



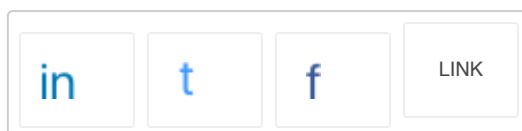
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How to Eliminate Network Application Bottlenecks and Reduce Infrastructure Rollout Times from Months to Hours

CISCO SERVICE PROVIDERS

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Your network should not be a bottleneck to innovation. Your IT infrastructure should not limit the quality of the apps you're running, or the speed of your deployments. This was pie-in-the-sky thinking when hardware was king. Your possibilities were hobbled by the physical limitations of your network and your data centers and there was only so much bandwidth and so many servers you could buy. When you ran out of capacity, you had to build out your infrastructure or lease additional equipment and bandwidth from a third party.

It was cumbersome, and the only way of doing things, but enterprise IT is no longer a walled garden. Applications moved from desktops to virtual machines on internal servers, and now to the cloud. Software has become a service and web-based clients have expanded beyond email and ecommerce.

Reduced Costs and Increased Agility

These days, your business is only limited by your imagination, but you need affordable, expandable, high capacity infrastructure to succeed in the global market. You also require effective and intuitive tools to manage your network devices and to route network traffic.

Your network shouldn't be a bottleneck for innovation.

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It's no secret that SDN technology is transforming IT. SD-WAN is becoming the WAN choice for Enterprise. It takes the best of MPLS and IP-VPN and whatever other available connectivity methods, for example LTE. Over the last two years, over 60% of Vodafone's multinational customers have begun looking at software-defined WAN and we're also seeing increasing demands in local markets.

Some reports claim that the real reason behind the surge in SD-WAN adoption is cost. This is shortsighted. While SD-WAN is lower than MPLS and IP-VPN, it is not the primary reason for adoption. In fact, SD-

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WAN typically sits as a layer on top of these well-proven technologies in hybrid networks.

SD-WAN automates and simplifies network configuration. It enables businesses to consolidate disparate networks into a single centrally managed and monitored entity. As a result, companies can custom configure their networks on the fly to meet application performance and user experience requirements at any given time. Using dashboard-based portals, Vodafone SD-WAN customers are agile, efficient, secure, and self-sufficient. They can adjust to the ever-changing demands of today's cloud-based, virtualized, and mobile computing environments in real time.

Instead of worrying about bandwidth, our customers are free to focus on applications and business outcomes. They can route traffic according to priority. Skype for Business traffic won't slow AWS access. SAP and email will travel along different network pathways.

This level of customizability and control also increases agility, allowing customers to roll out services faster. They can add new applications without being constrained by the time it takes to change the network, and can then tweak parameters in real time. Better network optimization leads to increased availability and reliability.

SD-WAN provides multiple paths for higher network availability.

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When you stop to think about it, a company's network is the glue that holds the enterprise together. It is the heart of every strategic and business initiative. A more flexible network means a more flexible business that is faster to respond, and more competitive.

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As our customers increasingly sought out the many advantages of software-defined network technology, Vodafone started to expand our product portfolio in this area. We immediately gravitated to Cisco as an SD-WAN partner. It was a natural fit, as we already manage Cisco hardware **routers** for a large portion of our WAN customers.

A couple of years ago, we began to introduce capabilities that shifted our products toward SD-WAN. We started with Cisco's application visibility and control (AVC) features that ran on traditional **routers**. AVC uses deep packet inspection to measure application performance for quality of service. It also provides path control by routing application traffic over different parts of the network as necessary.

Reduce network complexity to increase application efficiency.

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We then kept adding new technologies. Cisco's acquisition of Viptela allowed the company to move to a fully-realized cloud-based SD-WAN solution. This is the next logical step for customers already using Cisco technology on their existing MPLS and IP-VPN infrastructure.

One of our first major acquisitions was implementing Viptela's enterprise-class SD-WAN for a major player in the logistics and transportation arena. This customer had planned a phased roll-out across its international operations, but came to us with an emergency request. They needed to speed up the launch of their German presence. Could we prioritize that branch of their network?

In the past, setting up such a branch would have taken months. The average time to deliver a site on a WAN using MPLS was 96 days. With SD-WAN, we had everything up and running in 10 hours. This change was staggering.

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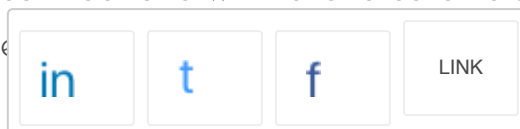
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Speed of deployment was not the only benefit we provided to this customer. We automated their SD-WAN so they could focus on applications and value-adds, instead of having to troubleshoot and reconfigure their infrastructure all the time. Application visibility, centralized network administration, and dashboard-based real-time analytics provide them with a new level of self-reliance. This has transformed their network from another asset that needs to be managed into a tool that powers its core business.

Cisco made this all possible by providing an advanced analytics and reporting experience that is very intuitive. Users can drag and drop different dashboards to create custom network views. They can also schedule reports that are saved as PDFs, and set up alarms that send alerts to mobile phones. These self-managed network capabilities set Cisco apart, and are another major driver behind the adoption of the company's SD-WAN products.

Building a Strong Enterprise Backbone with Cisco

The beauty of our variant of Cisco's SD-WAN offering is that it integrates seamlessly with Cisco's larger portfolio of enterprise solutions. Vodafone was the first Global Provider to launch an MSX enabled Cisco SD-WAN for multinational enterprises. This allows Vodafone to centrally orchestrate Viptela SD-WAN technology together with Cisco's vEdge or Enterprise Network Compute Systems (ENCS) CPE portfolio and a range of virtualised network functions and managed network services. Vodafone's SD-WAN offer is flexible to different enterprise deployment requirements, and it comes with a full suite of ITIL service management capabilities and global operations support 24/7/365. It can be provided together with Vodafone MPLS, Internet or 4G connectivity in over 182 countries worldwide, and it is possible to overlay existing 3rd party networks where this is a requirement. Vodafone's SD-WAN caters to multinationals that need to integrate network applications and connect sites of a variety of sizes. Our global network is ready to support enterprise cloud services adoption, offering improved reliability and quality of service for business critical applications, leveraging direct connections with a choice of cloud providers across the globe. We can also combine



solutions (HCS)

with SD-WAN to provide unified communications solutions that bridge traditional, mobile, and virtual infrastructure. We call this our “better together” integrated solution.

Cisco has also enabled us to develop a number of easy transition paths to Vodafone’s SD-WAN services. This allows a speedy rollout of new services for customers for whom we’re not the incumbent WAN provider. It also allows a seamless move to SD-WAN technology for our existing MPLS and IP-VPN accounts.

Enterprise demand is spiralling as SD-WAN provides the network solution to a number of digital enterprise initiatives from cloud connectivity to IoT backhaul. We’re innovating as an organization like never before and delivering offerings our customers can’t live without.

In the end, the most important consideration is providing reliable, always-on, self-optimizing, and easy-to-manage networks supporting uninterrupted business. After all, the backbone of every business is its enterprise network, and when that backbone is strong, the sky’s the limit.

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