Technology Assessment

Cloud and Drive for WAN Efficiencies Power Move to SD-WAN

Brad Casemore   Rohit Mehra

Nav Chander

IDC OPINION

The requirements associated with cloud computing have already reverberated through datacenter networking, with software-defined networking (SDN) arising as an architectural approach that provides the network with the agility and responsiveness that it lacked previously. Now, the focus is turning to how the WAN can be optimized to accommodate the requirements of cloud applications and services. The emergence of SD-WAN is a relatively recent market development, preceded by the existence of hybrid WAN architectures. A typical hybrid WAN includes at least two WAN connections from each branch office, leveraging two or more different access technologies (MPLS, broadband Internet, 3G/4G, and others). SD-WAN leverages hybrid WANs, but it includes a centralized, application-based policy controller; analytics for application and network visibility; a software overlay that abstracts underlying networks; and an optional SD-WAN forwarder (routing capability) that together provides intelligent path selection across WAN links. SD-WAN business benefits include cost-effective delivery of business applications, meeting the evolving operational requirements of the modern branch/remote site, optimizing SaaS and cloud-based services, and improving branch IT efficiency through automation. This document provides a worldwide market forecast for SD-WAN products and services through 2020. Among the key findings are:

- SD-WAN has emerged as a significant architectural response to the need for increased WAN efficiencies in the enterprise and for optimizing user experience across a plethora of public and private cloud applications (SaaS, UC&C, etc.).

- The worldwide SD-WAN market for infrastructure and services will exceed $6 billion in 2020. For the 2015–2020 period, IDC estimates that the compound annual growth rate (CAGR) for SD-WAN will be over 90%. As with existing WAN deployment models, SD-WAN technology rollouts will largely be orchestrated via enterprise networking vendors, integrators, and communications service providers (CSPs).

- From a segmentation standpoint, IDC sees four categories of products and services that form this emerging SD-WAN market landscape: WAN infrastructure (routing and WAN optimization), SD-WAN control and overlay (SD-WAN application-based policy controllers and overlays and related analytics), CSP SD-WAN managed services, and cloud-managed SD-WAN services, which can be provided by SD-WAN vendors, OTT cloud service providers, or managed service providers (MSPs).

- SD-WAN's growth will affect other WAN-related markets, including branch routing and WAN optimization. The latter will be especially impacted, with WAN optimization ultimately becoming a subset or secondary market to SD-WAN. IDC sees SD-WAN playing into the broader software-defined enterprise branch opportunity (e.g., cloud-managed CPE), in the longer term.

IN THIS STUDY

In this Technology Assessment for SD-WAN, IDC evaluates the market potential of SD-WAN solutions, including products (hardware/software) and services (CSP, MSP, and cloud managed). All revenue projections are for in-use SD-WAN offerings.

This study includes:

- Technology and market status
- Business drivers for SD-WAN
- Market and technology segmentation
- Forecast for SD-WAN products and services

Note: All numbers in this document may not be exact due to rounding.

SITUATION OVERVIEW

The 3rd Platform has become an undeniable technological foundation for business process improvement and also for improved business outcomes. Cloud and mobility have been key pillars of the 3rd Platform and have generated opportunity as well as disruption across a number of well-established enterprise IT infrastructure markets.

Although much discussion has ensued regarding the datacenter implications of virtualization and cloud, the consequences for the WAN also are hugely significant. As public and private cloud continue to grow, WAN performance becomes critical for latency-sensitive workloads and inter-datacenter business continuity. Accordingly, as enterprises plan and implement comprehensive cloud strategies, WAN architectures need to be considered alongside, and in conjunction with, datacenter infrastructure.

Moreover, as enterprises move mission-critical (e.g., ERP/CRM and UC&C) workloads and business processes to the cloud, there is a greater need to fully integrate cloud-sourced services into WAN environments to ensure workload/application performance, availability, and security. Unfortunately, enterprises might lack awareness of, or visibility into, WAN public cloud usage. Therefore, enterprise IT organizations need to analyze the volume and nature of incoming and outgoing traffic flows to determine whether new network architectures are warranted to improve application performance and to provide end-user access to cloud-based SaaS offerings such as Microsoft Office 365 and salesforce.com.

"Software Defined" Reaches the WAN

The requirements associated with cloud computing have already reverberated through datacenter networking, with SDN arising as an architectural approach that provides the network with the agility and responsiveness – through automated provisioning, programmatic management, and integration with cloud orchestration platforms – that it lacked previously. Now, the focus is turning to how the WAN must be modified to accommodate the dynamic requirements of hybrid cloud computing. In fact, the WAN is an increasingly critical foundational element in the realization of hybrid cloud for enterprises worldwide.

Enterprises adopting hybrid cloud must give careful consideration to a WAN strategy that offers the same sort of operational efficiencies and business agility that they seek to derive from SDN in the

enterprise datacenter and the campus. Indeed, SD-WAN provides the complementary capstone for hybrid cloud application delivery.

Without question, the WAN is critical to the success of enterprise hybrid cloud strategies and initiatives. Although WAN optimization and traditional WAN services have addressed a broad range of client/server requirements, new capabilities are required for 3rd Platform applications and cloud computing — hence the rise of the software-defined WAN, which leverages the principles of software-defined networking and adapts them to the needs of enterprise IT, seeking to optimize application delivery for the enterprise branch.

Defining SD-WAN and Considering Business Drivers

SD-WAN as an architecture is a relatively recent development, preceded by the existence of hybrid WANs. A hybrid WAN includes at least two WAN connections from each branch office, leveraging two or more different access technologies (MPLS, broadband Internet, 3G/4G, and others). SD-WAN leverages hybrid WANs, but it includes a centralized, application-based policy controller; analytics for application and network visibility; a software overlay that abstracts underlying networks; and an optional SD-WAN forwarder (routing capability) that together provides intelligent path selection across WAN links, based on the application policies defined on the controller.

SD-WAN business benefits can include cost-effective delivery of business applications, meeting the evolving requirements of the modern branch/remote site, accommodating SaaS and cloud-based services, and improving branch IT efficiency through automation.
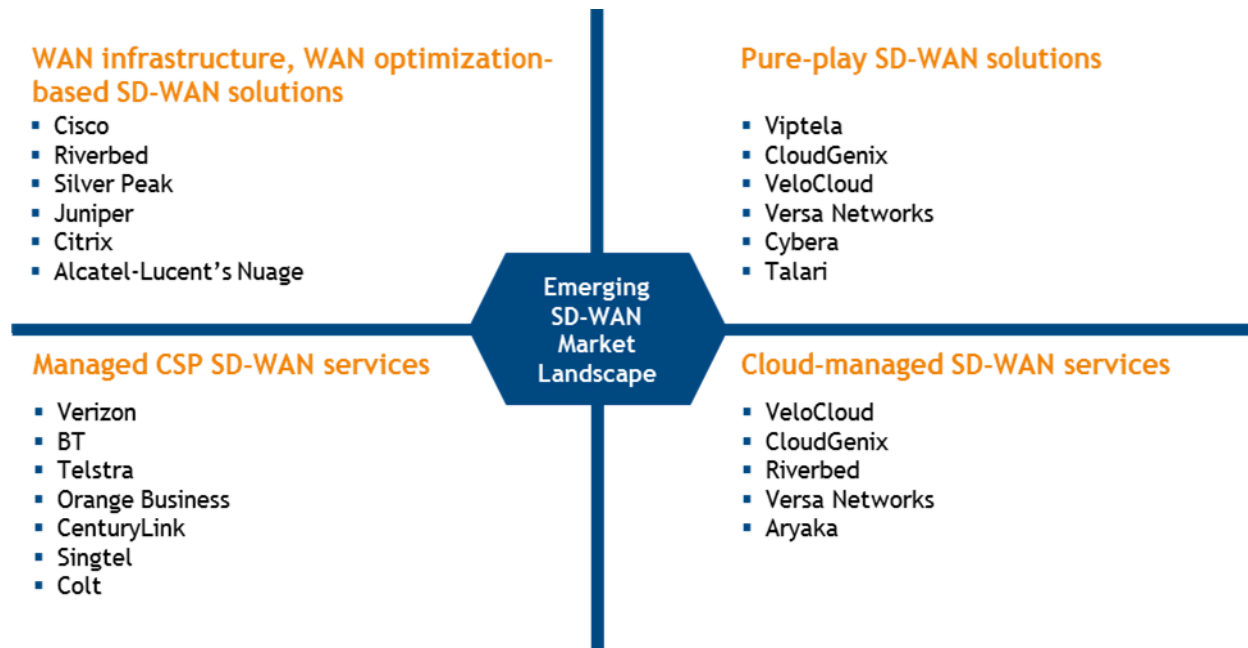
Indeed, SD-WAN started gaining mindshare in 2015, and IDC predicts SD-WAN revenue will ramp up strongly in 2016 across a range of vertical markets. IDC believes that SD-WAN's value proposition — predicated on the growth of cloud computing, the need for simplified VPN capabilities, and the business imperative of reducing MPLS costs — will be compelling for a growing number of enterprise customers seeking to provide cost-effective cloud-era networking to branch offices and remote sites.

Technology vendors and service providers are addressing burgeoning enterprise demand, and competition among vendors is fierce. Current SD-WAN vendors include venture-financed start-ups such as VeloCloud, Viptela, CloudGenix, Cybera, Versa, and Talari; leading router vendors, including Cisco Systems and Alcatel-Lucent's Nuage (now owned by Nokia); and established players in WAN optimization, including market leader Riverbed Technology, as well as Silver Peak and Citrix (see Figure 1).

Meanwhile, sensing evolving customer WAN needs and the potential competitive threat from vendors going directly to the enterprise, major CSPs continue to introduce SD-WAN services. Some CSPs will see SD-WAN as a complement to their existing MPLS businesses, while others will perceive it as a threat, but increasingly, they will have to respond to increased enterprise demand.

FIGURE 1

Emerging SD-WAN Market Landscape

WAN infrastructure, WAN optimization-based SD-WAN solutions
- Cisco
- Riverbed
- Silver Peak
- Juniper
- Citrix
- Alcatel-Lucent's Nuage

Pure-play SD-WAN solutions
- Viptela
- CloudGenix
- VeloCloud
- Versa Networks
- Cybera
- Talari

Emerging SD-WAN Market Landscape

Managed CSP SD-WAN services
- Verizon
- BT
- Telstra
- Orange Business
- CenturyLink
- Singtel
- Colt

Cloud-managed SD-WAN services
- VeloCloud
- CloudGenix
- Riverbed
- Versa Networks
- Aryaka

Source: IDC, 2016

In 2015, IDC noted the emergence of SD-WAN managed services offered by CSPs to enterprise customers. Verizon Enterprise Solutions and BT Global Services were two of the first CSPs to begin to offer this as a managed service, primarily as an overlay to extend their existing managed VPN footprint. IDC expects that in 2016 and 2017, an additional 15–20 CSPs will launch and position SD-WAN services as a complementary managed service offering to traditional network-based MPLS VPNs or router-based IPsec VPNs for cost savings, increased agility, and simplification. Cable MSOs such as Comcast Business and Charter, in the United States, for example, are also likely to offer a managed SD-WAN as an alternative to offering an MPLS VPN, offering IPsec-based VPNs along with WAN optimization to enterprise customers that may already be their Ethernet service customers.

What remains to be seen, however, is how enterprises will want to consume SD-WAN. The preferences could differ across geographic and vertical markets. Some enterprise customers will want to obtain SD-WAN as a service from their favored CSPs or MSPs, whereas others will opt to obtain SD-WAN offerings from technology vendors and deploy them via a DIY approach. Alternatively, some SD-WAN solutions will be offered as a cloud-based service, with cloud-based management, either by vendors themselves or via MSPs/CSPs.

Many enterprises are likely to consult with trusted partners before choosing an approach to SD-WAN that is best suited to their needs. Before making their selection, these enterprises will want to fully understand the pros and cons, and the operational and technological implications, of each option.

Regardless, as enterprises plan and implement comprehensive cloud strategies, it is clear that SD-WAN has emerged as a prominent consideration. IDC believes that, in 2016, a growing number of

enterprises are prepared to consider SD-WAN alternatives and will be prepared to purchase services or solutions from vendors in the next one to two years. Recent data from IDC's 2016 *U.S. Enterprise Communications Survey* is shown in Figure 2. It confirms that 17% of enterprises plan to migrate to SD-WAN in the next year, and 29% plan to do the same in one to two years.

FIGURE 2

Migration Plans to SD-WAN

Q.   Does your company plan to migrate any of your existing WAN/network connections to an SD-WAN alternative?
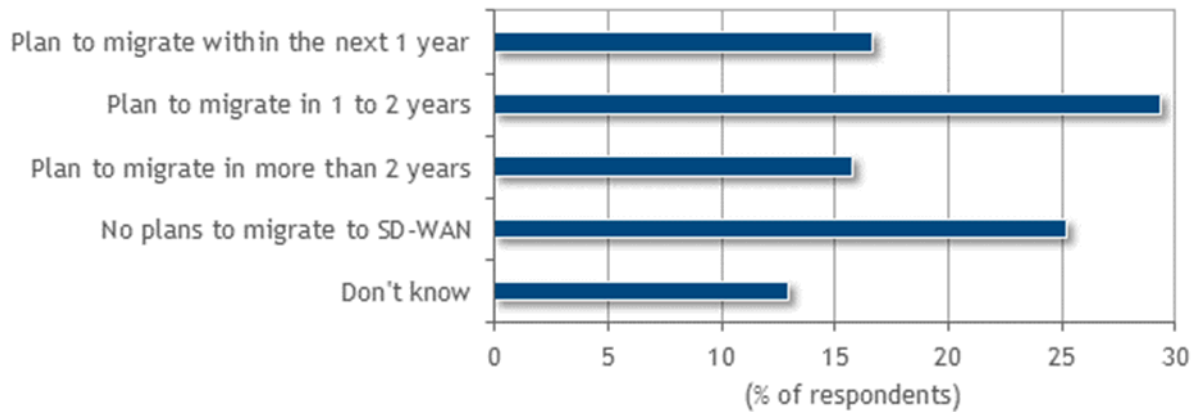
Base = all respondents

n = 1,204

Notes:

This survey was managed by IDC's Quantitative Research Group.

Data is not weighted.

Use caution when interpreting small sample sizes.

Source: IDC's *U.S. Enterprise Communications Survey,* January 2016

Additional IDC survey data suggests that enterprises are just as likely to purchase SD-WAN solutions from established networking vendors or from new SD-WAN vendors as from CSPs.

FUTURE OUTLOOK

IDC forecasts that the SD-WAN market will expand robustly throughout the 2016–2020 forecast period.

In 2015, the relatively nascent SD-WAN market was worth almost $225 million. IDC forecasts that the market will grow 165% to reach about $595 million in 2016 and then will expand 129% to reach nearly $1.4 billion in 2017. It will then grow another 87% in 2018 to reach more than $2.6 billion. For the forecast period through 2020, IDC estimates that the CAGR for SD-WAN will be 93%. The SD-WAN market will be worth more than $6 billion in 2020 (see Table 1).

TABLE 1

Worldwide SD-WAN Revenue by Segment, 2015-2020 ($M)

	2015	2016	2017	2018	2019	2020	2015–2020 CAGR (%)
WAN infrastructure	157.1	321.3	537.2	807.4	1,135.1	1,517.8	57.4
Growth (%)	NA	104.5	67.2	50.3	40.6	33.7	
Share (%)	69.9	54.0	39.5	31.7	27.2	25.2	
SD-WAN control and overlay	57.8	202.5	455.5	797.2	1,235.6	1,668.1	95.9
Growth (%)	NA	250.0	125.0	75.0	55.0	35.0	
Share (%)	25.8	34.0	33.5	31.3	29.7	27.7	
CSP SD-WAN managed services	7.5	48.1	264.8	701.6	1,368.1	2,216.3	211.8
Growth (%)	NA	540.0	450.0	165.0	95.0	62.0	
Share (%)	3.4	8.1	19.5	27.5	32.8	36.8	
Cloud-managed SD-WAN services	2.3	23.6	104.0	244.4	427.8	620.3	207.6
Growth (%)	NA	950.0	340.0	135.0	75.0	45.0	
Share (%)	1.0	4.0	7.6	9.6	10.3	10.3	
Total	224.7	595.5	1,361.5	2,550.6	4,166.6	6,022.6	93.0
Growth (%)	NA	165.0	128.6	87.3	63.4	44.5	

Source: IDC, 2016

SD-WAN's growth will affect other WAN-related markets, including branch routing and WAN optimization. Although IDC knows that SD-WAN offerings are sold primarily as complete offerings – comprising policy-based controllers, analytics for application and network visibility, a software overlay that abstracts underlying networks, and an SD-WAN forwarder (routing capability) – IDC has segmented the market to reflect the functional elements involved. This is intended not only to help understand the specifics of SD-WAN as an addressable market but also to help discern the implications for existing WAN markets, such as routing and WAN optimization. It is also important to understand that IDC's SD-WAN forecast is for in-use products and services.

From a segmentation standpoint, the SD-WAN market broadly encompasses four categories of products, technologies, and services: WAN infrastructure (routers/routing and WAN optimization), SD-WAN control and overlay (SD-WAN application-based policy controllers and overlays and related

analytics), CSP SD-WAN managed services, and cloud-managed SD-WAN services, which can be provided by SD-WAN vendors, OTT cloud service providers, or MSPs.

Specific to the CSP segment of the SD-WAN forecast, a CSP's SD-WAN managed service consists of the following elements:

- CSP management of branch sites including device (CPE) router/switch management
- SD-WAN visibility and reporting
  - CoS or quality-of-experience visibility
  - Application and end-user visibility
  - MPLS performance
  - Router failure detection
- VPN management and policy management
- Analytics

IDC excludes the following SD-WAN elements from the managed services forecast:

- Hardware or virtual CPE devices including routing software
- Virtualization layer or SD-WAN control software
- Access or transport service (T1/E1, Ethernet, broadband, 4G, or MPLS)

IDC used these categories as a means of sizing the market and understanding its implications for existing WAN markets – particularly WAN optimization, but also the branch router market – though it is understood that SD-WAN solutions are most often delivered in whole rather than piecemeal. In this respect, SD-WAN is likely to evolve differently from the SDN market in the datacenter, where network virtualization overlays frequently are provided by one vendor, network underlays (switches) by another vendor, and SDN applications (such as higher-layer network and security services) by yet other vendors.

Looking at the IDC forecast, we can see that the market for SD-WAN growth will occur across product and technology categories (WAN infrastructure and SD-WAN control and overlay) as well as in SD-WAN service categories (CSP SD-WAN managed services and cloud-managed services). Nonetheless, the service categories – with CSP SD-WAN managed services predominating – are expected to lead the growth parade, with CSP SD-WAN managed services growing at a CAGR of nearly 212% through the forecast period to 2020 and cloud-managed SD-WAN services growing at a similar CAGR of nearly 208%. Of course, most of that CAGR will be driven by meteoric growth in the early years of the forecast period (refer back to Table 1).

Although the growth rates for CSP SD-WAN managed services and cloud-managed SD-WAN services will be similar, CSP SD-WAN managed services will account for a significantly large share of the overall SD-WAN market throughout the forecast period (refer back to Table 1). This is attributed to the fact that some of the MPLS VPN managed services and IPsec VPN services will be replaced by SD-WAN services and that the overall VPN and WAN connectivity market will expand in the later years of the forecast period, especially in 2019 and 2020, as enterprise cloud connectivity becomes a key part of a managed SD-WAN service.

The product segments of WAN infrastructure and SD-WAN control and overlay – often sold together, especially by SD-WAN start-ups – will also grow robustly, but at a lesser rate than SD-WAN services.

In some cases, however, the SD-WAN control and overlay technologies will be sold into enterprise and service provider accounts that already have routers deployed, and this accounts for the disparity in growth – and, to a lesser extent, in share – between WAN infrastructure (routing, WAN optimization, etc.) and the SD-WAN control and overlay components.

ESSENTIAL GUIDANCE

Guidance for Vendors

Router and WAN optimization vendors yet to enter the SD-WAN market cannot afford to be passive observers. As previously noted in this study, the SD-WAN market will significantly cannibalize the WAN optimization and, to a lesser extent, the branch router market during the next several years. It's essential for vendors in those markets to extend their product portfolios, organically or through acquisition, to compete in the SD-WAN space.

Vendors, especially start-ups, already active in the SD-WAN market should clearly communicate the business value as well as the technical attributes of their offerings while providing options for greenfield and brownfield deployments. Within this context, vendors should seek to differentiate competitively in areas such as application policy profiling, intelligent path selection, and QoS for real-time applications.

Vendors might also be able to differentiate on the basis of platform strategies. In this regard, vendors could transform their SD-WAN product offerings into programmable platforms, replete with APIs, on which other vendors of network and security services (WAN optimization, firewalls, IPAM, etc.) could port their offerings. Those vendors with the strongest platforms and the most robust partner ecosystem will likely be well positioned for market success.

CSPs and MSPs offering SD-WAN services must give considerable thought to the strategic positioning of those services. SD-WAN service providers will not just be competing against one another, but they'll also be competing against vendors offering SD-WAN products and services. In some cases, those same vendors will be the technology partners of the CSPs providing SD-WAN services. As such, CSPs and MSPs providing SD-WAN services will have to strongly differentiate their services and establish a clear mandate to play in the market. Many enterprise customers, especially those based in North America, lack confidence and trust in CSPs to deliver cost-effective services. While there is more enterprise trust in CSPs in EMEA and across other regions, CSPs still will have to work diligently to demonstrate that they are capable of providing significant value-add in an SD-WAN context. In addition, CSPs will have to integrate their SD-WAN managed services with their enterprise cloud connectivity services (e.g., AT&T NetBond, Verizon Secure Cloud Interconnect, Level 3 Cloud Connect, BT Cloud Connect, and Orange Business VPN Galerie) to achieve service differentiation and better service stickiness.

Guidance for Enterprise Buyers

Although SD-WAN borrows the core principles of SDN, its value proposition for enterprises stands on its own. In fact, IDC expects that many enterprises that adopt SD-WAN may not yet have made meaningful strides toward SDN in their datacenters. SD-WAN offers compelling value for its ability to defray MPLS costs, simplify and automate WAN operations, improve application traffic management, and dynamically deliver on the cost and efficiency benefits associated with intelligent path selection.

SD-WAN will be particularly relevant for enterprises that have adopted or are adopting hybrid cloud and especially those that are availing themselves of SaaS application services. In these cases, there is a strong motivation to reassess WAN architectures used for application delivery. What made eminent sense on the WAN when client/server applications were housed exclusively in an enterprise datacenter does not make sense when applications reside in the public cloud as well as in the enterprise datacenter or a private cloud. Hybrid cloud demands a policy-based approach to application delivery at branch offices and remote sites, one that potentially leverages broadband Internet and 4G (LTE) technologies as well as traditional VPNs and MPLS.

In this context, enterprises also can use SD-WAN to balance loads across the WAN or to monitor application performance and send traffic over cost-optimal or the most reliable WAN links, depending on application requirements. Similarly, enterprises using cloud-based applications can benefit from SD-WAN's ability to route traffic to and from cloud services and branch locations.

Enterprises facing skills gaps or resource constraints will want to consider CSP SD-WAN managed services, which reduce management overhead and related costs by providing comprehensive deployment and management of SD-WAN solutions, typically based on product offerings from market-leading SD-WAN vendors.

LEARN MORE

Related Research

- *Communication Service Provider Adoption of SD-WAN Technology and Its Impact to MPLS VPN Services* (IDC #US41043816, February 2016)
- *Riverbed Acquires Ocedo, Stakes Claim on SD-WAN and Cloud-Managed Branch Networking Markets* (IDC #lcUS40989716, January 2016)
- *GEN15 Debate: Potential Impact of Software-Defined WAN* (IDC #CA40868616, January 2016)
- *BT's Connect Intelligence IWAN SD-WAN Solution - New Communication Choices for the Cloud-Connected Enterprise* (IDC #lcUS40989516, January 2016)
- *IDC Predictions 2016: Worldwide Enterprise Communications Infrastructure* (IDC #US40987016, January 2016)

Synopsis

This IDC study provides a technology assessment and update for SD-WAN, which includes a market forecast for products and services through 2020. It looks at the market drivers for SD-WAN and considers how the various market segments will grow and evolve, including the role that CSPs and MSPs will potentially play in this rapidly evolving space.

"Digital transformation of the enterprise based on the 3rd Platform pillars of cloud and mobility is having profound ramifications for network infrastructure and network services provided to the enterprise by vendors and service providers alike. Cloud computing and hybrid architectures, in particular, are driving significant changes to how WANs are architected, built, and managed to support increasingly critical cloud-based application workloads. As a result, the market for SD-WAN products and services will grow impressively for the next several years, reaching $6 billion in 2020." – Rohit Mehra, vice president, Network Infrastructure, IDC

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Global Headquarters

5 Speen Street
Framingham, MA 01701
USA
508.872.8200
Twitter: @IDC
idc-community.com
www.idc.com