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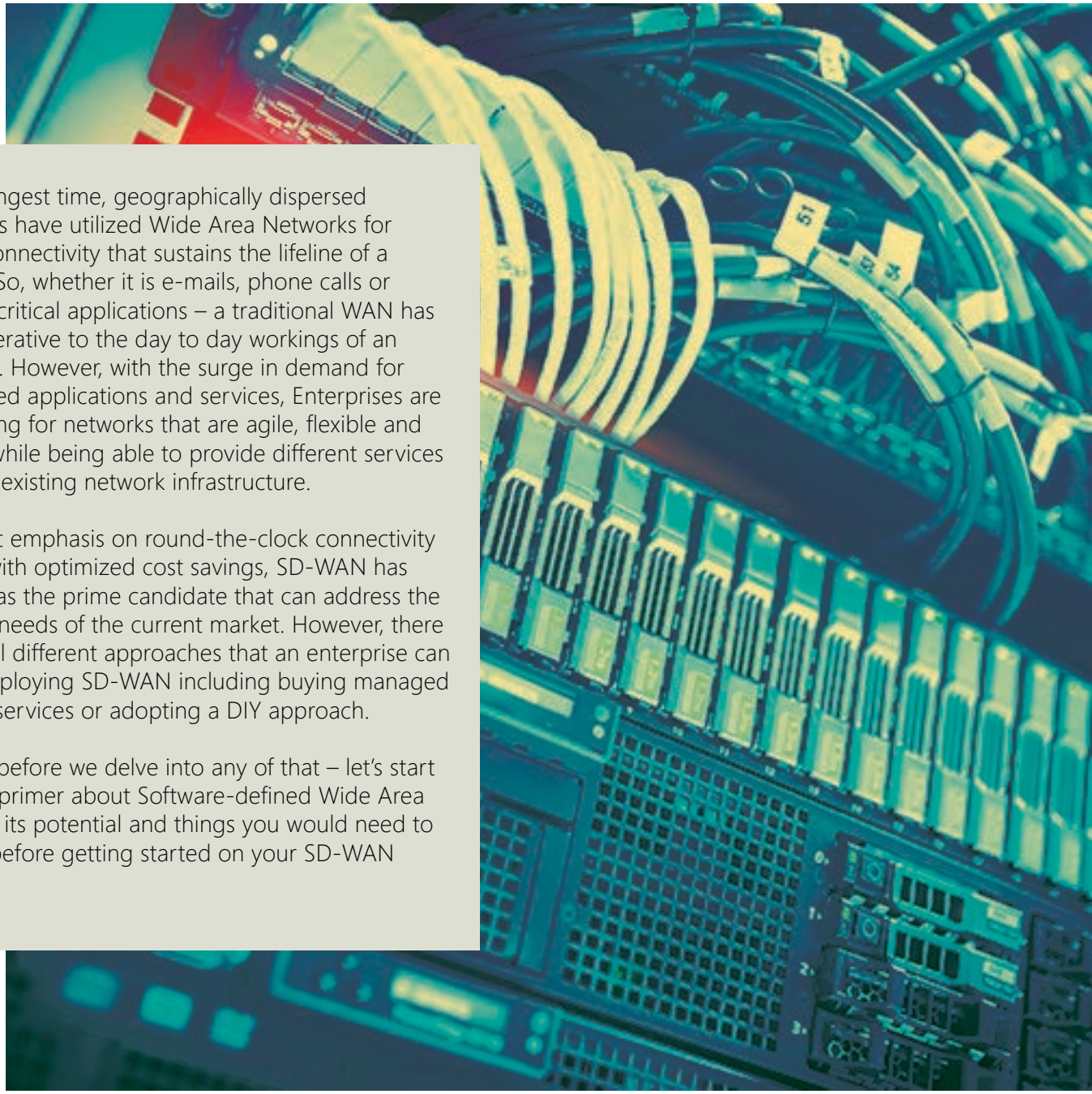
The Mindful IT Company

# A MEASURED APPROACH TO MAKING **SD-WAN** WORK MEASURABLY FOR YOU!



For the longest time, geographically dispersed enterprises have utilized Wide Area Networks for optimal connectivity that sustains the lifeline of a business. So, whether it is e-mails, phone calls or access to critical applications – a traditional WAN has been imperative to the day to day workings of an enterprise. However, with the surge in demand for cloud based applications and services, Enterprises are now looking for networks that are agile, flexible and dynamic while being able to provide different services over their existing network infrastructure.

With great emphasis on round-the-clock connectivity coupled with optimized cost savings, SD-WAN has emerged as the prime candidate that can address the changing needs of the current market. However, there are several different approaches that an enterprise can take to deploying SD-WAN including buying managed SD-WAN services or adopting a DIY approach.

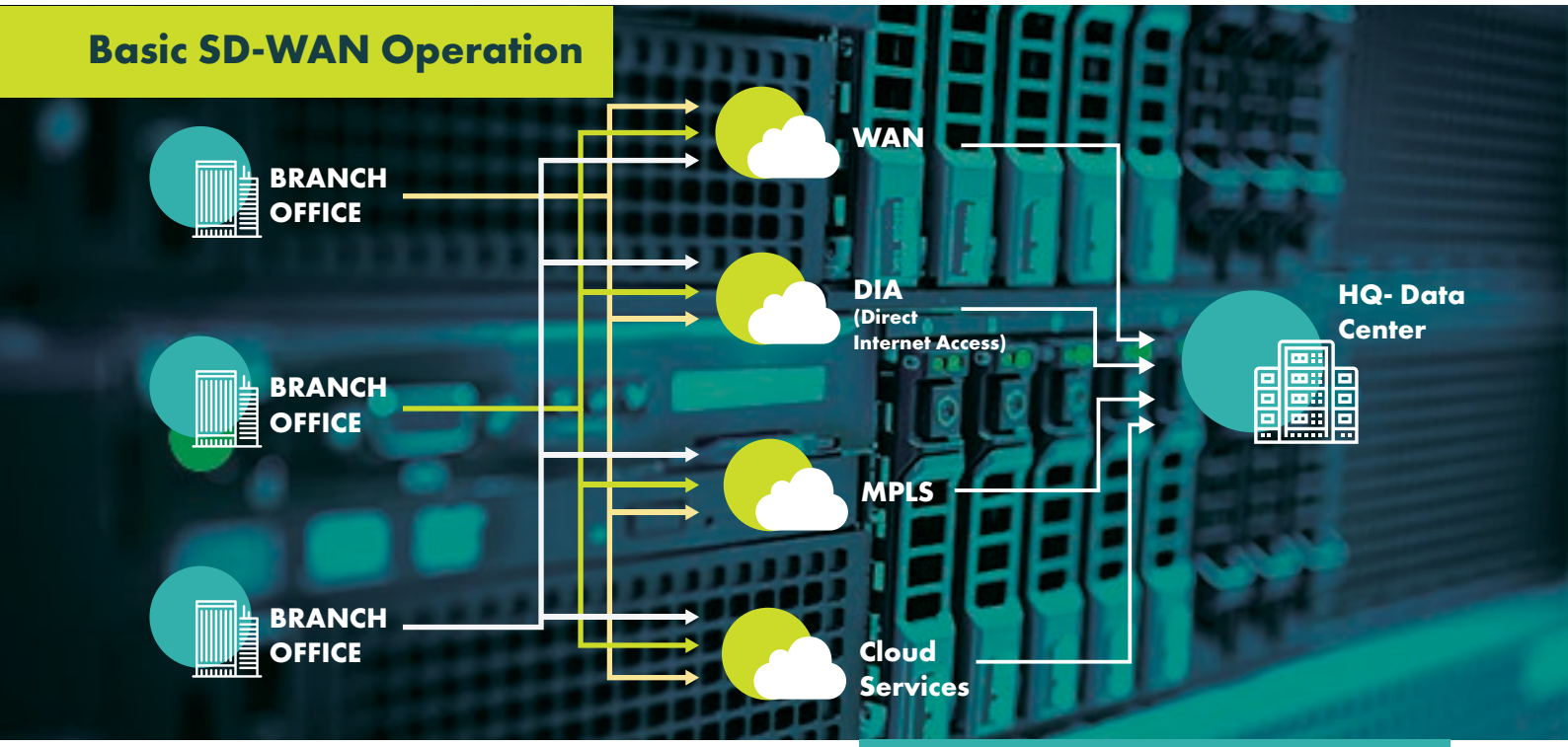
However, before we delve into any of that – let's start off with a primer about Software-defined Wide Area Networks, its potential and things you would need to evaluate before getting started on your SD-WAN journey.

# WHAT IS SD-WAN AND SD-WAN AS A SERVICE?

Managing enterprise network connectivity and circuit costs has always been a huge challenge. However, it is now possible to address this problem with an automated and, programmatic approach called SD-WAN or Software-defined Wide Area Networks. Building upon the idea of SDN, it extends software defined networking into an application that businesses can instantly use to quickly create a smart "hybrid WAN". This WAN comprises of a business-grade IP, VPN, broadband internet, and wireless services.

With the advent of the cloud, it is also equally important to manage a company's growing number of applications and, this can be achieved using a Hybrid WAN architecture. Traffic is automatically and dynamically forwarded across the most appropriate and efficient WAN path based on parameters like – network conditions, security and quality-of-service and cost of the circuit. The routing policies are eventually determined by the enterprise customer.

## Basic SD-WAN Operation



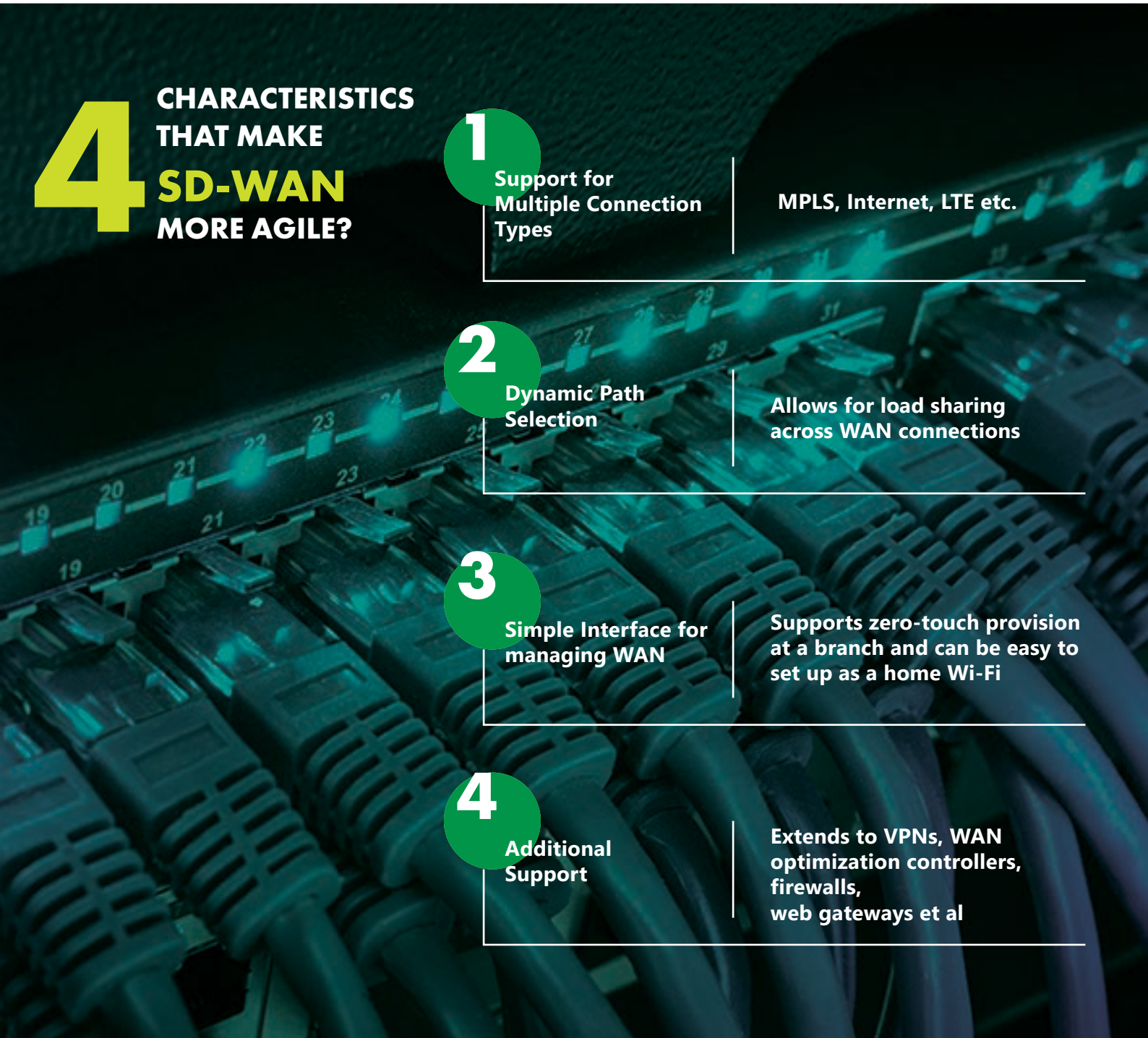

SD-WAN connectivity can be delivered to customers as a managed service using software orchestration and is called SD-WAN as a Service. The allure of SD-WAN lies in the fact that it is a replacement for traditional WAN routers and supports transport technologies like MPLS, Internet, and LTE. SD-WAN also allows load sharing of traffic across multiple WAN connections, thus making it more efficient.

# WHY SHOULD YOU CONSIDER ADOPTING SD-WAN?

SD-WAN helps businesses become more agile by enhancing business productivity and dramatically lowering costs. SD-WAN can be thought of as a little brother to its more well-known sibling Software-defined Networking (SDN). They're related – both software-defined, but while SDN is meant for internal data centers at a campus or headquarter, SD-WAN takes those similar software-defined concepts and the decoupling of the control plane from the data plane onto the WAN.

To put it simply,

**"SDN is an architecture, whereas SD-WAN is a technology you can buy."**



## 4 CHARACTERISTICS THAT MAKE SD-WAN MORE AGILE?

1. **Support for Multiple Connection Types** — MPLS, Internet, LTE etc.
2. **Dynamic Path Selection** — Allows for load sharing across WAN connections
3. **Simple Interface for managing WAN** — Supports zero-touch provision at a branch and can be easy to set up as a home Wi-Fi
4. **Additional Support** — Extends to VPNs, WAN optimization controllers, firewalls, web gateways et al

# THE MASSIVE POTENTIAL OF **SD-WAN**

## THE PROOF IS IN THE NUMBERS!

Being a relatively new concept, SD-WAN currently has a less than 5% market share, however it enjoys tremendous upside. According to most industry predictions, in the next two years there would be approximately 25% users who'll be managing their WAN through software. As a market, SD-WAN is likely to hit the $1 billion market threshold this year and grow by around 69.6% to more than $8 billion by 2020.

As has been the case with Compute and Storage, it is a given that networking will also embrace a software defined architecture to take advantage of agility and cost savings. SD-WAN is its most compelling use case to date and with product maturity accelerating the pace of deployments and simplifying ongoing orchestrations, it is only a matter of time before SD-WAN becomes a mainstay. It goes without saying that with SD-WAN, error prone manual configuration becomes a relic of the past.

## Interested in SD-WAN?

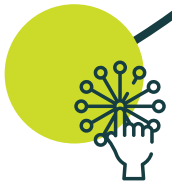
Things to evaluate closely.

### SECURITY

For additional protection, there is a need for sensitive traffic to be routed through more robust firewalls or cloud based security services. Also, business policy rules can be put in place through a management console to authorize traffic-routing through cloud based services. As a result, the traffic is either backhauled or routed directly through the internet. This can be achieved by combining SD-WAN appliances with a firewall and VPN.

### DIRECT CLOUD ACCESS

To manage network traffic of a customer application, SD-WAN can be deployed as a gateway on Microsoft Azure or AWS public clouds. SD-WAN fees can be passed on to the cloud provider for simplified usage based billing.



### DIGITAL EXPERIENCE MANAGEMENT (DEM)

It is always difficult for IT to monitor end user devices across the network, leading to uncertainty from significant visibility gaps. An integrated digital experience management tool is designed to provide visibility for the end user devices across the entire network and applications whether it's running on premise or deployed in the cloud. DEM gives IT teams the ability to detect and troubleshoot performance issues before hand.

# BUILDING AN ENTERPRISE GRADE **SD-WAN**

An Enterprise grade SD-WAN model has a lot of attractive benefits associated with it, prime of which is an excellent return on investment (ROI) followed by economies of scale and data center flexibility.

To be truly characterized as an enterprise grade SD-WAN, the solution must provide the following critical features:

## MULTIPLE TRANSPORT PATHS

SD-WAN is an overlay solution that provides a hitherto unavailable ability to work on any transport, allowing for better flexibility around what network connectivity options customers have at their sites.

## OPERATIONAL EFFICIENCY

Operational efficiency can be achieved with technologies like virtualization, zero-touch/low-touch provisioning, centralized operations and increased administrative automation. Automating and centralizing control can contribute towards providing huge cost benefits while optimizing the number of people required to deploy and manage the network.

## CENTRALIZED CONTROL AND MANAGEMENT

SD-WAN, by definition is Software-defined, hence it provides centralized policy management as a core functionality which enterprises can cash upon. With SD-WAN it is also easy to switch back to centralized controllers from distributed controllers. It allows functionalities like downloading an image automatically in addition to ease of configuration and self-installation.

## END-TO-END SECURITY

SD-WAN also offers an overlay architecture, simplified configuration and improved management. As a result, attacks are instantly quarantined and malicious entities are blocked from the rest of the network.

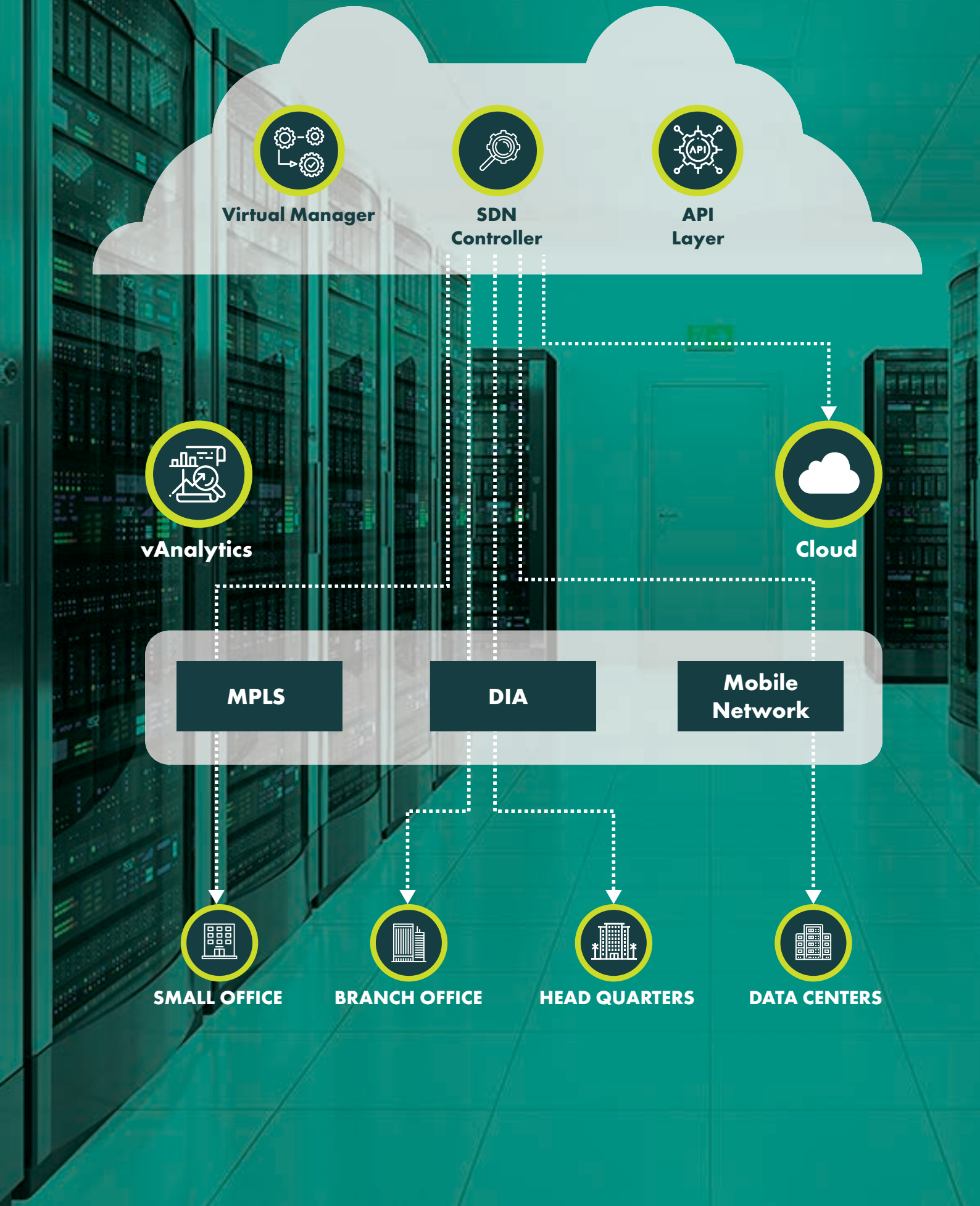
## EXPANSION TO THE CLOUD

SD-WAN establishes an efficient connection to the cloud and provides improved visibility end-to-end. It also makes it easier to quickly move and manage SAS applications into the public cloud without hampering performance and security.

## APPROPRIATE SERVICE LEVEL AGREEMENTS

While deploying an SD-WAN solution, a business will have to consider the network configuration that suits their transformation needs and how the SD-WAN software can complement that. Enterprises should also look for hybrid networking SLAs that organically incorporate SD-WAN where applicable.

## Enterprise Grade SD-WAN Architecture



# TAKING A **DIY APPROACH?**

With the right IT skills, enterprises can manage their own SD-WAN. In addition to being an obvious cost benefit, it can allow enterprises to elevate their environments that managed options often can't provide.

The main benefit of deciding to go with a do-it-yourself (DIY) approach to SD-WAN is that enterprises have much more control, can integrate SD-WAN into their other technology projects, and can work unhurried as per their own timeline.

**Here are some of the other benefits of going DIY with SD-WAN:**

Enterprises can have complete access in securing their SD-WAN network while choosing a DIY approach.

Enterprises having their footprints across the globe can have specialized geography based apps that work within different regulatory frameworks.

Procuring, owning, deploying and managing the SD-WAN equipment, software and network connectivity in-house is a definitive advantage.

Enterprises gets a chance to tweak the features to any extent as they get access to the complete features package.

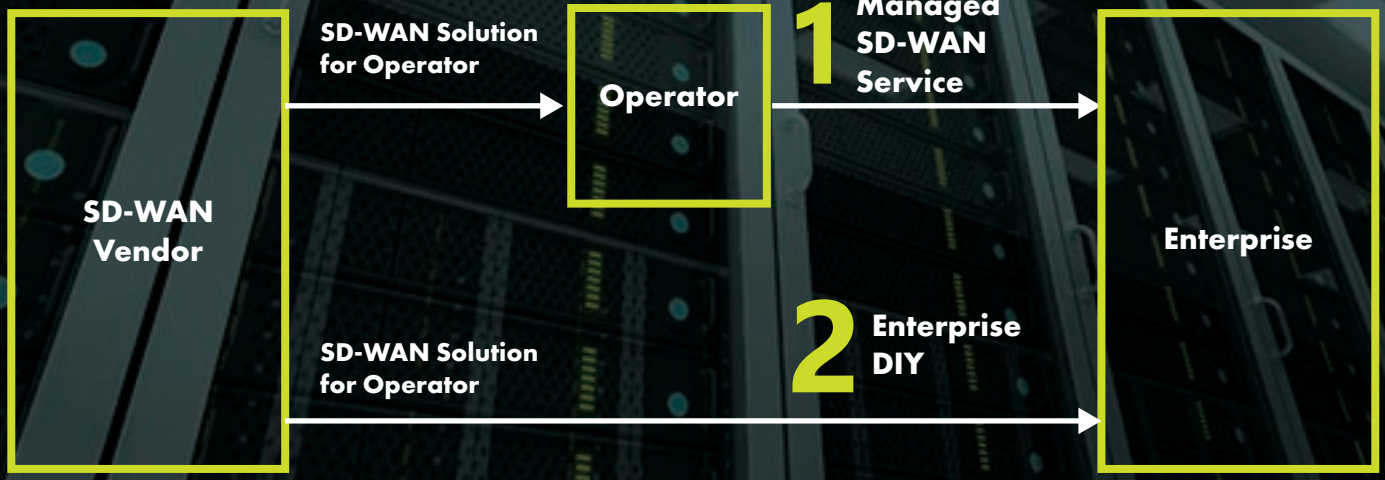
Enterprises can handle change management and control software versions they are using.

Enterprises owning virtual environments can obtain huge cost benefits when they run SD-WAN on a common and shared platform.

As SD-WAN complements an agile network, it is easy to flip sites and scale resources up and down.

Enterprises can leverage REST API for configuration or management that's aligned with DevOps, including full access to all the statistics, reporting, APIs for security and visibility for performance monitoring.

Even the largest of enterprises are not above being attracted by the allure of technology that is practically free. One of the biggest joys that IT departments have is to break free from the chains of "vendor lock-in" and avoid having to pour in heavy investments into a particular vendor's solution and then being forced into a corner to keep buying the 'latest & greatest' as they have to keep the show running. DIY SD-WAN allows enterprises to use existing network components and integrate new pieces through a flexible and modular architecture.




TWO SCENARIOS FOR SD-WAN
**DIFFERENCE FROM AN ENTERPRISE PERSPECTIVE**

Here are few scenarios of how an enterprise's network ecosystem can enable DIY SD-WAN:

**1**

Open source SDN controllers are modular thus providing centralized control for any SDN architecture regardless of vendor.

**2**

Enterprises can now choose any Arm or x86 hardware to deploy multiple, tested, preconfigured, and automatically provisioned VNFs, and start providing rich carrier grade services that are fast and simple using open virtualization technologies.

**3**

Open source network virtualization platforms such as OpenStack can give the business access to NFV capabilities, thereby abstracting the functions of the network from the physical hardware and providing orchestration and management capabilities through Open Source Mano or ONAP.

# SERVICE ASSURANCE IN **SD-WAN**

Software defined Wide area networks (SD-WAN) assure the rapid and cost-effective delivery of new and elastic connectivity options. As is often the case, no new technology comes without its own share of complexities and SD-WAN is no exception – in addition, it also requires an organization to be willing to change culturally. To overcome these new complexities and challenges, solutions that propose end-to-end data and visualization, real-time operations, and closed-loop automation capabilities are required.

Assurance in SD-WAN requires a new level of visibility to achieve the same results. Hence, it is important to take into consideration the following points –

### SERVICE DELIVERY & SERVICE OVERLAY ISSUES

IT Operations teams should have an advanced aerial view and a thorough understanding of how SD-WAN services are delivered across multi domain, multi-vendor networks and hybrid cloud infrastructures. At the same time, it is paramount to also have an understanding about the service overlay issues and their correlation with underlying hybrid infrastructure issues.

### IDENTIFY AND FIX SERVICE ISSUES

Operations teams are required to support both proactive and reactive ticketing systems and define the assurance workflow integration. This is required to address the issues really quick and also identify the root cause of the problems.

# HOW HAPPIEST MINDS CAN HELP WITH AN **SD-WAN SOLUTION**

At Happiest minds, we use our engineering expertise and vibrant product innovation culture to help build a new ecosystem based on collaboration with diverse partners and technologies. Happiest Minds brings together all its expertise to offer comprehensive end to end SD-WAN and Service Assurance solutions which -

- Enable engineering and customization of edge devices.
- Enhance and customize the SDN controller.
- Develop orchestration applications and portals.
- Integrate big data and analytics frameworks and provide visualization tools.
- Assist in independent testing and test automation leveraging our test automation frameworks.
- Aid development of active packet monitoring systems, packet brokers based on commodity. switches as well as virtual brokers for deployment in a virtual environment.
- Enable Service Assurance – Applications and portals to raise trouble tickets be it proactive or reactive.

# HAPPIEST MINDS
# **SUCCESS STORIES**

Happiest Minds has a wide array of success stories in creating engineering value-add across analytics, AI, IoT, UI/UX and security tools which helps us provide a niche and valuable offering to service providers. Our broad expertise in developing end to end software-centric open architecture based solutions positions us uniquely to offer services in the following industries.

Converged solution development including the technology layer (SDN/NFV, Device engineering, Orchestration) and Service layer (service orchestration, service management).

Developed SDN application for the Open Day Light Controller enabling dynamic and policy based route selection.

Integrated DPDK and OVS on x86 based COTS to deliver high performance and near line rate edge device.

Developed a traffic analysis tool and integrated a network analytics solution on the controller to provide network visibility and intelligence.

Developed unified UI interface from which Customers can manage their account, services and the configuration thereof Improving Customer Satisfaction (CSAT) scores by adding operational transparency and self-service capabilities to service catalog for an SD-WAN solution.

Built an ultra-low-cost SD-WAN solution for a leading broadband service provider enabling enterprises to save on Capex and Opex.

Developed test automation framework for a leading provider of multilayer network switches consisting more than ten thousand E2E network scenarios.

Performed functional testing and developed a test automation framework for a leader in network analytics.

# ABOUT HAPPIEST MINDS TECHNOLOGIES

Happiest Minds enables digital transformation for enterprises and technology providers by delivering seamless customer experience, business efficiency and actionable insights through an integrated set of disruptive technologies: big data analytics, internet of things, mobility, cloud, security, unified communications, SDN-NFV, etc. Happiest Minds offers domain-centric solutions applying skills, IPs and functional expertise in IT services, product engineering, infrastructure management and security. These services have applicability across industry sectors such as retail, consumer packaged goods, e-commerce, banking, insurance, hi-tech, engineering R&D, manufacturing, automotive and travel/transportation/hospitality.

Headquartered in Bangalore, India; Happiest Minds has operations in the US, UK, The Netherlands, Australia and Middle East.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