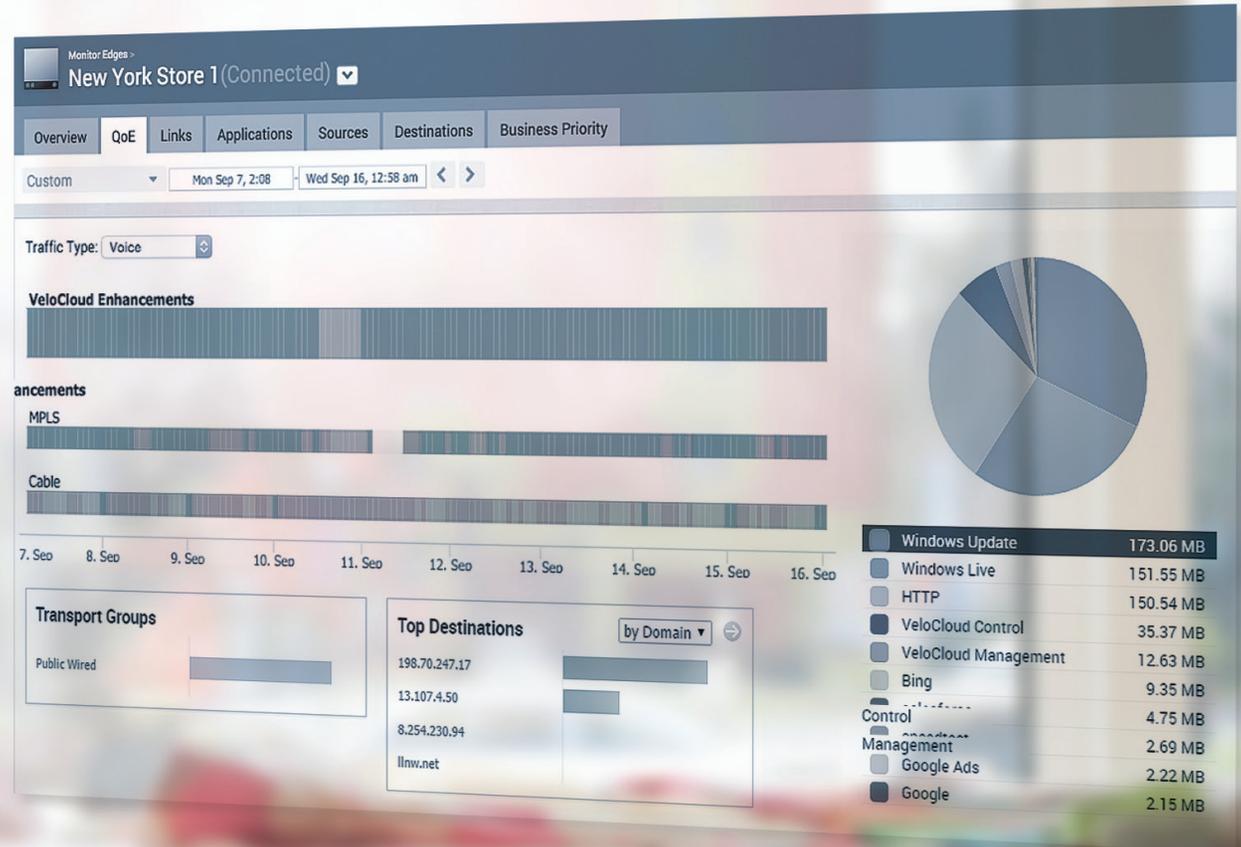


MSx Managed SD-WAN



Guaranteed performance over the cloud without headaches like multiple provider footprints, complex routing, skyrocketing expense, and connectivity or redundancy limitations.

Congratulations! You've added new locations and now look to grow on a regional and national stage. Your business is expanding — but can your network keep up? With Managed SD-WAN, you can count on guaranteed performance delivered over the cloud that creates seamless enterprise connectedness.

We'll take deployment headaches like multiple provider footprints, complex routing, skyrocketing expense and limited connectivity and redundancy options off your desk.

Migraine-inducing spotty Internet performance, inflexible static architecture and slow response times for critical apps can be distant memories. Distance, network hops, slow run times and bandwidth issues go away.

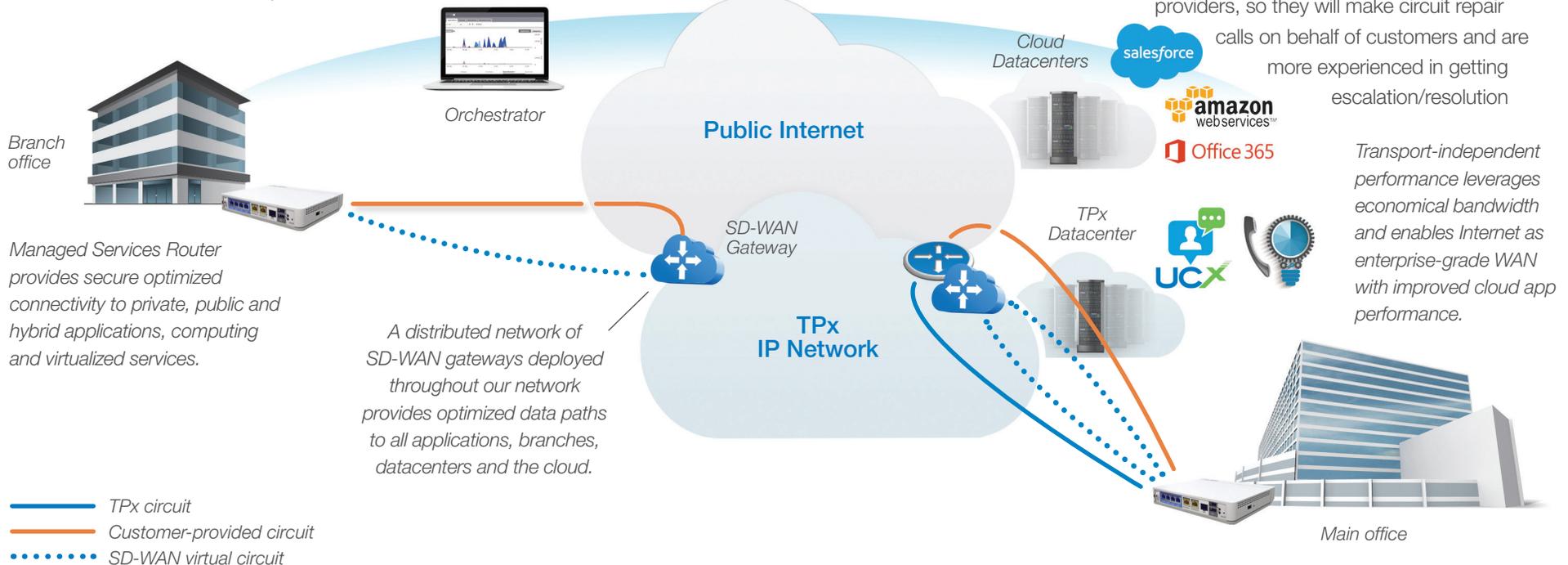
The business map today reflects the greatly expanded, increasingly complicated world out there — and that presents challenges and opportunities that demand new tools, responses and approaches. Managed SD-WAN gives you the resources you need to successfully navigate it, prosper and grow.

SD-WAN is game-changing technology

Managed SD-WAN uses our state-of-the-art managed platform to deliver three key advantages that make your life less stressful:

- Assured application performance**
Transport-independent performance leverages economical bandwidth and enables Internet as enterprise grade WAN (Over-the-Top or OTT)
- Business policy automation**
Simplified IT operation, zero touch deployments and one-click service insertion
- End-to-end management**
Direct cloud access with performance, reliability and security enable powerful end-to-end management

Centralized installation, configuration and monitoring software orchestrates the data flow through the cloud network. It enables one-click provisioning of virtual services in the branch, the cloud, or the enterprise datacenter.



FEATURES & BENEFITS

- Any transport** Managed SD-WAN supports all Internet transport options (EoX, Fixed Wireless, TDM, DSL/cable, and 4G LTE)
- TPx MPLS** Integrates IPVPN and MPLS into a single private network
- Any network** Flexibility to leverage any Internet access regardless of service provider
- Nationwide availability** Option to “Bring your own Bandwidth” allows for national off-net connectivity
- Quality performance** We provide QoS over any network — no “best effort” here
- Secure connectivity** MPLS traffic encrypted with VPN access to our MPLS network
- Cloud VPN** Dynamic edge-to-edge communication via IPsec VPN connectivity

Active-active Leverage the total bandwidth of dual Internet connections

Flexible continuity options Failover options in the event of an unplanned circuit outage is bi-directional; both circuits back up each other

Inbound continuity Provides static public IPs between core network and gateway so internal devices can always be reached by remote users

Application Aware/Smart QoS Customized prioritization of key application data traffic

WAN optimization Forward Error Correction (FEC) improves circuit performance, reducing jitter and packet loss

Orchestrator Write Access Self-manage your service with Read/Write access to the TPx Managed SD-WAN orchestrator

3rd Party Vendor Management Our support team is already working with customer providers, so they will make circuit repair calls on behalf of customers and are more experienced in getting escalation/resolution

- TPx circuit
- Customer-provided circuit
- SD-WAN virtual circuit

MANAGED SD-WAN USE CASES

Custom Profiles

A TPx Managed Services Router (MSR) enables your most critical applications, using smart control customer profiles that take the load off of your IT department. Out-of-the-box defaults set the Quality of Service (QoS) policies for common business objectives so IT simply has to establish traffic priority. Knowledge of application profile enables automation of QoS configurations and bandwidth allocations.

UCx/SIP Over the Top (OTT)

Get our UCx Unified Communications and SmartVoice SIP trunking solutions coast-to-coast anywhere there's a broadband connection. All voice traffic has a high priority policy so that it doesn't compete with public Internet traffic. The circuit may not be TPx, but the Managed Services Router, UCx and SmartVoice are — and we guarantee our performance.

Hybrid WAN

Our customers depend on us to provide them with secure, reliable VPNs leveraging our MPLS network, ①Net. Expand your networking options with a hybrid private network by adding to or replacing expensive T1s with a low-cost, high-bandwidth Internet connection on your existing TPx MPLS network. The resulting solution enables superior customer engagement and end-user experience while removing geographic barriers coast to coast. And you'll have the ideal foundation for future SD-WAN solutions as your needs and applications evolve.

WAN Optimization

WAN connections don't always perform as we expect. When performance degrades there is a hit to your productivity and revenue streams. We can help make sure your connections are optimized by maximizing the efficiency of data flow across your WAN. SD-WAN technology allows the MSR at your site to mitigate packet loss and latency to the managed services network and helps increase the speed and quality of access to critical apps and information.

Multi-circuit Connectivity/Continuity

Mix and match any type of transport provided by TPx or your local Internet or wireless provider to securely and seamlessly fail over to any or all of our core services — MPLS, DIA, SmartVoice, and UCx.

Two Circuits In this setup, both connections, are in active/active mode. That means that the MSR decides, for each traffic session, which path is the best path in that moment. You do not need to feel like you are paying for bandwidth you aren't using.

Three Circuits For added peace of mind, you can utilize three circuits — all active or one in standby mode — for the ultimate measure of connection certainty.

4G LTE TPx is the first to offer SD-WAN over 4G LTE as primary, secondary and redundant options to reduce or eliminate the need for wireline connectivity. In primary configuration, all traffic SD-WAN is transported over the 4G network. In secondary mode, the 4G circuit is active but sharing throughput with a primary wired circuit. In failover mode, the 4G link is dormant until needed for automated failover of the primary circuit.

Inbound continuity This provides static public IPs between core network and gateway to support inbound Internet failover for remote users and web traffic. Without this, inbound traffic is limited to one circuit. So if it goes down, external sources can't reach the site or VPN.



Managed Services Routers (MSR) performs deep application recognition, app/packet steering, and performance metrics to deliver end-to-end QoS.

Our managed services architects will work with you to build a customized solution

Your WAN can become a symphony of private network and OTT Internet connectivity.

WHY TPX

We're implementing Managed SD-WAN so that you can stay ahead of evolving next-gen networks and take full advantage of the latest SD-WAN technology.

- Easily turn on new service
- Enjoy even better customer support
- Have increased application awareness
- Use whatever transport makes the most sense for your enterprise

Network flexibility

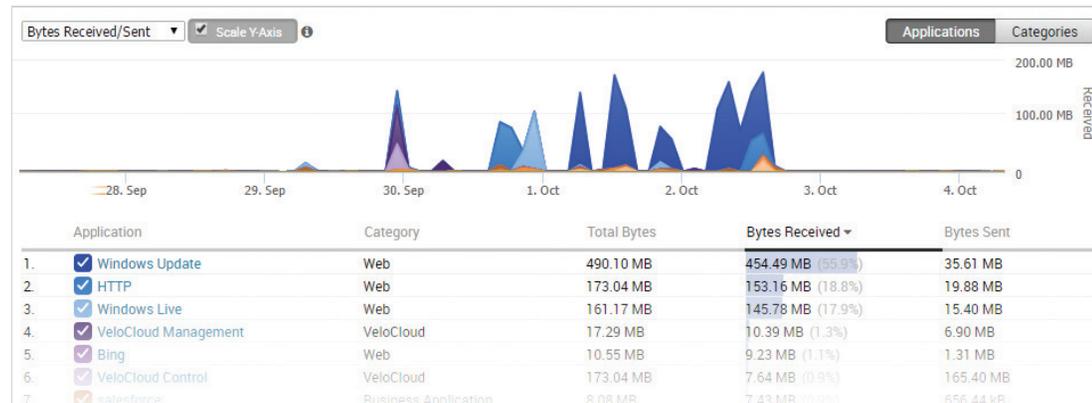
- Use our superior network or go over the top of any carrier — all with guaranteed performance since we manage the delivery
- We prioritize the cloud traffic according to your business priorities
- UCx and SmartVoice are always high priority

Continuity service options

- Seamless failover/continuity
- Active/active circuit design
- Active 4G LTE primary or secondary line
- Inbound continuity
- MPLS, Internet, and voice

Managed services experience

- We know networks
- We know continuity
- We know customer service
- Third-party vendor support
- Smoother implementation
- Much faster trouble ticket resolution



Managed SD-WAN provides optimized data paths across multiple active-active transport options through forward error correction and packet steering to maximize end-to-end quality of service.

Performance monitoring can uncover utilization and throughput issues by tracking application usage and identifying traffic spikes with specific apps.

Supported Features

Feature	Core	Optimum
Multi-services router monitoring	■	■
3-circuit active continuity (TPx provided, OTT, 4G)	■	■
TPx @Net MPLS support	■	■
Dynamic routing (OSPF/BGP)	■	■
IPVPN support	■	■
3rd party circuit monitoring and alerts	■	■
Standardized MSR profile templates	■	■
Customized business policies	Self	TPx
Read-only orchestrator/portal access		■
Read/write orchestrator/portal	■	

Add-ons

- Managed services router (required)
- High availability MSR x 2
- TPx 4G LTE connectivity
- Inbound continuity/failover public IPs
- 3rd party vendor support

MSR Options

6 models — 30, 50, 100, 200, 400, 1000 — based on cumulative bandwidth

Install Options

Self-install (optional); pro-install (default)
Install included with TPx voice/data visit

Packet Fusion

Ellen Pensky

ellen@bumblebeemarketing.net

PACKETFUSION



Connecting the Dots to the Cloud