
Time to Think Outside the Box

The logo for Ashton, Metzler & Associates features a central dark blue rectangle with white text. This rectangle is set within a larger, light blue diamond shape that has four triangular points extending outwards. The text inside the rectangle reads "Ashton, Metzler & Associates" in a bold, serif font, with a thin white horizontal line below it. Underneath the line, the tagline "Leverage Technology & Talent for Success" is written in a smaller, sans-serif font.

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Introduction

For the last few years SD-WAN have been the hottest topic in networking. Over that time-frame both the use cases and the enabling technologies have developed to a point that the deployment of SD-WANs is in the process of *crossing the chasm* to where these solutions are beginning to be widely used by mainstream network organizations and not just a handful of early adopters.

There are several characteristics that all SD-WAN solutions share. For example, all SD-WAN solutions enable network organizations to either replace or supplement expensive MPLS circuits with inexpensive broadband circuits. However, when evaluating SD-WAN solutions, network organizations need to realize that there are many characteristics that distinguish one solution from another. One critical characteristic is whether the SD-WAN solution is best-of-breed or is part of a big-box solution that combines SD-WAN functionality along with legacy functionality such as WAN optimization or modern functionality such as security.

Big-box solutions are nothing new. Providers of such solutions typically argue that their solutions provide value because *the whole is greater than the sum of the parts*. The crux of this argument is that a big-box solution provides value because the functionality it provides is integrated. This argument, however, implicitly acknowledges the widely accepted fact that these solutions typically provide functionality that is merely *good enough* and that they seldom, if ever, provide best-of-breed functionality or even integrated management.

The goal of this white paper is to analyze why network organizations that are evaluating SD-WAN solutions should focus their attention on best-of-breed solutions. Part of this analysis will demonstrate how the changing business environment demands a best-of-breed SD-WAN solution while at the same time the evolving technological environment is making it increasingly both desirable and easy to integrate best-of-breed functionality into a holistic solution.

The Traditional Battle Between Best-of-Breed and Big Box Solutions

The branch office WAN architecture that most organizations currently use was initially deployed roughly twenty years ago. As is the case with any architecture, that architecture was heavily influenced by the technological environment that existed at that time. One of the key characteristics of that IT environment is that cloud computing, which is ubiquitous in the current environment, wasn't on anybody's radar screen.

The branch office WAN architecture that emerged at the turn of the century was designed with the goal of enabling users in a branch office to access resources in a corporate data center. Because cloud computing was yet to become a reality, the architecture required that the appliances that provided the necessary WAN functionality be housed on premise, either in a branch office or in a corporate site such as a data center.

In the early stages of implementing this architecture, network vendors focused their development efforts on bringing best-of-breed, single function appliances to market. For example, during this

era, router vendors focused all their energy and development resources into supporting as wide an array of protocols and interfaces as possible. In similar fashion, during this era when network organizations were in the process of implementing new WAN functionality they looked for best-of-breed solutions based on the depth and quality of the functionality that the appliances provided.

But the era in which vendors focused on providing feature-rich, single function appliances soon began to fade. As this happened, the industry entered an era in which some large vendors, either through internal development, but more commonly through acquisition, began to offer big-box solutions that provided a large and growing range of WAN-related functions, either integrated directly into the code base or deployed on-box in a virtualized manner. During the big-box era, instead of competing based on providing best-of-breed functionality, these large vendors began to compete based on how many different types of functionality they had in their platform. The providers of this type of big-box solution relied on the traditional argument that *the whole is greater than the sum of the parts*. Bolstering their argument was the fact that during the big-box era the alternative approach, integrating best-of-breed functionality into a holistic solution, was difficult to do.

The Limitations of a Big Box Solution

One of the key limitations of a big box solution has already been discussed – it prevents users from having access to best-of-breed functionality. There are, however, several other limitations of a big box approach, many of which are heightened by the rapid pace by which companies, primarily startups, bring new functionality to market.

The rapid pace of new product introduction has created an environment that is in sharp contrast to the environment that led to the current big box environment. When the current big box era began, there were relatively few classes of branch office WAN functionality available. As such, while it was not always achieved, it was a reasonable goal to attempt to tightly integrate all the available functionality in a single box.

Given the breadth of functionality that is currently used in branch office WANs, combined with that rapid pace of new functionality being brought to market, it is at best an aspirational goal to think that it is possible to tightly integrate all that functionality into a single box. What typically happens is that the solutions that are brought to market have a somewhat loosely integrated set of *good enough* functionality that is a subset of what is required, and which still must be integrated with the functionality that the box doesn't provide.

The Requirement for a Best-of-Breed SD-WAN Solution

As mentioned, when the branch office WAN architecture that most organizations currently use was initially deployed, the IT industry was in an era characterized by best-of-breed solutions that were designed to enable a robust, efficiently managed network infrastructure. For example, the multiprotocol routers that were previously mentioned enabled network organizations to

reduce equipment and effort by having the same staff administer all necessary protocols on a single routing platform. While deploying this generation of best-of-breed appliances had a business impact, it was small and very indirect.

Business success has always relied on a company having an effective network infrastructure. The impact that the network infrastructure has on business success has dramatically increased over the last couple of years. One of the major drivers of that increased impact is the movement that companies are making to become a digital business. According to [a recent report](#), 89% of enterprises have plans to adopt or have already adopted a digital-first business strategy with a myriad of goals. This includes:

- Digitally modifying their business and/or processes
- Developing new digital business/revenue
- Providing secure, optimized anywhere/anytime access to assets
- Meeting customer experience expectations

The report stated that Application Programming Interfaces (APIs) are a key enabling technology and went on to say that, “Application Programming Interfaces, the language for getting systems to communicate and share data with one another, are becoming essential business tools for sharing data among siloed systems and external data-sharing to allow collaboration that can improve operations and customer service.”

As companies evolve to become a digital business, the role of the IT organization changes dramatically. Instead of its traditional somewhat passive role of aligning its activities with those of the business, IT organizations become an active partner with the business and as a result, business success is more dependent on IT success than it ever has been.

As noted, any *good enough* SD-WAN solution will enable a company to either replace or supplement expensive MPLS circuits with inexpensive broadband circuits. However, while reducing the cost of the WAN is a good thing, it will not enable a company to implement a digital-first business strategy and enjoy the benefits listed above. To enable a digital-first business strategy, network organizations must choose a best-of-breed SD-WAN solution that not only reduces cost, but also [ensures acceptable application delivery](#). This means that the SD-WAN solution must ensure that the applications that an enterprise uses:

- Exhibit acceptable performance
- Can be effectively managed, monitored, and enforced at a granular level
- Incorporate appropriate levels of security and compliance
- Can be flexibly deployed and supported

It’s not possible to ensure acceptable application delivery with a *good enough* SD-WAN solution whose architecture is centered around packets and not applications. That follows because since it is packet-centric, the typical *good enough* SD-WAN solution makes decisions about how to define and enforce policies based on network characteristics such as bandwidth, latency, loss,

jitter, or reachability. While these characteristics are a good indicator of the health and performance of the underlying WAN links, they are an ineffective proxy for what business unit managers care about – a secure, high quality user experience.

In contrast to a *good enough* solution, a best-of-breed SD-WAN solution enables network organizations to support a digital-first strategy by making it easy for the organization to define and enforce top-down, application specific policies for how traffic should be treated with the goal of optimizing the performance, security and compliance of those applications. A best-of-breed SD-WAN solution defines top-down policies based on application-focused functionality, such as deep packet inspection, fingerprinting, correlation, and application recognition, which enables the solution to understand the performance, compliance and security requirements of an application. It enforces these policies based on both the health and performance of the underlying WAN links and the application itself. For example, as part of making enforcement decisions, a best-of-breed SD-WAN solution considers application metrics such as transaction response time, application-layer reachability, and the mean opinion score (MOS).

The Factors Making Integration More Important and Easier

As noted, one of the factors that enabled the emergence of the big-box era was that at the time when that era started it was very difficult to integrate network functionality. However, over the last several years several industry trends have resulted in the broad deployment of technologies that make it both more desirable and easier to do this integration.

The Broad Adoption of Cloud Computing

In sharp contrast to the environment when the current branch office WAN was first implemented, over the last few years companies of all sizes and in all industry segments have continued to make increased adoption of cloud computing. In a recent report, [RightScale](#) described the current state of cloud computing. According to that report, 96% of organizations currently use cloud solutions, and on average, organizations use almost 5 clouds.

In addition to the broad use of SaaS, IaaS, and PaaS, another way that the adoption of cloud computing has manifested itself is that IT organizations increasingly rely on cloud providers for a large and growing range of best-of-breed networking functionality. One of the more popular cloud providers of networking functionality is [Zscaler](#), which provides a spectrum of security functionality including URL filtering, anti-virus, and DNS security. This approach to acquiring network functionality provides so much value to network organizations that a new class of provider, referred to as Cloud Application Security Brokers (CASBs), has emerged. The goal of CASBs is to enforce the security, compliance, and governance policies that ensure the successful delivery of cloud-based applications. In most cases, the networking functionality provided by this burgeoning set of best-of-breed vendors is accessed using an API.

While having access to a large set of best-of-breed CASBs provides significant value, it also presents challenges. One of those challenges is that CASBs typically charge for their services

based on how much traffic those services process. If all traffic is sent to a CASB, whether the traffic needs the service of the CASB or not, that results in unnecessary expense. To avoid this situation and hence minimize cost, a best-of-breed SD-WAN solution enables a true multi-cloud environment whereby the solution provides fine-grained control over which traffic is sent to which cloud, whereas a good-enough SD-WAN solution might blindly forward everything.

The Emergence of Software Defined Everything (SDX)

Until recently, networking functionality was provided by hardware-centric devices that performed both the forwarding and control functions. That approach began to dramatically change several years ago with the initial deployment of Software Defined Networking (SDN). One of the key characteristics of SDN is that the control and forwarding functions were separated and the control function was centralized. Another key characteristic is that like the approach taken by the providers of the business applications that are enabling the Digital-first movement, SDN vendors leverage APIs to allow easy access to the networking functionality they provide.

Since the initial deployment of SDN, the key concepts of being *software defined* have been applied across the entire IT infrastructure. Examples include the software defined data center, software defined storage, and the SD-WAN.

A result of the ubiquitous adoption of software-defined concepts to all of classes of IT functionality combined the emergence of vendors such as CASBs, is that now virtually all IT functionality, whether it is provided on premise or in the cloud, can be accessed via an API.

Summary and Call to Action

Driven by evolving requirements and enabled by emerging technologies, the IT environment goes through predictable cycles. For example, there are times when a hardware-centric approach dominates and times when a software-centric approach dominates. In similar fashion, there are times when a centralized approach to IT dominates and times when a decentralized approach dominates.

The network era that was in place at the turn of the century featured best of breed products that were designed to enable a robust, efficiently managed network infrastructure. As part of the cyclical nature of IT, this era was followed by an era that in which some large vendors began to offer big-box solutions that provided a large and growing range of *good enough* WAN-related functions.

The cyclical nature of IT is again being manifested in the SD-WAN market. As a result, as network organizations evaluate SD-WAN solutions they must shift their attention away from big box solutions and focus on best-of-breed solutions that were designed to enable network organizations to not only reduce cost but to also ensure acceptable application delivery. While ensuring acceptable application delivery is not a new requirement, the broad adoption of a Digital-first business strategy has given a heightened sense of urgency to the requirement.

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While the shift to best-of-breed SD-WAN solutions is driven by the need to ensure acceptable application delivery, it is enabled by multiple factors. One factor is that propelled by technological megatrends, such as the broad movement to SDX, there is a large and growing use of APIs. APIs enable systems of all types to communicate and share data with each other. Another factor driving this shift to best-of-breed SD-WAN solutions is that it is now common to acquire best of breed network functionality from cloud providers. Because of these highly synergistic factors, it is now easy to integrate a best-of-breed SD-WAN solution with complimentary best-of-breed functionality, whether that functionality is provided on premise or in the cloud.