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THE RIGHT SD-WAN

Delivers Risk-Free, Reliable Multi-Cloud Migration

WHITE PAPER

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INTRODUCTION: CLOUD SUCCESS DEPENDS ON NETWORK TRANSFORMATION

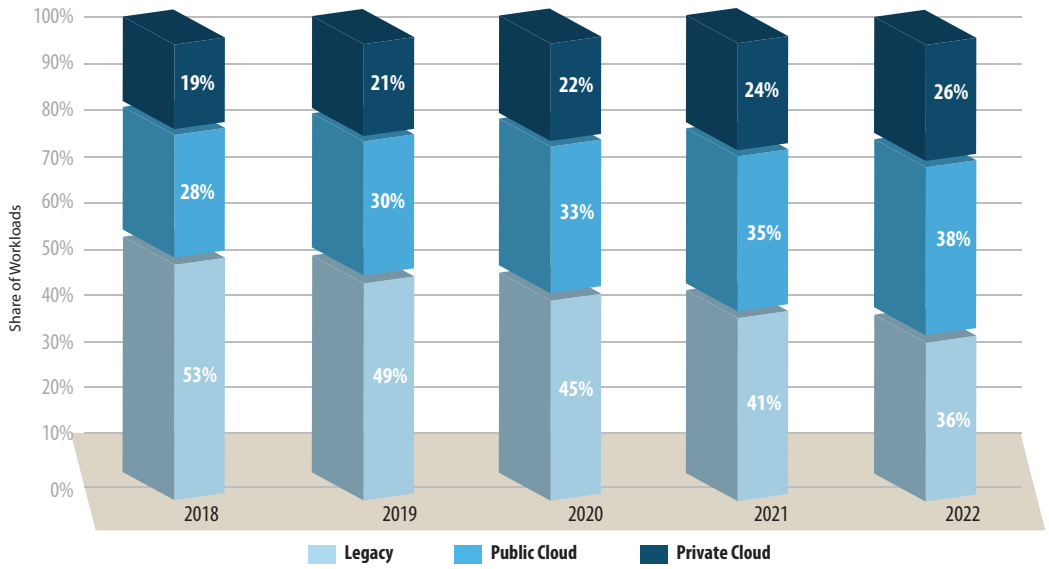
Businesses are evolving faster than ever. Key technologies such as the cloud, mobility and the Internet of Things (IoT) are enabling organizations to undertake broad and deep digital transformation projects, changing the way companies operate, creating new business models and lifting employee productivity to new heights.

As digital transformation takes hold in enterprises, a parallel shift is occurring from massive centralized data centers to the cloud and then to the edge of the network. It is at the network edge where customer engagement and rich interactions are now happening, and where status-quo Multiprotocol Label Switching (MPLS) networks are no longer enough. It's also where customers and enterprises alike generate valuable data and insights. But to make it work—and to extract every bit of value—this information needs to be connected back to the business.

This is no longer theory; it's actually happening today. The ZK Research 2019 Cloud Forecast provides all the proof you need. This five-year forecast for cloud computing shows workloads in traditional data centers are on a sharp decline, with public and hybrid clouds ascending. In 2018, traditional on-premises data centers held 53% of workloads, while public and private cloud held a combined 47%. By the end of 2019, traditional IT infrastructure will dip below 50%, and it will sit at 36% in 2022, when public and private cloud combined will hold 64% of the market (Exhibit 1).

Although the term "cloud" is singular in nature, the reality is that there is no single public cloud provider or deployment model ideally suited to meeting every organizational need. IT leaders

Exhibit 1: Cloud to Overtake Legacy in 2019



ZK Research 2019 Cloud Forecast

ABOUT THE AUTHOR

Zeus Kerravala is the founder and principal analyst with ZK Research. Kerravala provides tactical advice and strategic guidance to help his clients in both the current business climate and the long term. He delivers research and insight to the following constituents: end-user IT and network managers; vendors of IT hardware, software and services; and members of the financial community looking to invest in the companies that he covers.

need to prepare for multi-cloud environments by seamlessly blending a mix of private and multiple public clouds. The need for the multi-cloud enterprise is driven by the fact that no two applications are the same. Enterprises have a goal of migrating many, most or all of their applications to the cloud. Simple applications or non-critical ones are easy to move to the cloud, but mission-critical back-office processes as well as real-time or highly interactive applications must be always available and perform consistently. Public clouds offer ease of deployment and speed, while private clouds historically have brought greater control and predictability plus high reliability, resiliency and uptime.

One of the most significant impacts of technology's rapid evolution is the fact that the network must evolve to enable organizations to fully capitalize on the resulting hyperconnectivity. Networking has always been about connecting users to applications, but apps were more centralized in the private data center era. Now, apps are distributed and data is everywhere, so networking—particularly the wide-area network (WAN)—must evolve to make a multi-cloud environment look like one seamless cloud and deliver application performance and predictability that is at least as good as the private WAN, private data center approach.

We now sit on the precipice of another massive change. With compute resources more scattered everywhere, networks must transform to a software-defined WAN (SD-WAN) to handle the changing demands.

Network evolution occurred with every major compute change—from the mainframe days when the network was simple, to the client/server era when the network became more complex, to the dawn of the internet age when the network was suddenly mission critical. At each step, the network changed and became increasingly more valuable.

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SECTION II: INTRODUCTION TO SD-WANS

The current architecture used to design business WANs has been in place for more than 30 years. The existing model was created for predictable traffic flows from client/server computing and best-effort internet traffic. The centralized architecture is optimized for manageability but lacks the kind of dynamism that is required for today's diverse and varied traffic types driven by multi-cloud, mobile users, extranets and telecommuters.

The evolving business climate is putting new demands on the WAN that cannot be met with legacy deployment models due to four challenges:

- Inefficient use of bandwidth from active/passive architectures
- High cost of bandwidth resulting from an overreliance on expensive MPLS connections that don't "do" cloud access
- Little to no automation capabilities
- Poor user experience and application performance, as the network could not be fine-tuned to deliver application quality of experience (QoE) using a multi-network WAN fabric

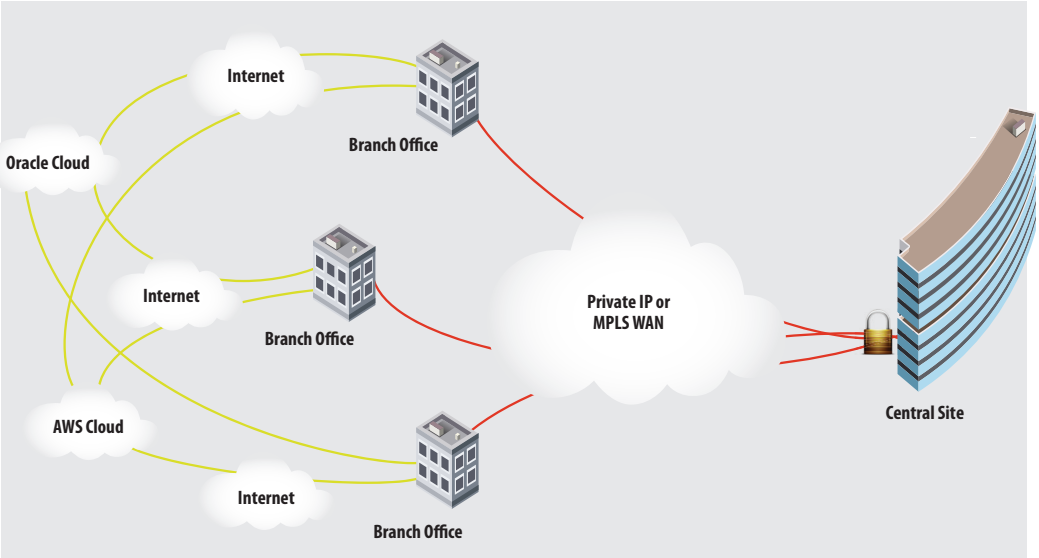
Traditional MPLS combined with technologies such as WAN Optimization are no longer sufficient. SD-WANs are the logical next generation of WAN architecture optimized for the cloud computing era. They use any combination of MPLS and/or internet connections (Exhibit 2) and are built on the concepts of openness, agility, orchestration, analytics and security. SD-WANs enable application policies that automate configuration changes, move traffic flows or enact other changes to help the network continually meet the needs of the organization. Most SD-WAN offerings bring these eight advanced capabilities to the network:

- Agile network to increase the speed of operations
- Secure overlay with increased security posture
- Centralized control for faster orchestration and policy control
- Use of internet connections to lower costs and expand reach
- Support for multiple WAN links
- Zero-touch provisioning to simplify operations and deployment
- Connectivity to public clouds
- Deployment flexibility using physical or virtual appliances

SECTION III: FAILSAFE TECHNOLOGY MAKES SD-WANS BETTER

The attributes listed in Section II are "table stakes" enterprise SD-WAN features. Looking at a more granular level, decision makers need to consider that not all SD-WAN vendor offerings are created equal. Some approaches offer only the basic features, while others add several advanced capabilities to make SD-WANs better.

Exhibit 2: SD-WANs Aggregate Multi-Cloud Services



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One such capability is known as "failsafe," and it delivers MPLS-class high availability and high QoE for predictable application performance (Exhibit 3). Failsafe works for non–real-time applications such as email, customer-relationship management (CRM) and virtual desktop infrastructure (VDI) as well as real-time applications including voice over IP (VoIP) and video—regardless of whether the SD-WAN is built on hybrid MPLS plus internet or internet only. The technology works by continuously monitoring network attributes such as latency, packet loss and jitter and dynamically adjusting the path of traffic at sub-second intervals to optimize the performance of every application.

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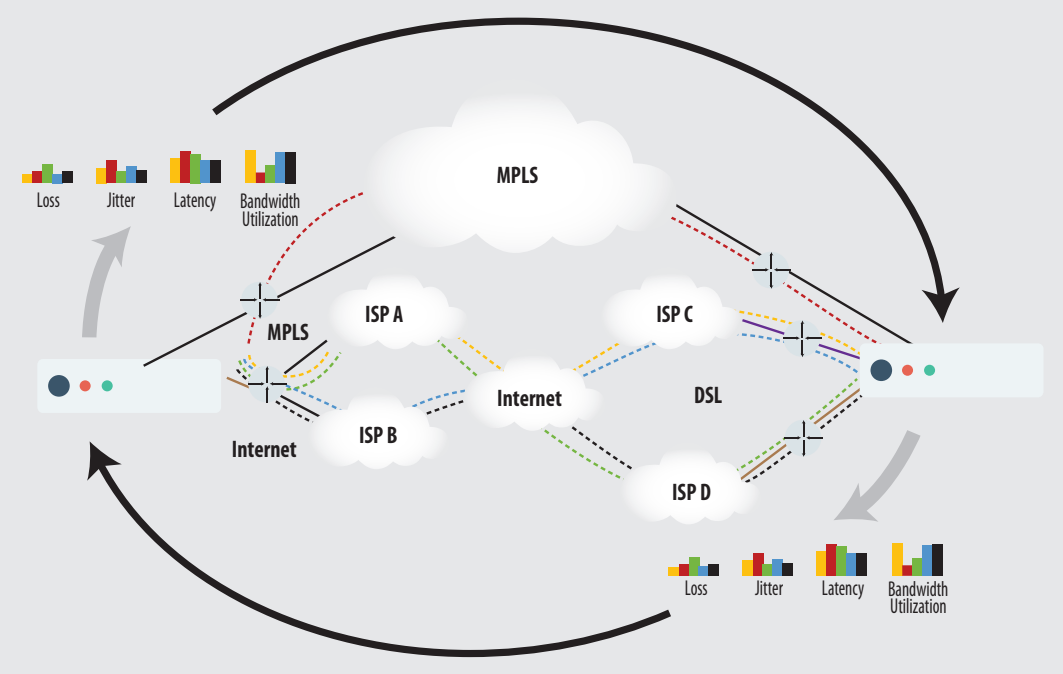
Without failsafe, SD-WANs fail to live up to their potential. The multi-path capabilities used in most SD-WAN solutions enable certain types of traffic to be routed over different connections, but they can't mitigate many failures in real time. Consider the example of a business setting up an SD-WAN where voice and video are carried over MPLS and the rest of the traffic is carried over the internet. In the event of an MPLS failure or "brownout," traffic would likely switch to the internet after several minutes, causing a short outage. A bigger problem occurs at those times when the MPLS network becomes congested and voice and video perform poorly. Because the connection is technically up, the non-failsafe SD-WAN continues to send traffic over the MPLS, maintaining the poor performance. A network manager might eventually notice or be informed by a worker and make the change manually, but SD-WANs are supposed to be dynamic.

Exhibit 3: Failsafe Improves SD-WAN Performance



ZK Research, 2019

Instead, failsafe delivers MPLS-class high availability combined with predictable application performance. Failsafe removes the historical risks of depending on traditional internet connections for business traffic and safely enables a no-compromises way of evolving the WAN. This is key to moving apps to the cloud, as without this key capability, the network will have a significant negative impact on cloud performance and reliability. Without failsafe, cloud migration may fail and any return on the investment (ROI) the company was hoping to attain could be lost.

An SD-WAN lacking failsafe capabilities is a step backward from the MPLS-level reliability and predictability that IT and users have come to expect from the WAN. In some sense, MPLS delivers failsafe capabilities but lacks the agility of incorporating higher bandwidth and far less costly public internet connectivity. Businesses need the confidence that cloud applications and services will perform as needed over the network. Any SD-WAN lacking failsafe can't deliver that level of business assurance. An SD-WAN with failsafe offers the best of both worlds, as it provides a safe, cost-effective way to deliver predictable QoE, which is critical for multi-cloud enterprises seeking complete network and cloud application reliability.

Talari's 10-plus years of experience coupled with great customer service have resulted in a Net Promoter Score of greater than 90, which is well above the industry average for networking companies.

SECTION IV: ORACLE + TALARI DELIVERS SD-WAN TECHNOLOGY WITH FAILSAFE

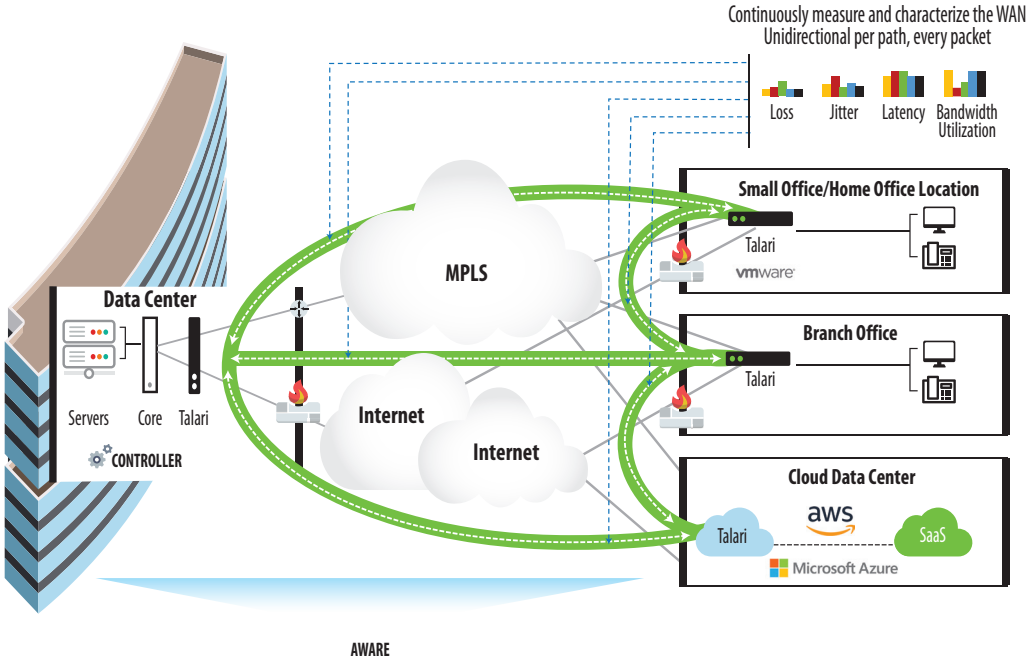
San Jose–based Talari Networks was founded in 2007, making it one of the pioneers in SD-WAN technology. The company was recently acquired by Oracle and is part of the firm's Communications group business unit. Oracle's purchase of Talari makes it the first major public cloud provider to offer an SD-WAN solution. The stability, large channel and financial resources that Oracle brings are a great complement to the technology and innovation that Talari offers. Talari's 10-plus years of experience coupled with great customer service have resulted in a Net Promoter Score of greater than 90, which is well above the industry average for networking companies. Its customers include many of the world's largest and innovative companies.

The Oracle + Talari SD-WAN solution utilizes a unique measurement technology that is essential to its differentiation and its ability to deliver failsafe SD-WANs. Like many SD-WAN offerings, the architecture (Exhibit 4) is composed of the following four components:

- **Controller** to centrally manage and distribute services and application policies
- **Nodes** that deliver cost-effective services and ensure predictable application performance
- **Centralized orchestration** with end-to-end reporting and analytics
- **Cloud connectivity** services optimized from the aggregation of all internet links including colocation services

An Oracle + Talari SD-WAN offers customers carrier-agnostic deployment flexibility; is available per location as a physical appliance, in a virtual form factor or deployed directly in the cloud; and is consumable as opex or capex. It supports an all-internet deployment and/or a hybrid SD-WAN

Exhibit 4: Oracle + Talari SD-WAN Includes Failsafe Technology



Oracle + Talari and ZK Research, 2019

that mixes MPLS and internet. It enables the consolidation of branch infrastructure as it supports routing, WAN Optimization and firewall services. Some network professionals shy away from a single appliance because it creates a single point of failure, but several high-availability (HA) options are offered for both the data center and the branch; additionally, the technology can be deployed in overlay mode with existing WAN infrastructure, making network evolution easier as well as providing an inexpensive form of HA for the branch.

The above capabilities are what ZK Research describes as the "table stakes" features that all vendors should offer, although not all do. The Oracle + Talari SD-WAN's implementation of failsafe delivers several critical capabilities that most do not, including the following:

- **Continuous unidirectional measurement** of all traffic across all possible WAN paths between any pair of SD-WAN locations
- **Sub-second response** to adapt to network events—not just link or router failures, but also congestion-based packet loss and jitter/latency increases that occur frequently on shared IP networks such as the internet

These first two capabilities are critical to any vendor seeking to deliver consistent and predictable application performance when leveraging the pretty good but not perfect public internet.

Beyond this, the Oracle + Talari SD-WAN solution offers several other capabilities that are extremely important to delivering a failsafe SD-WAN:

- **Intelligent link aggregation** that uses all bandwidth across disparate links, even for a single flow
- **Packet replication** enabling high-quality, real-time support
- **Inbound multi-source quality of service (QoS)** so 90%-plus link utilization can be sustained without negatively impacting the user experience
- **Centralized orchestration and analytics** for end-to-end visibility and ease of management
- **Scalability** to meet the demands of large enterprises

Customers utilizing the Oracle + Talari SD-WAN solution realize a number of benefits:

- Price/performance increase of between 50 and 400 times the bandwidth for the same amount of spend
- WAN cost reduction of up to 80%
- Greater reliability and application QoE with a hybrid SD-WAN network versus an MPLS-only network
- Reduced troubleshooting costs because of self-correcting capabilities
- Non-disruptive deployment of existing MPLS and WAN Optimization technologies
- High QoE support for real-time applications
- No lock-in to specific telecom providers

One recent independent proof point for the quality of Talari's solution comes from NSS Labs, which gave Talari its highest "Recommended" rating. Talari was one of only three vendors out of nine to receive this rating in the first comparative test of SD-WAN offerings conducted by NSS Labs.

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SECTION V: CONCLUSION AND RECOMMENDATIONS

The promise of SD-WANs is tremendous, as they align the network with the needs of a multi-cloud enterprise for digital transformation. However, numerous options are available to buyers including over-the-top solutions offering basic connectivity services and approaches integrated with carrier services. These are interesting but often fall short in the area of application performance for real-time applications or predictable access to public cloud services. When this happens, instead of being a business enabler, the SD-WAN holds the company back. Digital businesses need to move fast, and selecting the right failsafe SD-WAN solution is critical.

IT leaders in cloud-first organizations must choose their SD-WAN vendor carefully to ensure it meets the unique demands of a hybrid, multi-cloud environment. The right vendor can "de-risk" the evolution to multi-cloud. With so many options to choose from, the choice may be difficult.

ZK Research offers the following recommendations to help with the decision-making process:

Fully embrace the cloud era. Most organizations have partially embraced the cloud as a new way of doing business. The cloud brings unparalleled levels of elasticity to IT with new consumption models that enable organizations to optimize both utilization levels and IT budget dollars. ZK Research strongly urges all businesses to fully embrace the cloud to shift into the digital business era.

In the cloud era, "good enough" is no longer good enough, and businesses must consider the network a strategic cloud enabler. This isn't your father's IT environment, and it shouldn't rely upon your father's network.

Shed conventional thinking about the network. Historically, the network has been considered "the pipes" and a non-strategic asset. Because of this, best-effort services and rigid architectures were the norm. However, the multi-cloud enterprise depends on a network-centric compute model, and network strategies must now change. In the cloud era, "good enough" is no longer good enough, and businesses must consider the network a strategic cloud enabler. This isn't your father's IT environment, and it shouldn't rely upon your father's network.

Choose your SD-WAN provider based on cloud-app purchasing criteria. Old decision criteria for network services, such as incumbency and market share, will not be enough in the multi-cloud era. Evaluators of network services should align their decision-making criteria with cloud enablers such as failsafe capabilities and cloud application performance.

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