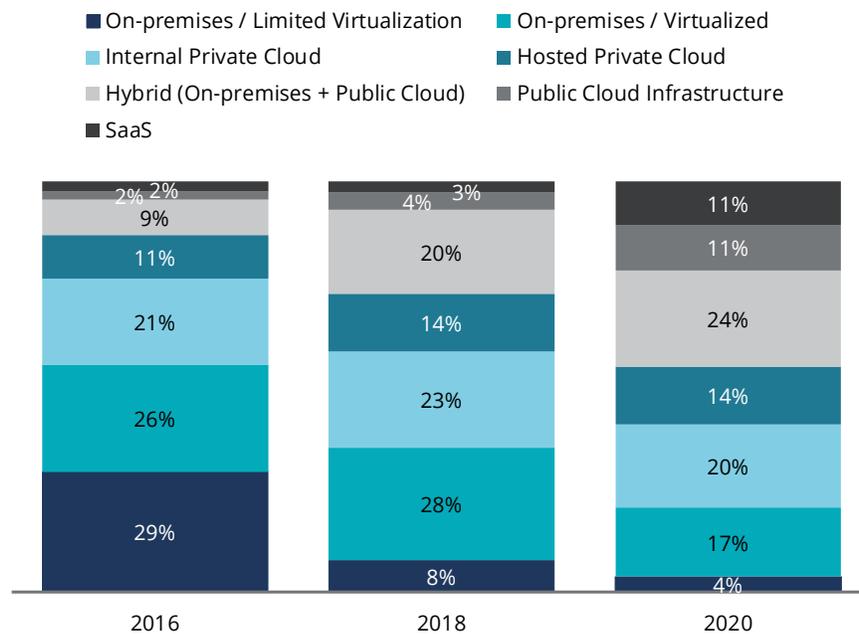
As this happens, more and more core business and business IT will shift to more networks. According to the latest survey data from ISG Insights, even the most traditional business IT workloads (e.g., business management software functionality) are shifting rapidly from on-premises to hybridized combinations of cloud and outsourcing services providers. By year-end 2020, we should see 60 percent of enterprise business workloads off-premises in multiple, remote, cloud-based locations.

As a result of this shift, firms will be using more types of IT infrastructure to host and connect data, software and even operations. Figure 2 indicates how

enterprises expect to use an increasingly varied blend of private and public cloud, software-as-a-service and on-premises IT.

The key to making all of this work is adaptable and affordable connectivity. Digital firms and marketplaces require the ability to connect with more partners, customers, devices, systems, software, places and people on an increasingly unpredictable basis. And we must be able to accomplish this globally and in an agile manner - meaning quickly, accurately, repeatedly and sometimes temporarily - in order to compete. Without such connectivity, business becomes unviable.

**Fig 2** The Increasingly Hybrid Business IT Reality Through 2020



Source: ISG Insights, 2017

## THE REALITIES OF VIRTUAL NETWORKS

The term for connecting multiple data networks over a geographically dispersed area is wide-area network (WAN). WANs may include connections between LANs, between buildings and companies, strike and between cloud services and on-premises systems, and even between telecom providers. Traditionally, WANs have been built using private networks, but it can be time-consuming and quite costly to set them up, use them, and especially to change them in the flexible and adaptive manner that global, digital business requires.

The most effective alternative type of WAN connectivity that we see used in the new digital, global business world is built with virtual private networking (VPN) technologies. A VPN uses software to create secure connections to share data using a variety of private and public networking technologies, including the Internet. It works similarly to a dedicated private network but is much less costly, and the connections can be temporary or long-lasting, depending on the need. Among our client enterprises, we tend to see four VPN approaches in use. Each has advantages and disadvantages, depending on how and where it is used. The four VPN approaches are briefly profiled to the right and below.

### APPROACH 1: MPLS VPNS

Multiprotocol Label Switching (MPLS) is a type of data-carrying technique for high-performance telecommunications networks, and is used as a flexible means of transporting and routing different types of network traffic via VPN. MPLS directs data from one network node to the next efficiently and quickly. MPLS advantages include reliability and quality of service (QoS) compared to many other WAN approaches. Enterprises (or their telecom carriers) can layer Internet connectivity on top of it to increase reach and interconnectivity. And MPLS typically offers what is called “low network latency.” Low latency means faster network response, which improves the ability to use cloud-based IT infrastructure and software as a service.

MPLS networking can be complex, which often leads to limited flexibility and costly adaptability, especially in situations where companies must link systems using complicated or older technologies. So while MPLS VPNs work well, they may not support the agile capabilities that businesses need to grow, adapt and compete in today's markets. Global providers that we see most often in this space include AT&T, BT, Verizon, OBS, Deutsche Telekom and NTT Communications; most national telecom carriers also offer types of MPLS VPN services.

### APPROACH 2: INTERNET VPNS

One of the more commonly used VPN approaches is routing VPN traffic using the public Internet backbone. We see this used most often to provide temporary, secure remote or mobile access from a user device or from a branch office to company systems. This connectivity is obviously less expensive than a private network and can be used in most areas of the world.

However, with Internet VPN there is no service level agreement (SLA) to ensure connectivity, reliability and responsibility for the network and no network management and control. And while Internet performance has improved in many places worldwide, rapid growth in its daily usage brings more problems. Network interruptions, unpredictable network latency and lost data are still common, especially when using Internet VPNs to link multiple, dispersed sites. This is partly because the routing of the data traffic is unpredictable. Internet routing is done according to telecom service provider needs, which may not match your business connectivity requirements. For example, data traffic may be shifted to other providers' networks, which may not provide the simplest and most secure path. Providers of Internet VPN connectivity include NordVPN, NTT Virtela and most national and international telecom carriers.

## APPROACH 3: SD WAN

More and more telecom providers are deploying a very powerful and adaptable approach called software-defined networking (SDN). SDN uses a series of data networking protocols, tools, interfaces and controls to enable more intelligent, programmable and flexible networking. Deployed over a WAN, an SDN becomes an SD WAN. An SD WAN can be readily and quickly configured, automated and managed using a provider's centralized, adaptable software platforms - usually cloud-based. SD WAN enables rapid network provisioning, and agile adaptability of network capabilities, at much lower costs than traditional network management approaches. And because they can be remotely customized and reconfigured via cloud, global network updates and security management can be delivered automatically.

SD WANs may run on top of MPLS networks via Internet, using wireless/mobile networks, or in hybrid approaches that blend these methods of transporting data. We frequently see two variations on this approach - the "do it yourself" and the "managed services" approaches, as follows:

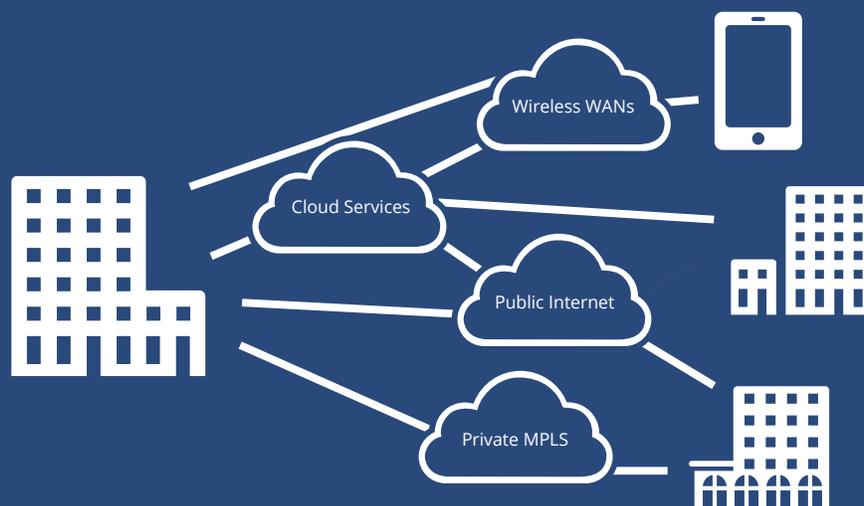
### Do It Yourself Services and Technology

In the "do it yourself," technology-focused version, a business acquires the needed services from one or more telecom providers and manages them in-house, using owned or leased software and hardware. This can deliver very customized SD WAN capabilities. We see this approach mostly among larger firms that have significant in-house networking and telecom skills and management capabilities. Technology providers in this space include VeloCloud, Viptela, Versa Technology and Aerohive.

### Managed Services and Technology

The second approach relies on managed services from one or more telecom providers to integrate and manage the SD WAN, either on top of an MPLS network or using the Internet for transport. These managed services cost more than straight SD WAN services, but they also reduce or eliminate the need for in-house networking knowledge and management skills. Providers that we see in this space include Verizon, BT, Interoute, Aryaka, NTT Communications and AT&T.

Fig 3 SD WANs Virtually Link Places, Networks and Systems



## APPROACH 4: NEXT-GENERATION APPROACHES

Building on the capabilities of today's SD WANs, next-generation approaches add greater technology and business model innovations to provide substantially-improved, end-to-end coordinated and centrally managed services beyond what is commonly used today. Such approaches combine an integrative hybrid network leveraging the public Internet with point-to-point Ethernet links – but avoid the complexity of traditional MPLS networks, while providing end-to-end automation and management. We also see innovative business models based on an economy of sharing that combine network assets of local carriers with the global reach of international providers, while ensuring local care for business customers at the same time. The ability to establish, develop, expand or even reduce enterprise presence where and when it is needed with the best available technical and service capabilities is core to 21st-century, digital business competitive reality. Several forward-thinking telecom carriers are working on this type of approach - but we believe it will require a new and different type of business model to succeed.

## CRITICAL CAPABILITIES

Obviously there is more to global interconnectivity than the provider approach and technology foundation. The capabilities of carriers and of the services they provide are key to their ability to satisfy enterprise needs. In our experience, the greatest value is delivered by carriers combining hybridized and readily adaptable network services through a centralized, coordinated model that enables end-to-end automation and management through a strong set of partner alliances. We usually present this to our enterprise clients as follows:

**1. Integrative hybrid networking.** A hybrid network is any computer network that uses more than one type of connecting technology or topology. A typical business example is one in which a company uses dedicated Ethernet as its primary network access for critical data traffic, and public internet for less critical traffic like web-surfing. The most obvious advantage to the user enterprise is the ability to use the most effective and efficient network technology(ies) as needed. A potential disadvantage is the need to integrate, manage, update and secure multiple technologies as a service. The best approaches use cloud-based software and hardware platforms to automatically integrate multiple network types into the most advantageous hybrid mix.

**2. Global reach, local care.** In an increasingly global digital reality, business networks must be able to reach any marketplace where companies need to do business, whether permanently or occasionally. So not only is global reach important, but so is the ability to quickly and readily stand up or pull down local connectivity as needed. This requires local support, including technical and regulatory knowledge and guidance - wherever the enterprise needs to do business. This is something that has been beyond the traditional telecom carrier "handshake and hand-off" approaches, in which they simply transfer network traffic to another carrier. In such environments, carrier responsibility and support for customers, data and connections are very limited.

**3. End-to-end automation and management.** End-to-end automation enables not only quick, accurate and easy configuration of network capabilities for different market requirements and technology requirements. It also enables accurate, ongoing improvement and enhancement of network services and management immediately, and at relatively low costs compared to traditional approaches. End-to-end capabilities also enable constantly-improving network-wide security, reliability and regulatory compliance. This offers fewer problems, less complexity, lower costs and more flexibility for enterprises.

**4. Central orchestration.** When dealing with multiple markets and multiple networks, it is a huge advantage to have a centralized means of coordinating and making everything happen. While no single provider can deliver all services in all markets, it is possible - and desirable - to have a centralized authority with the responsibility and capability of orchestrating and managing all services. The optimal approach is to do so in an automated manner, with a permanent, global, end-to-end view and a centralized inventory for all configured services under operation. We see providers like ngena developing platforms that enable this across multiple carrier partners' networks. Without such capability, when data is lost or connectivity is interrupted, valuable time and other resources will be spent searching for the problem, finding its cause and resolving it. This is a potential huge timesaver for enterprises, especially those that need to alter network connectivity from time to time (e.g., opening or shifting offices; linking to suppliers or customers; upgrading services).

**5. Shared business model with strong partners.**

All carriers engage in interconnected networks and capabilities; it is an important part of their business. But in many carrier approaches to SD WAN, competition and cost prevent the most effective delivery of the best capabilities to customers. Interconnected agreements between carriers are often developed through competitive necessity over time. This results in the "handshake and handoff" term used earlier - in this case meaning the carriers simply agree to carry each other's traffic for a specific charge, without sharing customer or business responsibility.

A better model is a shared business or "alliance" model built with and by multiple carriers with the goal of sharing development, support, responsibility, cost and revenue. Such an approach creates more shared opportunity for the carriers, which in turn translates to improved willingness and ability to serve and support customers.

## COMPARING MODELS

When determining the right path to follow, it is helpful to lay out and compare alternative approaches against critical requirements. Combining the above capabilities with the previous outline of WAN service approaches, and illustrating the relative cost for each, helps visualize the relative strengths of each approach. The matrix shown in Figure 4 illustrates this.

Fig 4 VPN Approaches vs. Capabilities

● Low      ● Medium      ● High

Commonly-seen VPN Approaches	Critical Provider Capabilities					
	Integrative Hybrid Networks	Global reach with local care	End-to-end automation and management	Central orchestration	Shared business model with strong partners	Relative Cost
MPLS	●	●	●	●	●	●
Internet VPN	●	●	●	●	●	●
SD WAN – DIY Services and Technology	●	●	●	●	●	●
SD WAN – Managed Services and Technology	●	●	●	●	●	●
Next-Generation Approach	●	●	●	●	●	●

Source: ISG Insights, 2017

It is important to note that this matrix does not gauge the relative importance of each capability to every customer enterprise. For example: a company may not believe it requires more advanced network orchestration or automation capabilities, and therefore may be completely satisfied with the strict cost savings enabled by an Internet VPN approach. Or an enterprise with substantial in-house telecom and data networking resources may pursue the DIY approach and not feel it needs third-party global care, automation and central orchestration/coordination of services and technologies.

## CONCLUSION AND WHAT TO LOOK FOR

The new global, digital business reality presents unique business connectivity challenges. We must have a sometimes-unpredictable variety of communications capabilities to transform a changing set of technologies into telecom services that are stable yet agile, reliable yet variable, and cost-effective yet complex. For most enterprises, this means at least some version of SD WAN capability, whether built on MPLS, utilizing Internet VPN technology, or most likely, a hybrid approach that is likely to shift over time.

We also know that no single telecom carrier can adequately meet all of these end-to-end connectivity needs and deliver the best possible support and costs, as traditional carrier network and business models cannot support such variable customer needs while delivering the revenue that carriers require.

This is an application of the next-generation approach described earlier, using cloud-based platforms that integrate and manage the needed capabilities for carriers to deliver as telecom services. A well-thought-out platform will include at least the following:

- Seamless interconnectivity and integration across multiple local, national and international carrier networks to provide the global reach and local connectivity required
- Adaptable, automated provisioning that enables fast setup and delivery of a potentially changing mix of connectivity as needed, where needed and when needed
- Security capabilities that comply with current regulatory requirements in multiple nations and situations - and which adapt to regulatory changes as they occur
- Advanced automation that facilitates ongoing network, security and compliance upgrading as well as the provisioning and compliance noted above

But as noted earlier, technological capabilities alone - in this case, a complex cloud platform - are not enough. To avoid the problems of the past, a next-generation business model for telecom carriers is also required. In our view, such a business model should be a "gain-sharing" partnership model that enables carrier partners to mutually benefit in the following ways:

- (a)** sharing some ownership of the platform;
- (b)** sharing costs of platform development, upgrades and operation;
- (c)** sharing some relative portions of revenue generated through the partnership.

This not only makes it more likely the partner carriers will work better together. It also frees them from the direct responsibility and high cost of developing and maintaining their own platforms. The co-ownership, shared costs and shared revenue of the gain-share model allow the partner carriers to invest more capital in improving their own networks and customer support - a critical need in the global-reach-local-presence aspect of digital markets.

We are seeing many telecom carriers investigating the next-generation cloud-based management platform approach, and several have developed or are developing some of the advanced automation and management capabilities required to enable the full range of global, SD WAN capabilities.

But we do not yet see many carriers pursuing the gain-share partnership business model. It is a very new and different way of thinking for telecom carriers, and will take time to be tested and accepted. In the meanwhile, those carriers engaging in next-generation platform approaches within a gain-share-style business model will be the ones that create the best opportunity for customers, and for themselves. We advise our enterprise clients seeking global+local connectivity for digital business to look for those carriers; they will be the best positioned to deliver the optimal mix of services, reach, reliability and cost.



## SPONSOR PERSPECTIVE

### ngena - The Shared Network

ngena comes with a completely new business model and new SDN-enabled technology in a greenfield setting, sharing network assets of trusted service providers. With ngena, the alliance partners pave the way for a truly globalized economy.

#### Connectivity for a globalized economy

The number and reach of global enterprises is rising continuously and they demand comprehensive and worldwide reliable connectivity. Telecommunications service providers around the world are facing the difficult task of meeting the constantly growing needs of such clients with their current offerings.

To address this challenge, leading international telecommunications service providers have joined ngena, an alliance based on the principle of sharing network assets between partners globally. ngena's solution combines an innovative business model with a state-of-the-art service delivery platform based on Software Defined Networks (SDN), Network Function Virtualization (NFV), service orchestration and process automation. The ngena VPN service offering also includes a broad variety of additional value-added-services. ngena's approach is revolutionary and based on a global service catalogue as well as end-to-end automated service deployment and assurance, and will shake up today's VPN service delivery methods, which are based on legacy networks that involve extensive manual processes.

The alliance approach allows ngena members to provide global hybrid VPN services to their multinational customers, i.e. a SD-WAN++ that is Internet-based and also provides Ethernet point-to-point connections. These services are highly standardized and uniform among all ngena members, thus ensuring a consistent service experience across the global platform. ngena aims to provide a global business network that is innovative, highly standardized, quicker and easier to deploy, of the highest security standards, more stable and less complex than any other solution available on the market.

#### About ngena

ngena (the Next Generation Enterprise Network Alliance) is a start-up company that provides a global business network via a unique service platform. A global alliance formed by leading international telecommunications service providers, ngena is based on a shared network approach. Altice, Century Link, Deutsche Telekom, Neutrona, PCCWGlobal, Reliance Jio, SK Telecom, Telstra, and more than ten other telecommunications service providers have already expressed their commitment to work together on the development of ngena. More about ngena and their alliance partners can be found at <http://www.ngena.net/>.

"Digitalisation is global, it does not stop at national borders. Business customers are requesting global networking that is flexible, and which has a high capillarity and capacity. Nevertheless, they need to be secure as well. And of course, customers need these services in every location, wherever they are, around the world. Therefore, we have founded an alliance to provide this kind of global networking. We call it the next generation of enterprise networks: **ngena**."

- **Dr. Marcus Hacke, Founder and Managing Director of ngena.**

# Author



## Bruce Guptill

Executive Director & Principal Analyst, ISG Research

In addition to coordinating and managing ISG Insights' overall research agenda and production, SVP and Head of Research Bruce Guptill's research and expertise focus on the changing business of IT software and services. His work for enterprise clients includes IT value and cost modeling, and business planning for new types of IT that enable new business value. His enterprise-side research and consulting work translates the changing business value of enterprise IT into improving business strategies and go-to-market models for IT providers, especially in software and services.

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May 2017

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