



# SD-WAN OVERVIEW

**The SD-WAN Company**

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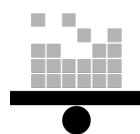


# SD-WAN networking software designed to deliver advanced features and functionality to your business.

**SD-WAN** networking software runs on three principles



Point To Point VPN

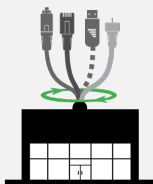


Packet Level Link Balancing



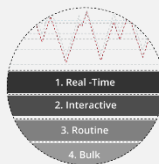
Network Connection Monitoring

All three combined allows us to provide:



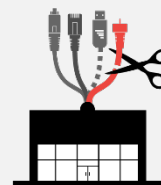
### Bandwidth Aggregation

Combine the bandwidth of multiple Internet connections to increase network speeds.



### QoS Elasticity

Conveniently apply policies on performance and usage to make VoIP calls, video and data transmissions reliable and clean.



### Seamless Failover

If a disruption occurs on a network connection, traffic will automatically adapt to ensure reliable service.



### Transmission Security

Easily encrypt traffic between sites, overlay a centralized firewall, and transmit packets across multiple connections to add extra layers of security.



### Monitoring & Management

Brings the capability to see the entire network - remotely. Built-in secure portal with real-time traffic analytics tracks and predicts actual usage and performance to troubleshoot and relieve IT challenges.

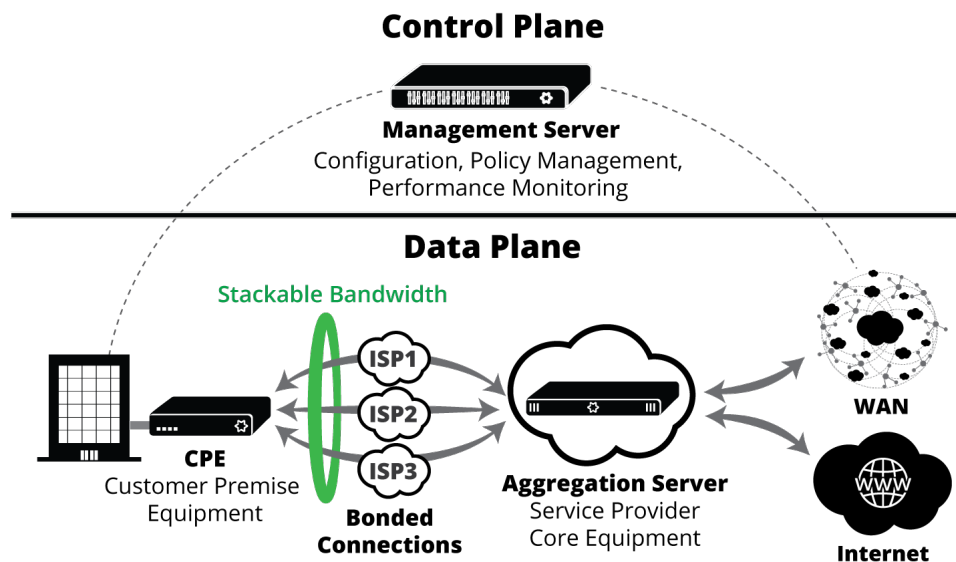
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## Networking software that combines multiple IP connections to create a single, smart pipe.

Create WANs made up of multiple connections, from multiple service providers, in multiple geographies - and apply global rules, alerts, and features easily.



### Technical Details

The technology uses a packet-level distribution algorithm to effectively control WAN paths. The service encapsulates multiple WAN connections into a proprietary, over-the-top protocol that routes traffic over the Internet.

Decisions about traffic shaping, prioritization and balancing are made through a Cloud-based management server that monitors the health of your WAN connections - the control plane. This device then sends traffic-handling information to each of the devices in the network, so that each node knows what it needs to do to ensure the customer experience is optimized.

### How it works

#### Traffic leaving customer's site

The Bonder receives and disassembles the traffic from a LAN node. It then distributes the individual packets across the WAN connections based on rules and policies that have been set in the Management Server. The traffic packets are re-ordered at the Aggregation Server before being sent to the destination host.

#### Traffic going to customer's site

The Aggregation Server broadcasts your customers' IP address(es) and receives all of its traffic. It then disassembles the traffic into packets and sprays those packets across the multiple WAN links - applying customer/ application/class-specific prioritization, cryptography, and/or routing rules. At the customer's site, the Bonder receives the packets and re-orders them before sending them into the LAN and to the recipient node.

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# MONITORING & MANAGEMENT

## Feature Brief

Small & Medium Business



### Life in the Fast Lane with No time to stop

Your day can go from zero to sixty at the drop of a hat. You want to fix your firewall issue, but that email server is acting up. Then, the network goes down. How do you prioritize your day when network outages can't be dealt with until it's too late?

### SD-WAN: See the Big Picture

SD-WAN network monitoring and management service gives you visibility into what really matters to enhance your network experience. We will proactively monitor and alert you of real-time network issues. We will troubleshoot and put out the network-related fire and we help you strategize to make the right network choices with confidence – for now and the future.



### Be Productive in the Fast Lane

Let us expertly pinpoint issues in real-time. We take care of your network so you can focus on what matters – keeping your business productive.

### SD-WAN Benefits

#### PROACTIVE REPORTING OF REAL-TIME NETWORK ISSUES:

- Jitter
- Latency
- Packet-loss
- Bandwidth fluctuation
- Connection state changes
- Throughput/usage

#### PRODUCTIVITY

Solve network headaches that impede your business to get the most out of your network.

Real-time traffic and WAN health configured to align with your business policies.

#### RETURN ON INVESTMENT

Cost-effective solutions designed to optimize IT investments.

#### PEACE OF MIND

Get alerted to issues before they become a problem.

#### VISIBILITY

Secure portal for viewing and managing your entire Wide Area Network (WAN).

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# RELIABILITY

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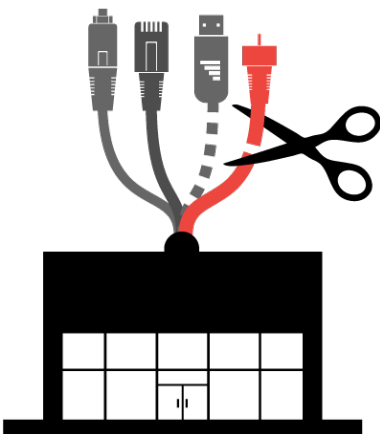
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### Keep Productivity Flowing with NO Downtime

When your connection goes down, it means dropped VoIP calls, cancelled transactions, and widespread inconvenience and frustration. Businesses should be able to rely on a system that can respond quickly and gracefully to those inevitable failures.

### SD-WAN: Reliability with Failover



SD-WAN allows any business to combine multiple Internet connections (regardless of provider or type) to create reliable Internet connectivity. If one connection suddenly degrades or goes offline, your data will continue to flow to its destination uninterrupted. When the problem connection is fixed, the system will automatically add it back to its pipeline. No special configurations or specialists are required. It's that simple.

### Take Your Internet to the Next Level

With robust reliability, businesses can extend their networks to provide customers and users with near 100% uptime. Our Internet Failover Service, gives you the confidence to run your business without the risk of downtime. This always-on feature lets you create the network that's right for your business and save you time and money in the process.

### SD-WAN Benefits

#### 100% UPTIME

Manages the failover of your bond to a supplemental connection (DSL, CABLE, Fibre, 3G/4G/LTE) for ultra-resilient networks.

#### NETWORK REDUNDANCY

Providing a fail safe for when an internet connection suddenly degrades or drops. Your data continues to flow through the remaining healthy links.

#### SIMPLE NO-TOUCH

No need to reconfigure network settings. You could be on a VoIP or Video call when a link degrades or dies and you won't even notice.

#### SAME -IP FAILOVER

Each appliance maintains its own IP address in the event of a failover. No more DNS round-robin time delays.

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# QUALITY OF SERVICE

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### Poor VoIP Call Quality?

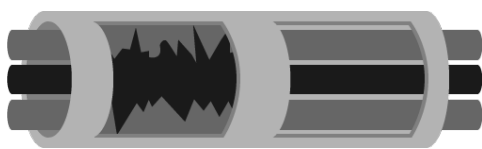
Choppy and dropped calls happen unpredictably. Mixing voice packets with data traffic in a network that was originally set-up to handle only data will lead to voice quality issues. You need a network solution that can eliminate call quality issues.

### SD-WAN: Quality of Service (QoS)

Deliver crystal-clear voice over Internet connections with SD-WAN QoS. Not only is SD-WAN QoS feature completely customizable to fit your business, it's also dynamic to accommodate real-time fluctuations in application usage.

First, fully customizable QoS profiles ensure that your most important applications are prioritized over less sensitive traffic. SD-WAN QoS eliminates latency, jitter, and packet-loss problems by prioritizing applications by class and other criteria your business requires.

Second, our dynamic QoS system adapts to how your network is used. In particular, varying application load requirements and fluctuations in network load are considered. SD-WAN QoS anticipates these factors and smooths out any disturbances so that you always get crystal-clear voice and crisp video.



Without QoS      With QoS

## SD-WAN Benefits

### CUSTOMIZATION

Assign unlimited priority layers inside the connection to ensure consistent delivery of important VoIP and other real-time application data.

### EXPANDABLE CLASS PRIORITY

Allows for bursts in use of prioritized applications to manage the flow of traffic between sites.

### QoS ELASTICITY

As your business's dependence on IP or hosted voice and video applications increases, so does the need for those calls to be crisp and clean. Get the peace of mind that packets will make the trip free of any disturbances.

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# BANDWIDTH

## Feature Brief

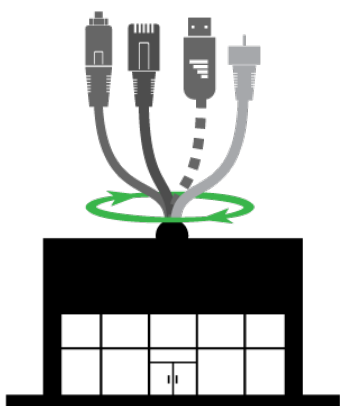
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### How much Bandwidth does my Business need?

It's becoming increasingly difficult to plan for bandwidth needs in today's markets. Bandwidth requirements are based on rapid pace Cloud migration, number of users, data base information, and non-linear complexities. What you need today could easily be too little tomorrow.

### SD-WAN: Scale Bandwidth as needed



With SD-WAN, combine your redundancy connections or any available connections to create a single line that delivers faster download and upload speeds. Our technology allows you to aggregate the bandwidth of all your connections regardless of type or provider to give you the speed and scalability.

### Combine connections for more bandwidth:

	DOWNLOAD	UPLOAD
Primary Connection	75 Mbps	10 Mbps
Back-up Connection	75 Mbps	10 Mbps
<b>Bonded Internet</b>	<b>150 Mbps</b>	<b>20 Mbps</b>

### SD-WAN Benefits

#### INCREASE BANDWIDTH

Enough for all your Cloud and business critical applications.

#### WORKS WITH ANY CONNECTION TYPE

Get the aggregate bandwidth of all connections – no matter which type or providers you use: DSLs, Cable, Fibre, Fixed-Wireless, 4G, LTE, T1, etc.

#### TURBO DATA ACCELERATION

Additional on-demand performance enhancements can be achieved by applying data acceleration to compressible data travelling over the bond.

#### SCALABILITY

Adaptively increase network bandwidth by layering on additional lines, so the network scales to meet your business needs when necessary, at a price you can afford.

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# ENCRYPTION

## Feature Brief

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### Safety In The Digital Age?

Organizations are challenged with putting safeguards in place to protect their valuable digital information. However, the reliance on connectivity in today's business environment means an ever-increasing pace of data creation and dissemination. As data zaps around the globe in milliseconds, do you really know if your transmission is safe?

### SD-WAN: Encryption Protects Your Data



Encryption is the most important privacy-preserving technology available. It protects your data when it's sitting on your computers and when it's being delivered around the Internet. Implementing encryption is essential and we offer DTLS in three cipher strengths - AES128, AES256, and Salsa20 to guard the packets that pass over your various network connections.

### You Take Network Security Seriously, and So Do We

In addition to standard encryption, by its nature SD-WAN technology spreads traffic across multiple Internet connections. Even if an attacker manages to capture one of your individual Internet connections, he will only see a small fragment of your entire traffic. Combined traffic is authenticated by the receiving server with a hash-based message authentication code (HMAC, from RFC2104). This ensures an attacker can't intercept, modify, or forge messages sent between your sites.

### SD-WAN Benefits

#### FIREWALL

Monitor and control the incoming and outgoing network traffic to identify overall network capacity and enforce entry/exit rules associated with applications.

#### TRAFFIC DISTRIBUTION

Breaks up sessions into its smallest possible component and distributes the information down multiple connections to add extra layer of security.

#### ENCRYPTION LEVELS

Provides comprehensive and affordable protection to secure all communications:

- AES 128
- AES 256
- Salsa20

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# LEG TUNING

## Feature Brief



Optimal bandwidth all the time

### Monitor & React to Fluctuations in Bandwidth, Latency, & Packet Loss

#### What's More Important to you, Quality Internet Experience or Speed Without the Quality?

Leg Tuning prioritizes quality over speed, ensuring your business performs its best to serve your customer base. It automatically adjusts the speed and performance of your WAN connections when your network is busy. When links misbehave, The SD-WAN Company's software kicks in and maintains a good customer experience.

#### Manage Jitter & Latency

SD-WAN allows you to integrate multiple circuits into a single, integrated tunnel that delivers higher, always-on bandwidth and redundancy. Leg Tuning monitors the status of each link in the tunnel for deviations from their baseline latency and jitter. When a link is found to exceed its baseline, The SD-WAN Company's software automatically reduces transmission speed. This provides a more stable, predictable end-user experience and reduces tickets created by links with intermittent issues.

Change the Way you Network.  
Maximize the Performance of  
your Bandwidth.

### What Does High Latency Mean for Business?

Excessive latency creates bottlenecks that prevent data from filling the network pipe, decreasing effective bandwidth and delaying packet transit.

Leg Tuning gives businesses better application performance and voice quality, allowing them to provide quality service to their customers.

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## Limitations of Traditional MPLS

Enterprises have typically connected their branch offices through a private Multi-Protocol Label Switching (MPLS) data service. While reliable, traditional MPLS based Wide Area Network (WAN) have two clear limitations:

- (1) Cost prohibitive: up to 10X the price of typical Internet connection
- (2) Lack of general availability: coverage issues, local loop complexity

We've found that roughly 8% of MPLS based WAN branches aren't actually MPLS at all – they're over the public Internet because of reach or high cost. This means almost 1 in every 10 MPLS branches doesn't adhere to corporate WAN policies (security, application assurance, redundancy, and etc). Enterprises that can, spend more than twice as much to incorporate remote sites, compared to urban sites.

## Enterprise Class WAN, Leverage the Internet

Today, savvy network administrators are looking for creative ways to get all the benefits of MPLS, but control costs and maintain uniformity across the WAN. To satisfy these requirements we offer a solution to create a consistent network platform that enhances communication and coordination to include the troublesome 8%. Our cutting edge technology combines multiple low-cost Internet connections into a single, faster and more reliable connection onto which we layer a centralized firewall, end-to-end Quality of Service (QoS), and WAN monitoring management.

## Prepare For the Future

Network technology enables people to communicate to one another. It allows devices to speak to each other in the form data transmission. And, with the average enterprise projected to manage 50 times more data by 2020, the infrastructure supporting the flow of traffic needs to be simple, scalable, and secure. MPLS is one way to ensure real-time application quality on increasingly congested networks, but for a complete solution you need to supplement MPLS. We help your branches that are missing from your MPLS WAN prepare for the future with our MPLS Add-On solution.

## SD-WAN Benefits

### Crystal Clear Voice

Sufficient bandwidth, low latency, with no packet loss.

### Multi-Carrier Solution

Added redundancy and no dependence on a single carrier.

### Cost Reduction

Combines multiple readily available low-cost Internet connections.

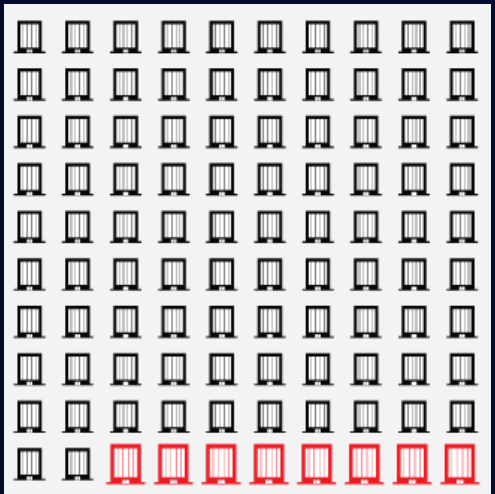
### WAN Link Redundancy

Seamless failover that maintains session traffic, security, and policies.

### The average MPLS WAN:

92% of branch sites are linked to MPLS network

8% are missing out



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## Private Wide Area Network

Multi-site businesses are faced with the challenge of managing traffic routes from site to site quickly and securely using some form of Private Wide Area Network (PWAN). The four most critical factors to consider are:

- 1. Security:** Recent massive data breaches at many large, multi-site enterprises (impacting tens of millions of people) highlight the importance of having safeguards in place to protect your valuable digital information and to meet industry compliance requirements.
- 2. Cost Control:** Organizations spend almost five times as much to incorporate remote sites compared to urban sites due to logistical complexity. The significant over-spend in both CapEx and recurring monthly charges needs to be contained.
- 3. Reliability:** Network failures are inevitable; often caused by way of accidentally cut lines, weather and environment issues, hacking, or other unforeseen issues beyond the control of the service provider. Businesses need a reliable failover system that can respond quickly and gracefully.
- 4. Availability:** Almost 1 in every 10 MPLS branches transmit over the public Internet because of lack of general availability. The ability to easily add users and nodes regardless of geography is a must to future-proof your WAN and meet ever-increasing expectations.

## Side by Side Comparison

**Bonded Internet** compares strongly against today's WAN technologies: Carrier Ethernet, MPLS, and Public Internet.

	<u>Security</u>	<u>Cost Control</u>	<u>Reliability</u>	<u>Availability</u>
<b>HIGH</b>	Carrier Ethernet	Internet	<b>SD-WAN</b>	Internet
↑ ↓	<b>SD-WAN</b>	<b>SD-WAN</b>	Carrier Ethernet	<b>SD-WAN</b>
	MPLS	MPLS	MPLS	MPLS
	Internet	Carrier Ethernet	Internet	Carrier Ethernet
<b>Low</b>				
Goal	Private, robust security features	Leverage cost-effective broadband	Mitigate broadband shortcomings	Readily available anywhere

## Summary

Your goal is to bring together a distributed organization into a secure, reliable, and affordable PWAN that easily accommodates changing requirements.

PWAN using **Bonded Internet** provides the best overall solution to meet critical goals in a simple and convenient way in order to gain control of the WAN and prepare for the future.

Mitigate the security risks of BYOD and Cloud while providing the features users expect.

## Benefits

### Firewall & Encryption

The entire WAN is protected by a centralized firewall and/or encryption to control and manage data.

### Packet Distribution

Spreading packets across multiple connections ensures the information can't be easily stolen.

### Lossless Failover

If a connection fails, traffic dynamically and seamlessly re-routes over online connections ensuring calls aren't lost.

### Stacked Bandwidth

Provides true aggregation of combined connections allowing for a simple solution to accommodate future bandwidth requirements.

### Site-to-Site QoS

Users can enjoy clear voice and data transmissions with customizable queues and filters.

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