Build a Wiser WAN.

Managed Software Defined WAN
Demand for bandwidth is growing fast.

- Increasing use of applications like video and web conferencing
- The move of applications to the cloud
- Growth in mobility and the Internet of Things
What you need from WAN is evolving.

<table>
<thead>
<tr>
<th>Traditional WAN Architecture</th>
<th>New WAN architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Buying a good network</td>
<td>• Maintaining application performance</td>
</tr>
</tbody>
</table>

**Access**

<table>
<thead>
<tr>
<th>Traditional WAN Architecture</th>
<th>New WAN architecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Based on TDM paradigm</td>
<td>• Mainly Ethernet based</td>
</tr>
<tr>
<td>• Carrier gradea</td>
<td>• Multiplexed bandwidth</td>
</tr>
<tr>
<td>• Business SLA</td>
<td>• Business or consumer grade as required</td>
</tr>
</tbody>
</table>

**WAN**

<table>
<thead>
<tr>
<th>Traditional WAN Architecture</th>
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<tr>
<td>• Mainly MPLS</td>
<td>• MPLA, Ethernet, internet as transport</td>
</tr>
<tr>
<td>• Public and private network distinction</td>
<td>• Needs transport to be agnostic</td>
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</tbody>
</table>

**Procurement concept**

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<thead>
<tr>
<th>Traditional WAN Architecture</th>
<th>New WAN architecture</th>
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<tbody>
<tr>
<td>• Whole network, single/dual vendor; end-to-end responsibility is important</td>
<td>• Whole network or regional best offers</td>
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</table>

**Security**

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<tr>
<th>Traditional WAN Architecture</th>
<th>New WAN architecture</th>
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<tr>
<td>• Clear trust/no trust distinction</td>
<td>• Elevated complexity</td>
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</tbody>
</table>
A software-defined WAN.
A more intelligent WAN.

<table>
<thead>
<tr>
<th>WAN</th>
<th>SD-WAN</th>
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<tbody>
<tr>
<td>Internet Fail-over</td>
<td>Capacity</td>
</tr>
<tr>
<td>Circuit path</td>
<td>Routing</td>
</tr>
<tr>
<td>Embedded</td>
<td>Security</td>
</tr>
<tr>
<td></td>
<td>Overlaid end-to-end tunnels</td>
</tr>
</tbody>
</table>

For customers, it means

- Application-aware performance
- High availability and performance
- Faster configuration and provisioning
- Cost Control
Hybrid networking.

With SD WAN, you can combine internet and MPLS into one network. This can help:

- Offload non-critical application traffic on more cost effective transport
- Leverage diverse networks and access at an application level
A better way to connect to the cloud.

Secure Cloud Interconnect

Internet peering point

MPLS

Application-aware routing

Users

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Application-aware routing.

Legacy WAN
Routes defined simply to connect sites

SD WAN
Application-aware routing to maintain performance
SD WAN creates a smarter network.

- Near real-time monitoring
- Reporting of network conditions
- Performance-based routing
- High efficiency and performance
Verizon Managed SD WAN
SD WAN creates a smarter network.

Challenges:
- Responding to rapidly evolving technology
- Coping with unique corporate requirements
- Obtaining application-oriented skills and systems
- Managing multiple carrier relationships

Verizon Managed SD WAN can help address these challenges, providing you:
- Integrated service and single service level agreement (SLA)
- Fast time to adoption
- Strong solution resiliency and high availability
- Increased visibility and control
Managing the pieces of your SD WAN.
Delivered Managed WAN through our integrated service platform.

- Verizon MPLS
- Broadband
- Internet
- Correlated fault monitoring
- Life-cycle management
- Availability SLA
- Vendor hardware
- Vendor software
How we enable application-aware routing.

Application inventory and assessment -> Ongoing application path analysis and fault resolution -> WAN analysis -> Visibility and reporting -> Engineering

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WAN analysis overview.

Application flow-enabled routers export data to flow collectors, which send reports to the Verizon Enterprise Center.

Verizon Enterprise Center customer portal

Performance center

LAN

Flow collector

CA polling servers

LAN

Verizon MPLS network

SIP phone

LAN

Customer edge (CE) router

SIP phone

Application servers

LAN

CE LAN switch

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Managed firewall options.

We offer three options for securing traffic coming from dedicated internet access.

- Customer premises firewall
- Cisco IOS® firewall
- Cloud-based firewall services
A managed WAN optimization option.

- Managed WAN Optimization
  - Improved WAN utilization
  - Application-aware routing
  - Dynamic WAN path routing
- Application acceleration
  - Non-existent
  - Extensive
Why doing it yourself doesn’t make sense.

- Multiple vendors
- Limited control of network
- Limited end-to-end visibility
- Risk of errors and extended resolution times
- High cost of ongoing 24x7x365 support and maintenance
- Constant training and support costs

Verizon Managed SD WAN

- “One stop shop” to reduce finger pointing
- Diversity with MPLS, internet and Broadband
- Full end-to-end visibility of the network
- Quick isolation and resolution of faults
- E-bonding and automation technology used to reduce human intervention
- High network availability while controlling total cost of operation and maintenance
Accomplish more with our Managed Services.

- 4,000+ networks under management
- 26+ years managing customer networks
- 1,000+ personnel with key certifications

**Strengthen security**
Manage risk and address compliance with visibility around the globe

**Better Peace of mind**

**Improve flexibility**
Choose the level of connectivity you need

**Better Experiences**

**Improve performance**
Manage from the application down—Not device up

**Better business results**
Appendix: remote site design options

- Centralized internet breakout
- Regionalized internet breakout
- Local internet breakout
Centralized internet breakout

Remote site → Critical

Non-critical → Private IP

Internet → Data center

Managed firewall (on-premises or cloud-based)
Regionalized internet breakout

Remote site

Critical

Non-critical

Private IP

Managed Cloud Security Services

Internet

Data center
Local internet breakout

Remote site

Direct access to internet via a remote device

Critical

Non-critical

Private IP

Internet

Data center
Thank you.

Make your net work.