

# Verizon Managed WAN Services:

## Managed SD WAN Using Viptela, Cisco, and Versa CPE Options

### Comparing SD WAN Services

August 2018

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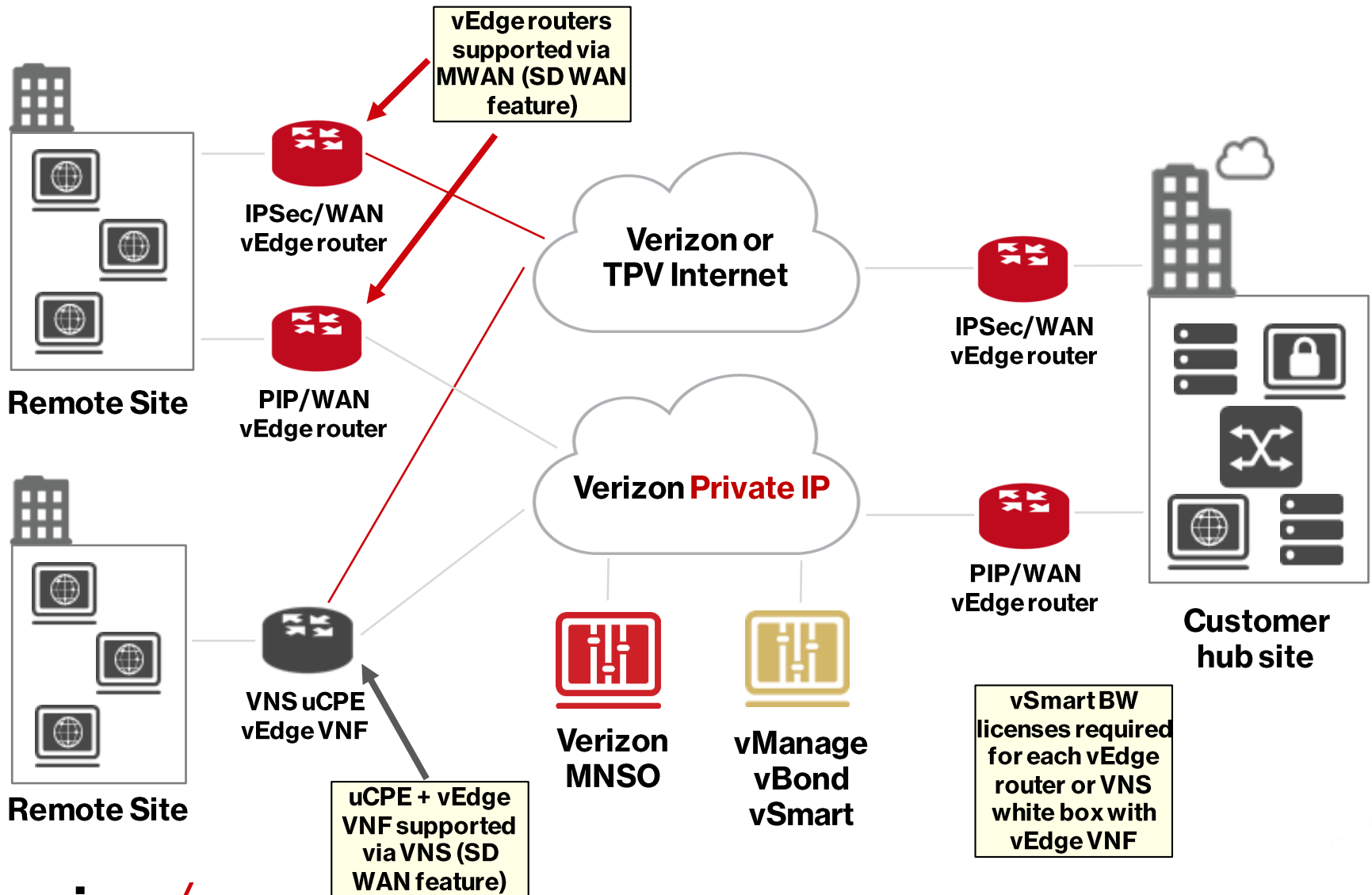
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## Verizon SD WAN Services

- **Cisco SD WAN was launched August 2015**
  - First managed SD WAN service from a service provider
- **Viptela SD WAN was launched May 2016**
  - (VNS option launched in 2017)
- **Versa Software Defined Secure Branch launches August 2017**
  - SD WAN and Security functions supported with same software
  - Options available under MWAN and VNS
  - Light touch and full service security options provided
- **Services offered to customers do differ for each vendor**
  - SD WAN controller designs are different for each vendor
  - Commercial models are different (capex vs. opex)
  - MWAN and VNS options are not the same across each vendor
  - Catalog structures (features selected, etc.) are different for each vendor

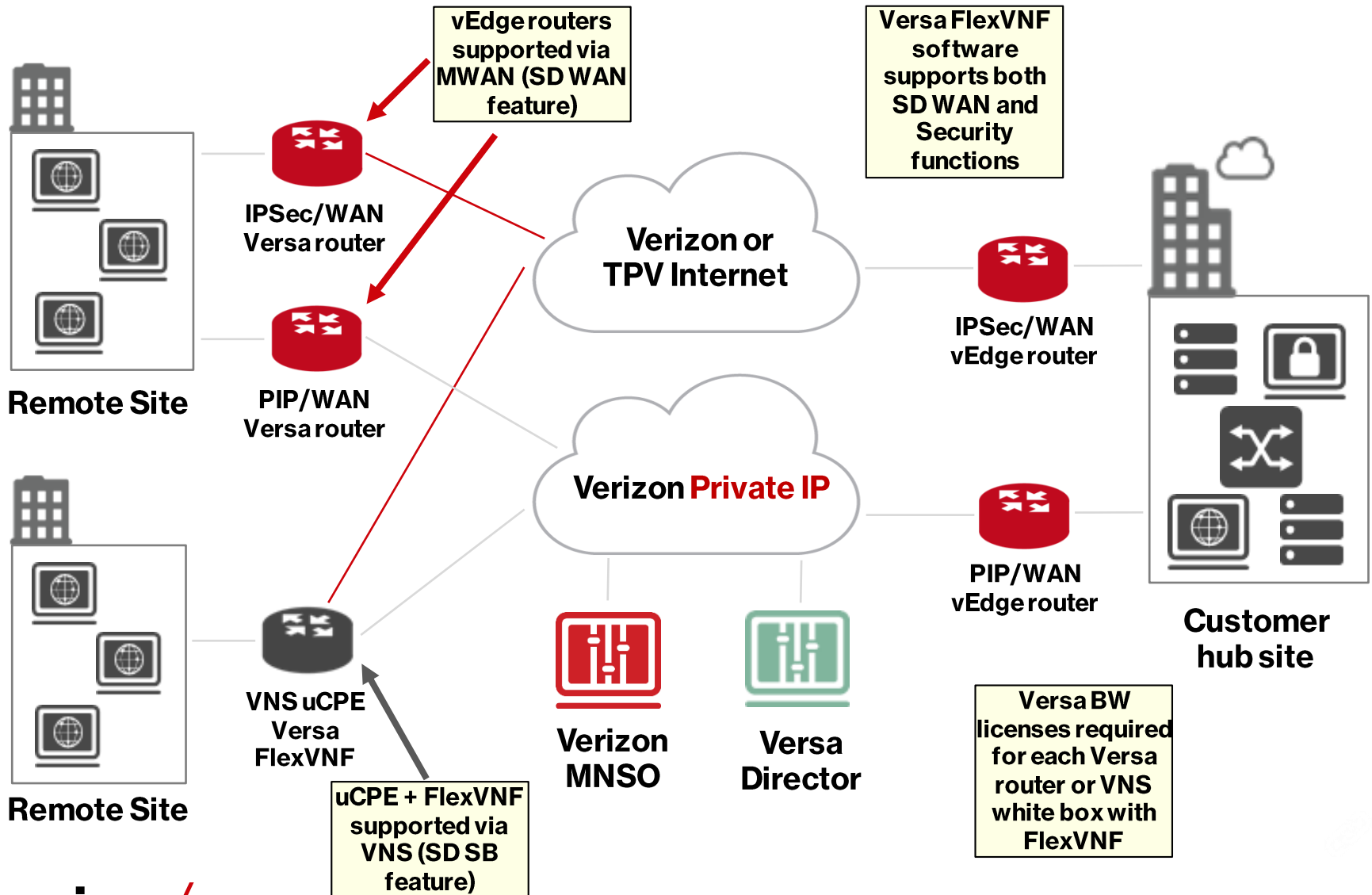
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# PIP / WAN with Viptela SD WAN



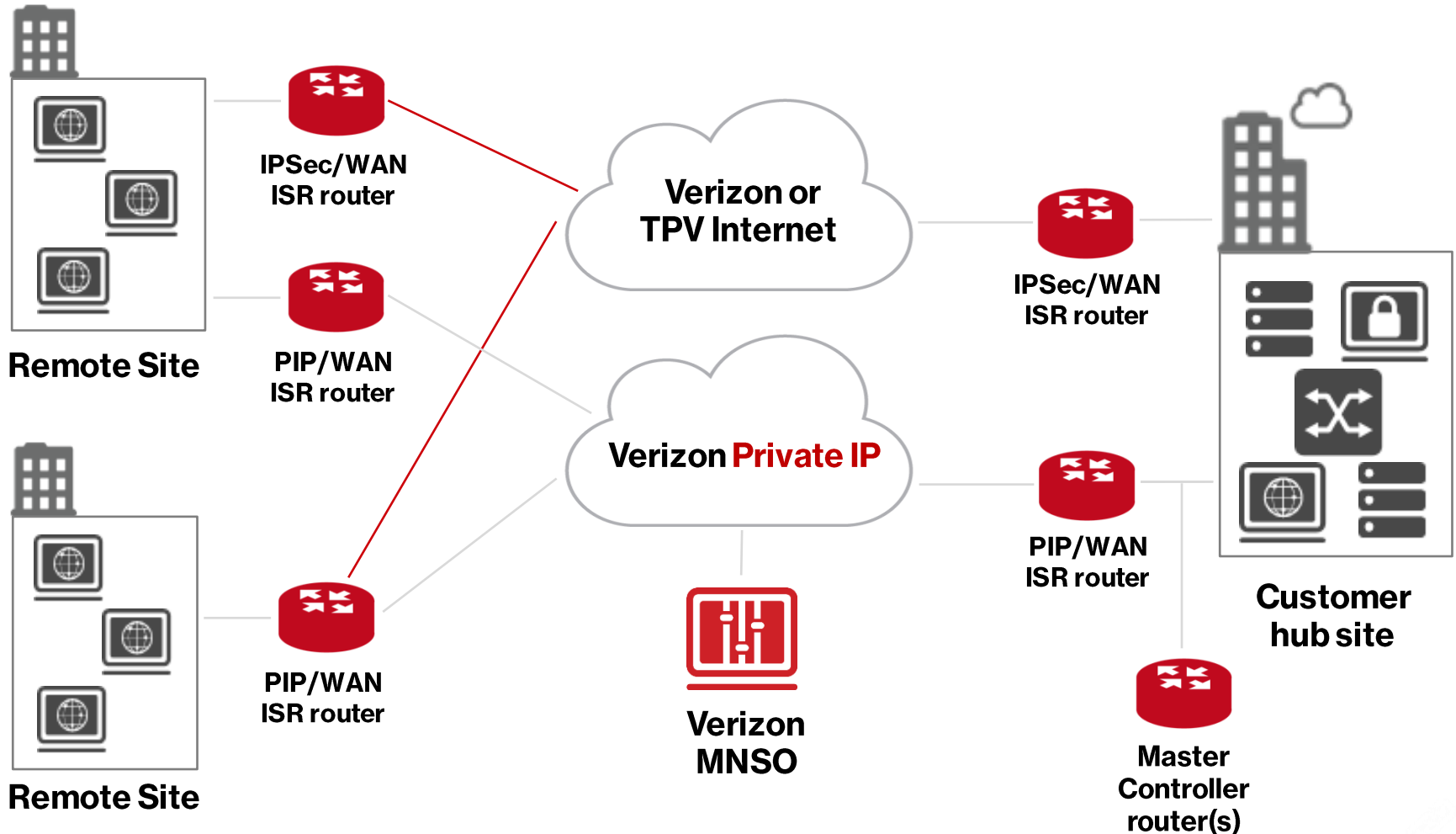
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# PIP / WAN with Versa SD Secure Branch



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# PIP / WAN with Cisco SD WAN



# Viptela SD WAN – Design Overview

- **Main Components for Viptela SD WAN**

- vEdge Routers
  - Hardware devices terminating PIP and Internet circuits
- Bandwidth Licenses for vEdge Routers
  - vSmart license required for each vEdge router deployed in the network
- Managed Services
  - “SD WAN” management feature with bundled license

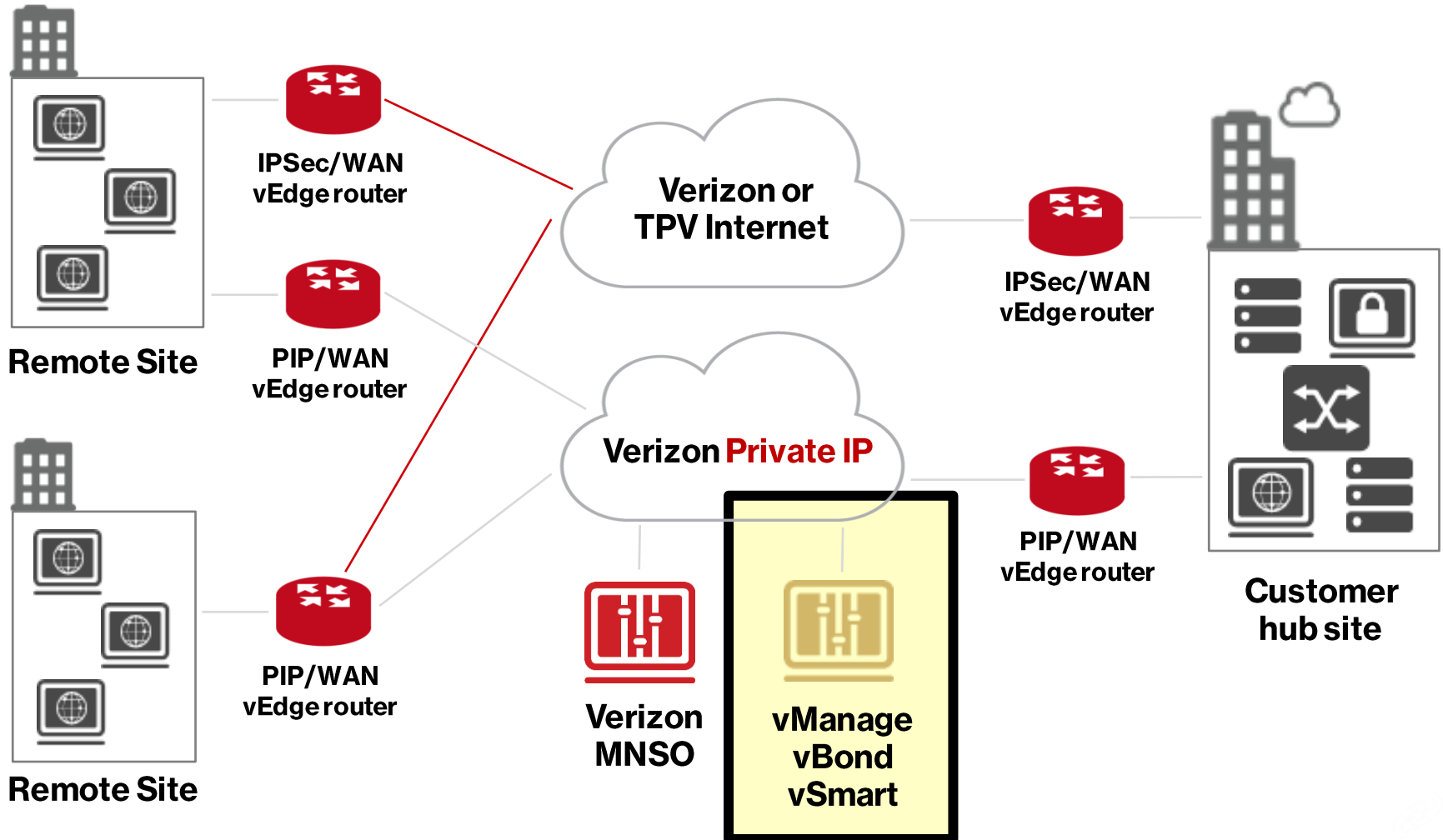
- **Management Controllers (vManage, vSmart, vBond)**
  - Hosted in the network (customer or Verizon hosted)
  - Used for provisioning, operations, control, reporting

- **Access/Transport Network Options all BAU**

- Private IP (ethernet only) and Internet Dedicated (ethernet only)
- Verizon or third party Internet broadband services

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# Viptela SD WAN Controllers



# Versa Secure Branch – Design Overview

- **Main Components for Versa Secure Branch**

- Versa “purpose-built” Routers
  - Hardware devices (with FlexVNF software pre-loaded) terminating PIP and Internet circuits
- Bandwidth Licenses for Versa Routers
  - Versa license required for each Versa router deployed in the network
  - SD WAN and SD WAN + Security license options available
- Managed Services
  - “SD WAN” management feature with bundled license

- **Management Controllers (Versa Director)**
  - Hosted in the network (Verizon hosted)
  - Used for provisioning, operations, control, reporting

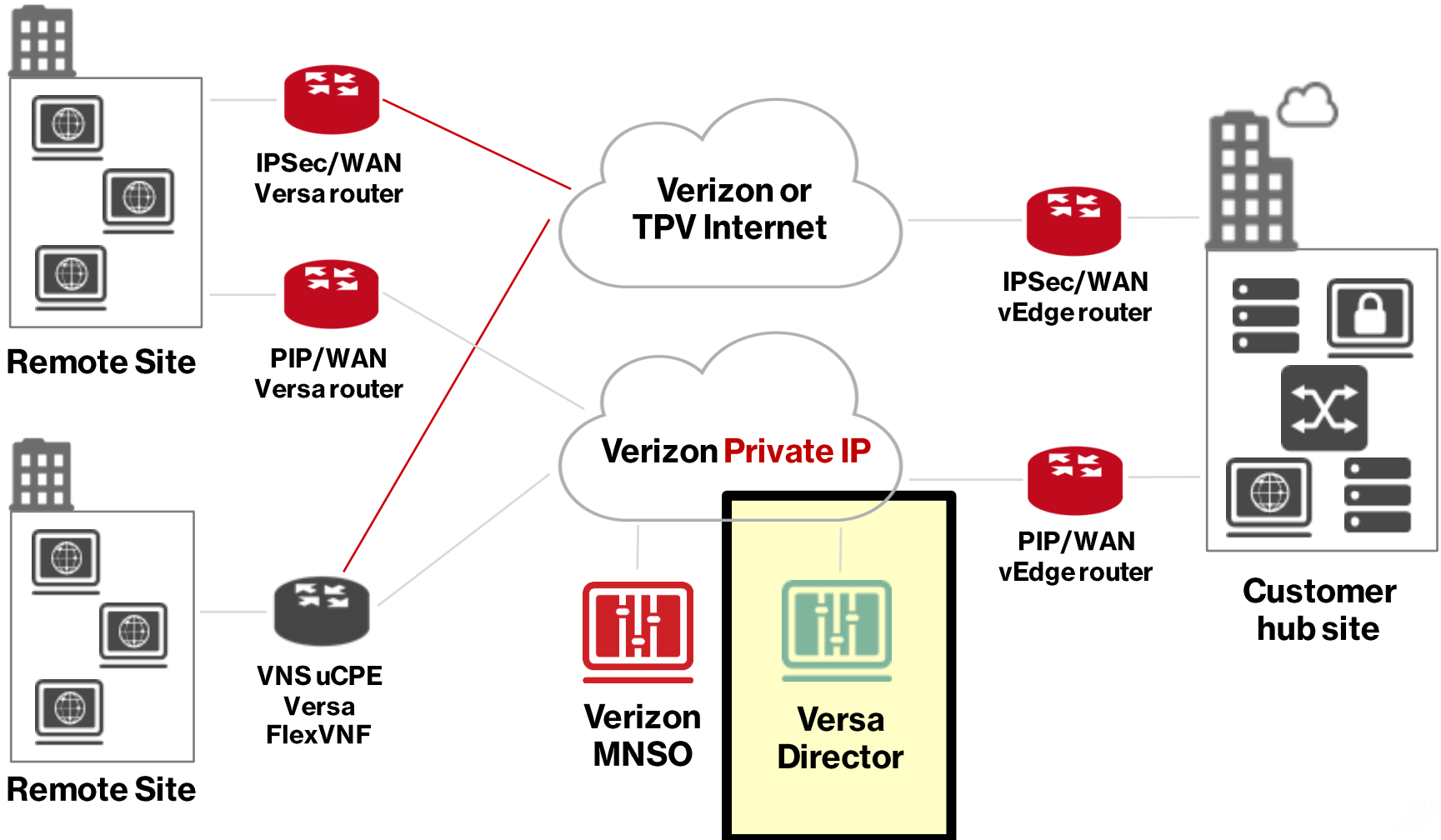
- **Access/Transport Network Options all BAU**

- Private IP (ethernet only) and Internet Dedicated (ethernet only)
- Verizon or third party Internet broadband services



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# PIP / WAN with Versa SD Secure Branch

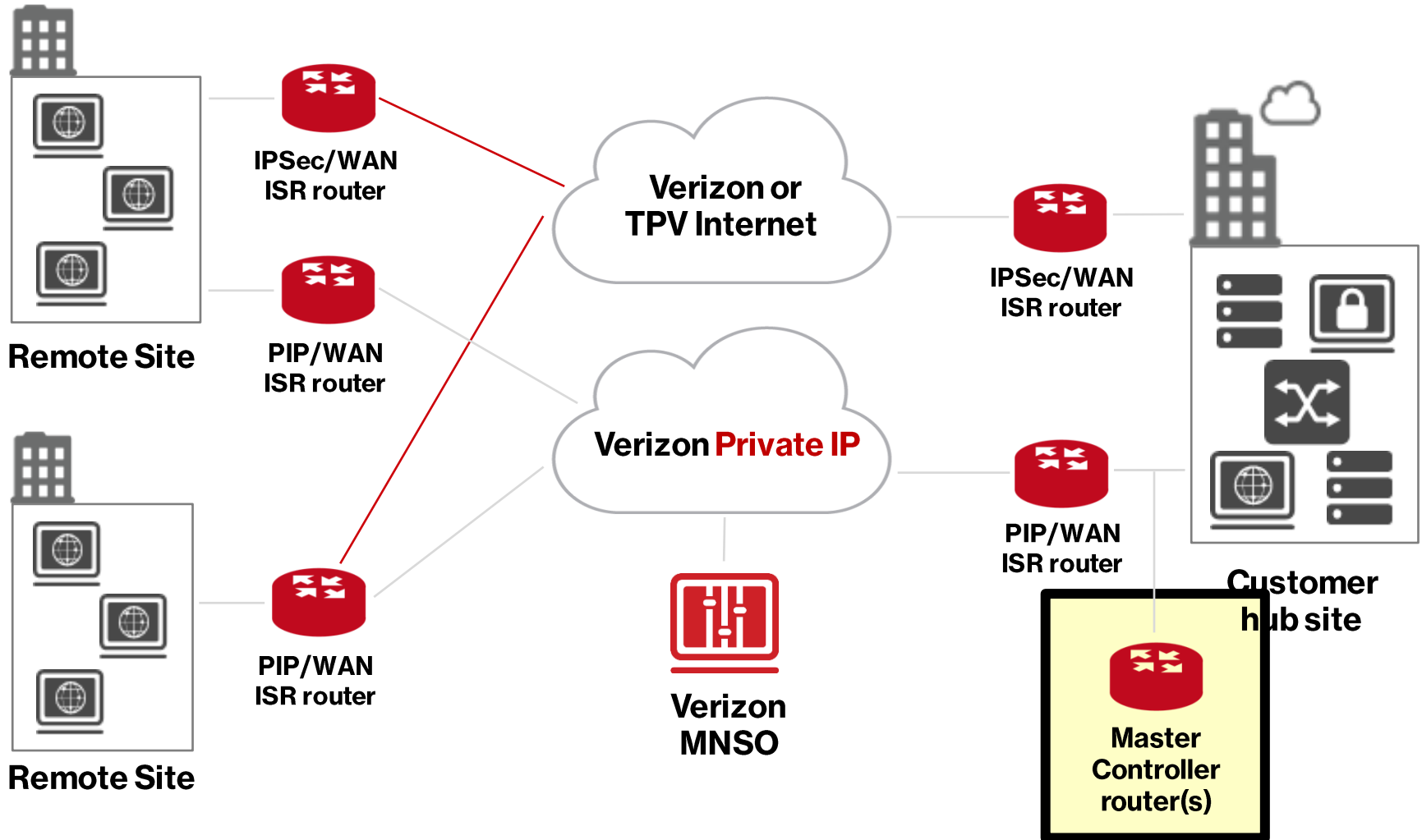


# Cisco SD WAN – Design Overview

- **Main Components for Cisco SD WAN**
  - ISR Routers (e.g. ISR4xxx)
    - Hardware routers terminating PIP and Internet circuits
    - vSmart license required for each vEdge router deployed in the network
  - Managed Services
    - Router management + AAR feature
    - MWAN optional features available for selection as needed
  - **Management Controllers (“Master Controllers”)**
    - Additional ISR routers (1 or 2) hosted at the customer hub site
    - Require MWAN + AAR features on each ISR router
- **Access/Transport Network Options all BAU**
  - Private IP (ethernet only) and Internet Dedicated (ethernet only)
  - Verizon or third party Internet broadband services

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# Cisco SD WAN – Master Controllers



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## Viptela SD WAN – Routers and Licenses

- **Three Primary Devices for Viptela SD WAN**
  - vEdge-100 Router
    - Low end device for remote locations, up to 100Mb bandwidth support
  - vEdge-1000 Router
    - Middle range device for remotes or hubs, up to 1Gb bandwidth support
  - vEdge-2000 Router
    - High end device for customer hubs, up to 10Gb bandwidth support
- **vSmart Bandwidth Licenses for vEdge Routers**
  - One vSmart bandwidth license is required for each vEdge router deployed
  - “Pro” and “Plus” licenses available (“Pro” license is recommended)
  - Licenses support bandwidths ranging from 10Mb to 10Gb
  - Not all vSmart licenses work on every vEdge device

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## Versa Solution – Routers and Licenses

- **Purpose-built Devices for Versa SD Secure Branch (MWAN version)**
  - Advantech Device/Router
    - “x86” device, same device types as used for VNS
    - Versa FlexVNF software pre-loaded on device (no other VNF supported)
    - Future options for LTE and WiFi support
  - Other CPE devices will be added in the future
    - All devices offered will include FlexVNF software pre-loaded on the device
- **“White Box” uCPE Devices for Versa SD Secure Branch (VNS version)**
  - Dell uCPE (standard options for VNS)
    - “x86” devices, available to support Versa FlexVNF and other VNF
- **Versa Licenses for Purpose-built Routers and uCPE Devices**
  - One Versa bandwidth license is required for each device deployed
  - “SD WAN” and “SD WAN + UTM” licenses available (see following slide)
  - Licenses support bandwidths ranging from 10Mb to 10Gb

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## **Software Defined Secure Branch: SD WAN + Security**

**Versa provides multiple license options to support a variety of SD WAN and security functions**

**Versa license options are shown below**

**Verizon is using a subset of Versa licenses for the VNS / MWAN service**

- VNS “Essential”:** Includes Versa Standard SD WAN License
- VNS “Core”:** Includes Versa Standard SD WAN + UTM License
- VNS “Complete”:** Includes Versa Advanced SD WAN + UTM License

**UTM (security) functions will be managed based on VNS level selected**

**For Managed WAN service, customer can choose from same list of licenses**

**Refer to Versa Playbook and Service Description for more details on management of security functions**

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## Cisco SD WAN – Routers and Licenses

- **Primary Devices for Cisco SD WAN**

- ISR4xxx Routers
  - “Preferred” router for SD WAN implementations
- ISR G2 Routers
  - Can support SD WAN functions such as DM VPN and PfR (iWAN)
- ASR1xxx Routers
  - High end devices for customer hubs to support large bandwidths

- **Router Licenses for Cisco Routers**

- SD WAN support for Cisco ISR routers requires APPX license for each router deployed
- SD WAN support for Cisco ISR routers requires SEC license for each router deployed
- Licenses for low end devices (8xx) and large devices (ASR) are similar
- Master Controller routers have same license requirements

# Viptela vs. Versa vs. Cisco Product – MWAN Support

## Viptela, Versa, and Cisco SD WAN are Quoted/Ordered Different

- “Viptela” – vEdge router sold via CPE, with MWAN (license + mgmt.) bundle
- “Versa” – Versa purpose-built device sold via CPE, with MWAN (license + mgmt.) bundle
- “Cisco” – ISR router and licenses sold via CPE, with management provided BAU

## Managed SD WAN “Bundle” for Viptela

- Single charge MRC & NRC that covers (charges vary by license level)
  - Managed WAN full device management
  - **Default feature for Viptela is SD WAN Management**
  - Viptela license installed on vEdge, vEdge CPE hardware priced separately

## Managed Software Defined Secure Branch “Bundle” for Versa

- Single charge MRC & NRC that covers (charges vary by license level)
  - Managed WAN full device management
  - **Default feature for Versa is Software Defined Secure Branch**
  - Versa license installed on Versa CPE router, CPE hardware priced separately

## Managed SD WAN for Cisco

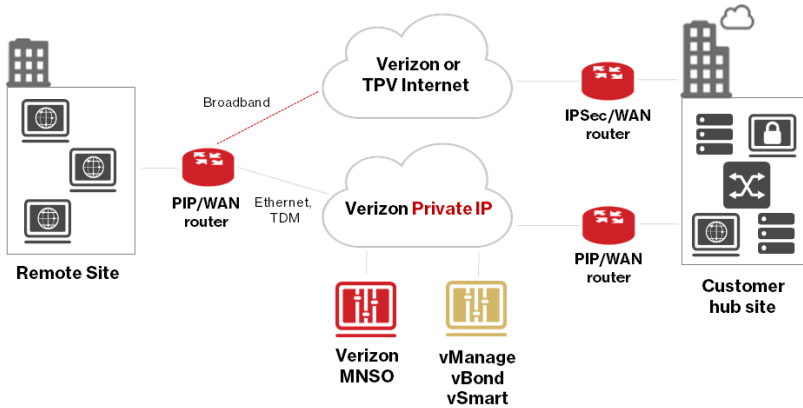
- Managed WAN full router management + AAR feature
- ISR router with appropriate license installed, CPE priced separately



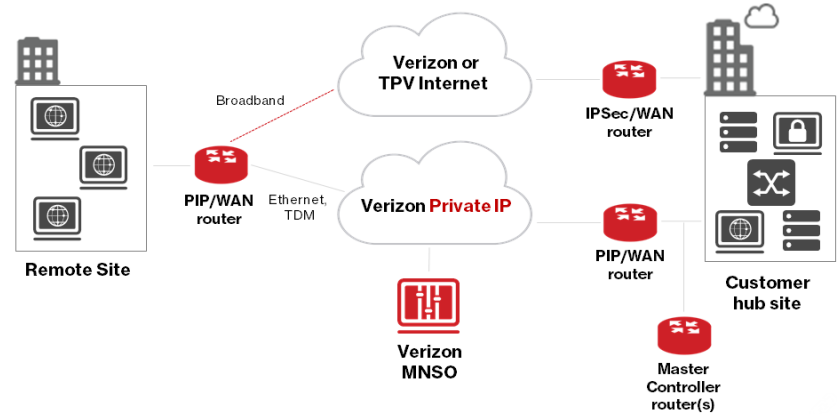
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## Quoting Viptela and Versa is Different from Cisco !!!

### PIP / WAN with Viptela SD WAN (1 router remote)



### PIP / WAN with Cisco iWAN (1 router remote)



### For Viptela:

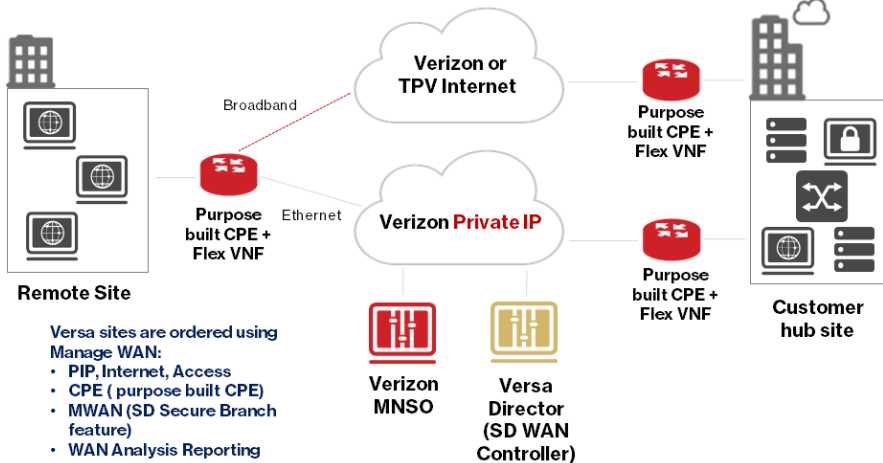
- Master Controllers not required
- vEdge devices quoted as CPE
- vSmart licenses ordered as part of Managed WAN bundle
- Managed WAN -> SD WAN Management
- vManage/vBond/vSmart not quoted
- PIP, Internet, Access services all quoted as BAU

### For Cisco:

- Master Controllers required at customer hub
- ISR routers quoted as CPE
- APPX licenses ordered as part of CPE
- Managed WAN -> Router Management + AAR Feature
- PIP, Internet, Access services all quoted as BAU

# Quoting Viptela and Versa is Different from Cisco !!!

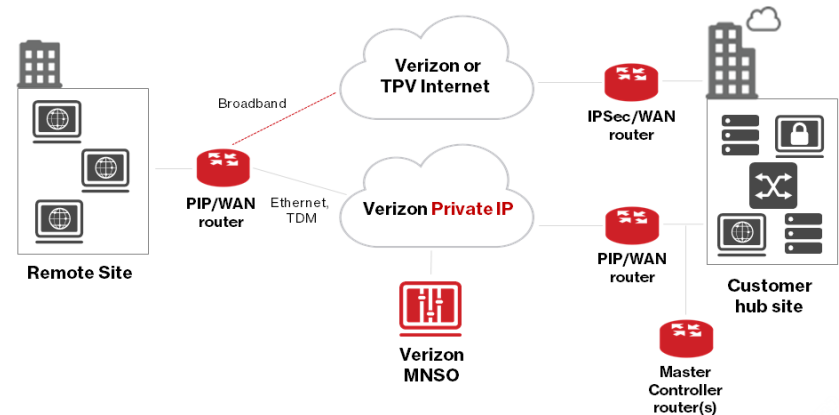
## Versa Solution Using MWAN (1 router remote)



## For Versa:

- Master Controllers not required
- Versa devices quoted as CPE
- Versa licenses ordered as part of Managed WAN bundle
- Managed WAN -> SD Secure Branch
- Versa Director not quoted or ordered
- PIP, Internet, Access services all quoted as BAU

## PIP / WAN with Cisco iWAN (1 router remote)



## For Cisco:

- Master Controllers required at customer hub
- ISR routers quoted as CPE
- APPX licenses ordered as part of CPE
- Managed WAN -> Router Management + AAR Feature
- PIP, Internet, Access services all quoted as BAU

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## Application Aware Routing Comparison 1

Aspect	Cisco IWAN	Viptela
<b>WAN Path Control</b>	<ul style="list-style-type: none"> <li>• per application flow</li> <li>• fast, low artificial traffic but resource intensive</li> </ul>	<ul style="list-style-type: none"> <li>• per application flow</li> <li>• simpler implementation</li> </ul>
<b>VPN</b>	<ul style="list-style-type: none"> <li>• IPSec (DM VPN)</li> </ul>	<ul style="list-style-type: none"> <li>• IPSec (zero maintenance)</li> </ul>
<b>Firewall</b>	<ul style="list-style-type: none"> <li>• Zone based firewall or external firewall</li> </ul>	<ul style="list-style-type: none"> <li>• ACL or external firewall</li> </ul>
<b>Configuration</b>	<ul style="list-style-type: none"> <li>• per AAR device</li> <li>• more complex, as a portfolio of technologies need to be brought together</li> </ul>	<ul style="list-style-type: none"> <li>• per SD WAN device</li> <li>• central configuration and control via vManage</li> </ul>
<b>Performance Optimization</b>	<ul style="list-style-type: none"> <li>• Cisco WAAS add-on</li> <li>• Akamai Connect add-on</li> </ul>	<ul style="list-style-type: none"> <li>• via external function</li> <li>• via network architecture</li> </ul>
<b>Segmentation</b>	<ul style="list-style-type: none"> <li>• per VRF configured</li> </ul>	<ul style="list-style-type: none"> <li>• automatic per application</li> </ul>
<b>Reporting</b>	<ul style="list-style-type: none"> <li>• WAN Analysis for standard reporting</li> <li>• Separate AAR reporting available (SevOne0)</li> </ul>	<ul style="list-style-type: none"> <li>• WAN Analysis for standard reporting</li> <li>• Separate AAR reporting available (SevOne)</li> </ul>

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## Application Aware Routing Comparison 1

Aspect	Cisco I WAN	Viptela
<b>Cisco-Centric Expertise/Support Needed</b>	<ul style="list-style-type: none"> <li>• Yes</li> </ul>	<ul style="list-style-type: none"> <li>• no</li> </ul>
<b>Centralized Controllers</b>	<ul style="list-style-type: none"> <li>• Master Controller routers required at customer hub (1 or 2)</li> <li>• requires ISR44xx or higher</li> </ul>	<ul style="list-style-type: none"> <li>• yes – redundant vManage controllers</li> <li>• Verizon hosted option (VCP)</li> </ul>
<b>Secure Tunnel</b>	<ul style="list-style-type: none"> <li>• DM VPN w IPsec</li> </ul>	<ul style="list-style-type: none"> <li>• IPsec – vEdge to vEdge</li> <li>• DTLS – controller traffic</li> </ul>
<b>Zero Touch Provisioning</b>	<ul style="list-style-type: none"> <li>• hub routers require no additional config when new remote sites are added</li> </ul>	<ul style="list-style-type: none"> <li>• future enhancement</li> </ul>
<b>Leveraging Existing CPE</b>	<ul style="list-style-type: none"> <li>• possible to use existing ISR</li> <li>• ISR G2 and ISR4k routers recommended, with APPX and SEC license</li> </ul>	<ul style="list-style-type: none"> <li>• new vEdge routers required for Viptela SD WAN</li> <li>• integration with existing Cisco routers supported</li> <li>• uCPE options as part of VNS also available</li> </ul>
<b>Over The Top Tunnel Routing Protocol</b>	<ul style="list-style-type: none"> <li>• BGP or EIGRP</li> </ul>	<ul style="list-style-type: none"> <li>• OMP (Proprietary)</li> </ul>

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## Application Aware Routing Comparison 2

Aspect	Cisco IWAN	Versa
<b>WAN Path Control</b>	<ul style="list-style-type: none"> <li>• per application flow</li> <li>• fast, low artificial traffic but resource intensive</li> </ul>	<ul style="list-style-type: none"> <li>• per application flow</li> <li>• simpler implementation</li> </ul>
<b>VPN</b>	<ul style="list-style-type: none"> <li>• IPSec (DM VPN)</li> </ul>	<ul style="list-style-type: none"> <li>• IPSec</li> </ul>
<b>Firewall/Security</b>	<ul style="list-style-type: none"> <li>• Zone based firewall or external firewall</li> </ul>	<ul style="list-style-type: none"> <li>• Firewall support part of UTM license</li> <li>• Additional UTM functions supported</li> </ul>
<b>Configuration</b>	<ul style="list-style-type: none"> <li>• per AAR device</li> <li>• more complex, as a portfolio of technologies need to be brought together</li> </ul>	<ul style="list-style-type: none"> <li>• per SD WAN device</li> <li>• central configuration and control via Versa Director</li> </ul>
<b>Performance Optimization</b>	<ul style="list-style-type: none"> <li>• Cisco WAAS add-on</li> <li>• Akamai Connect add-on</li> </ul>	<ul style="list-style-type: none"> <li>• via external function</li> <li>• via network architecture</li> </ul>
<b>Segmentation</b>	<ul style="list-style-type: none"> <li>• per VRF configured</li> </ul>	<ul style="list-style-type: none"> <li>• automatic per application</li> </ul>
<b>Reporting</b>	<ul style="list-style-type: none"> <li>• WAN Analysis for standard reporting</li> <li>• AAR reporting via SevOne</li> </ul>	<ul style="list-style-type: none"> <li>• WAN Analysis for standard reporting</li> <li>• AAR reporting via SevOne</li> </ul>

# Application Aware Routing Comparison 2

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<b>Secure Tunnel</b>	<ul style="list-style-type: none"> <li>• DM VPN w IPSec</li> </ul>	<ul style="list-style-type: none"> <li>• IPSec – FlexVNF to flex VNF</li> </ul>
<b>Zero Touch Provisioning</b>	<ul style="list-style-type: none"> <li>• hub routers require no additional config when new remote sites are added</li> </ul>	<ul style="list-style-type: none"> <li>• future enhancement</li> </ul>
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<b>Over The Top Tunnel Routing Protocol</b>	<ul style="list-style-type: none"> <li>• BGP or EIGRP</li> </ul>	<ul style="list-style-type: none"> <li>• BGP</li> </ul>

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**Article from TechTarget is inserted below. They did a high level comparison of Viptela vs. Cisco SD WAN solutions.**



### SD WAN Comparison