

Huawei CloudWAN Solution Brochure

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Trends and Challenges Faced by Enterprise Networks

Enterprise IT architecture is continuously transforming towards the cloud architecture, and public clouds such as Amazon Web Services (AWS) are emerging and becoming widely used. This drives infrastructures such as enterprise data centers to move to the cloud. More and more enterprises begin to use public clouds, making the network architecture of enterprises more open. At the same time, key applications of enterprises gradually migrate to the cloud. Relying on SaaS (such as Office 365, production ERP system, and Salesforce) provided by application service providers, an increasing number of enterprises access key office applications from the cloud through the Internet.

Cloudification represents both a technical revolution and business model transformation. Enterprises face many challenges as branch services migrate to the cloud.

- **Traditional Leased Lines Are Expensive, so Cost-Effective and Efficient Link Resources Are Required to Meet Requirements of Increasing WAN Traffic**

As enterprise networks frequently interact with cloud data centers, high network bandwidth is essential. Traditionally, enterprises use carriers' Multiprotocol Label Switching (MPLS) leased lines for WAN interconnection. Although this method guarantees network quality, it requires enterprises to spend a great deal on MPLS leased lines, which accounts for more than 50 percent of enterprises' Operating Expense (OPEX).

- **Unstable Applications: Numerous Applications Share Bandwidth and Services Conflict, Leading to Poor User Experience**

Enterprises' numerous applications share the bandwidth, the cloud traffic is diverted through the headquarters, and the primary link is congested during peak hours, resulting in poor experience of key services. In addition, the backup links are idle, resulting in less than 40% bandwidth utilization.

- **Long Service Provisioning Process: Traditional Methods Cannot Meet Requirements for Flexible Service Deployment**

On traditional leased lines, the provisioning of new services requires multiple tasks, such as in-store application, service provisioning, and onsite configuration — the service provisioning alone usually takes from one month to three months. As cloud-based transformation progresses, enterprises update services more rapidly. Current networks cannot meet requirements for fast service provisioning.

- **Network O&M Difficulties: Invisible Service Traffic and Low O&M Efficiency**

Traditional leased lines require onsite device maintenance by dedicated personnel. Enterprises that have branches in many locations and a large number of devices deployed may find it difficult and expensive to maintain the branch networks. Additionally, as services expand and become cloud-based, WAN traffic between the headquarters, branches, public clouds, and private clouds becomes more complex. Traditional network O&M methods cannot adapt well to service development.

Huawei's next-generation NetEngine AR6000/AR600 series enterprise routers use ARM multi-core processors and a non-blocking switching structure, helping to deliver four times the industry average performance. The NetEngine AR6000/AR600

series also integrates functions such as SD-WAN, cloud management, routing, switching, VPN, security, and MPLS, ensuring diversified and cloud-based services are fully supported.

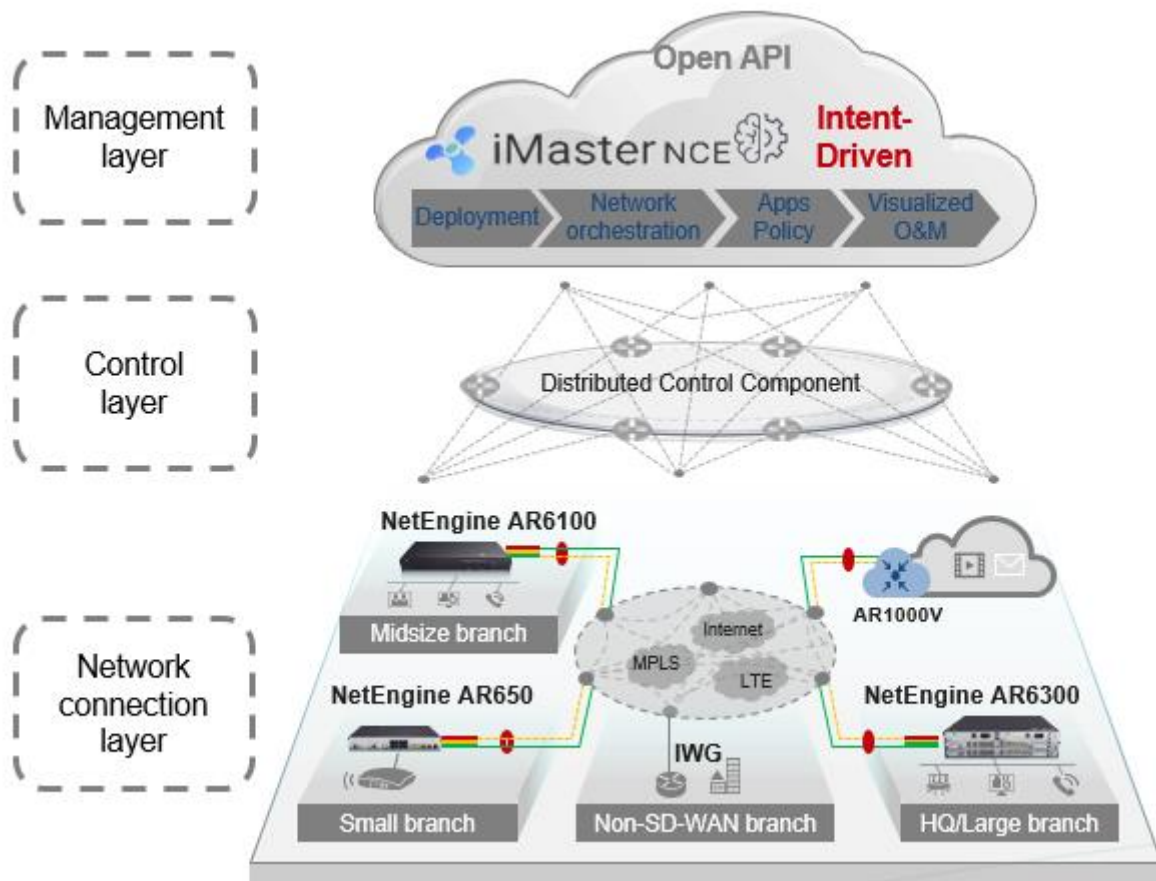
Huawei CloudWAN Solution

Huawei provides a CloudWAN solution to solve enterprise network problems, including high cost, low bandwidth utilization, poor experience, slow deployment, and difficult O&M. Huawei CloudWAN Solution provides on-demand interconnection between branches; between branches and data centers; and between branches and the cloud. To deliver assured service experience, the solution re-architects the end-to-end service handling on enterprise leased lines through application-based intelligent traffic steering, bandwidth utilization-based traffic steering, intelligent acceleration, on-demand value-added services (VASs), and intelligent O&M.

Architecture of Huawei CloudWAN Solution

Huawei CloudWAN Solution architecture includes the network connection layer, control layer, cloud management platform, and application layer.

Architecture of Huawei CloudWAN Solution



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- **Network connection layer**

The solution uses links that include the Internet and traditional leased lines to provide interconnection between enterprise headquarters, branches, public clouds, and private clouds. This layer includes cost-effective devices such as customer premises equipment (CPE), and virtual CPEs (vCPEs), as well as Huawei SDN overlay technology to achieve on-demand network-wide connections.

The CloudWAN solution employs Huawei's high-performance NetEngine AR6000/AR600 series routers to deliver performance three times the industry average. These CloudWAN routers have built-in hardware acceleration, use the Ultra-Fast forwarding algorithm, and process services from Layer 3 to 7.

- **Control layer**

The RR works with the Agile Controller to implement automatic network deployment and configuration, automatic policy delivery, inter-site routing information transmission, and inter-zone network interconnection and interoperability.

- **Management platform layer**

The solution uses the iMaster NCE controller to manage the entire process of providing enterprise interconnection services. The controller provides southbound NETCONF/YANG interfaces to centrally manage devices such as the RR, CPEs, and vCPEs. This helps achieve mapping from CPEs to the RR, VPN network topology configuration and orchestration, and network service policy management and delivery. The Agile Controller also provides northbound standard RESTful interfaces to interconnect with third-party applications and cloud platforms. The solution support cloud management based on Huawei Cloud Service and the jointly-operated cloud.

Characteristics of Huawei CloudWAN Solution

This solution has the following characteristics:

- **Powerful NetEngine AR with CPU + NP heterogeneous forwarding, excellent performance**

CPU + NP heterogeneous forwarding and ultra-fast algorithm, deliver 3-times higher SD-WAN performance than the industry average and implement multi-cloud and multi-network interconnection on demand. This meets enterprises' soaring bandwidth requirements.

- **Application optimization, better experience**

Provides abundant application identification technologies (FPI and DPI) to implement quick and accurate identification of well-known applications and identification of special industry applications based on user-defined applications through 5 Tuple, DSCP and URL.

NetEngine AR routers focus on application experience and provide application-based intelligent traffic steering and optimization to ensure the experience of key applications. For example, the innovative built-in adaptive forward error correction (A-FEC) *** achieves lossless audio and video experience at 20% packet loss rate.

***note: AR651C and AR610 series don't support A-FEC function.

- **Intent-driven, plug-and-play**

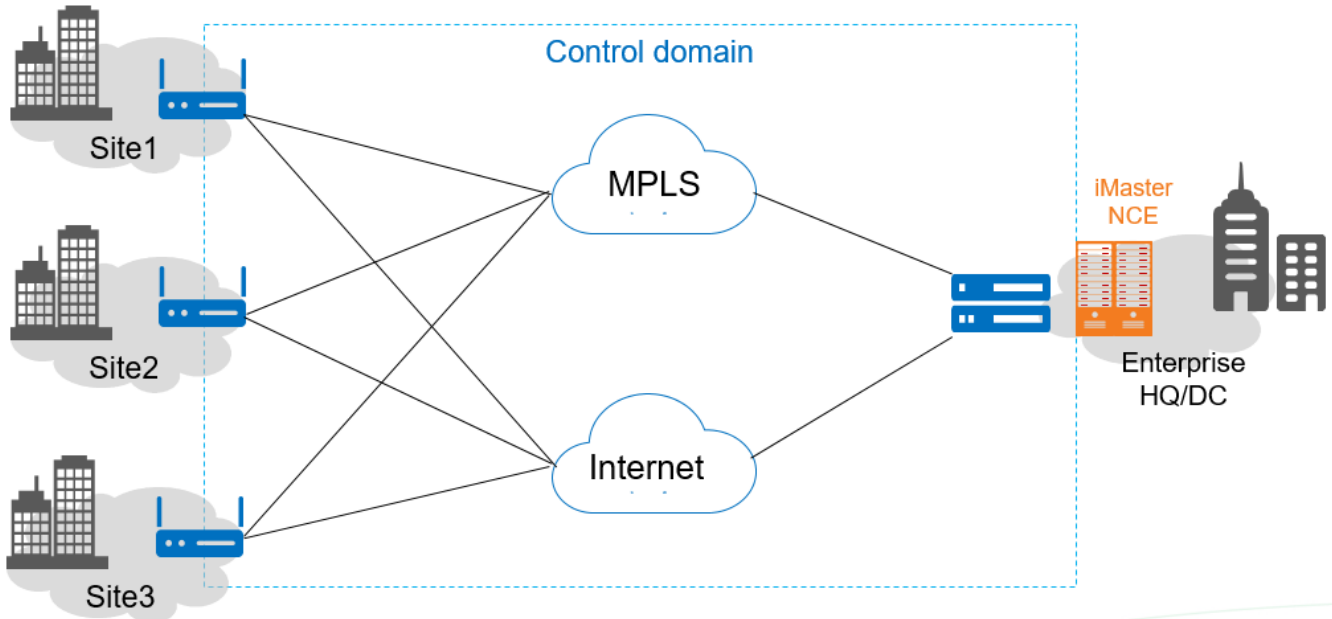
Extensive ZTP modes are provided, making devices plug-and-play and eliminating the need to visit sites.

The intent-driven and application-centric configuration wizard enables an automated process ranging from device deployment, network orchestration, application policy configuration, to visualized O&M, shortening the service configuration time from 30 minutes to 5 minutes.

Application Scenarios of Huawei CloudWAN Solution

Enterprise-Built CloudWAN Interconnection

In Huawei's enterprise CloudWAN solution, an independent iMaster NCE is deployed locally, as shown in Figure 2, to enable the enterprise to manage its own CloudWAN services.



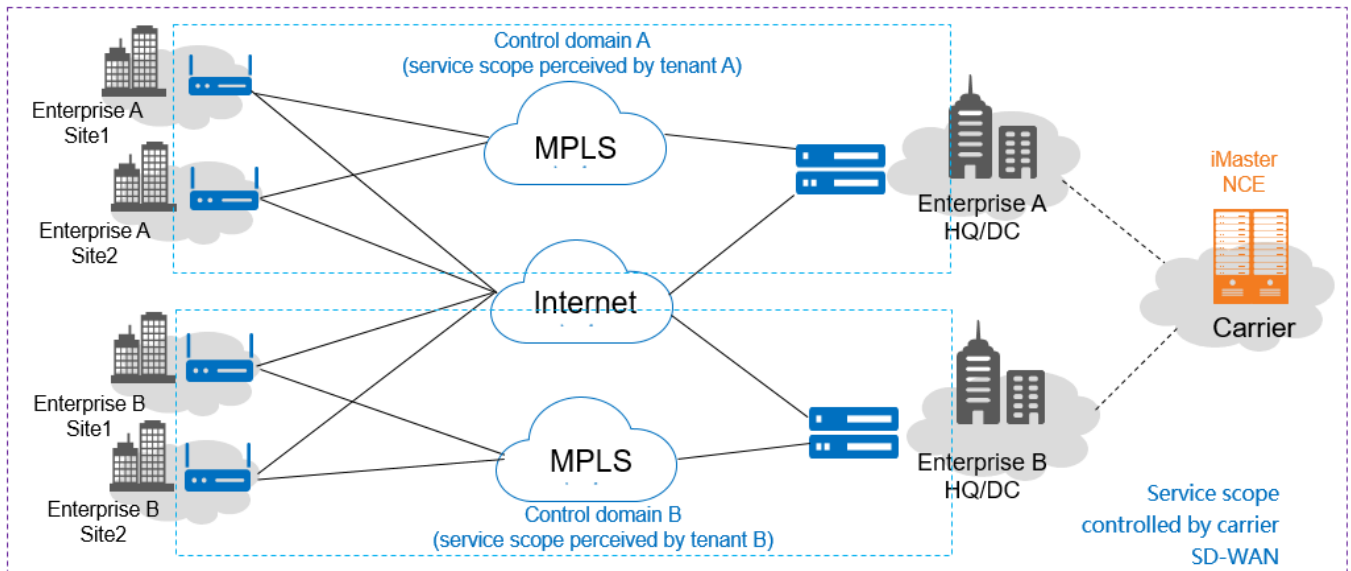
Carrier CloudWAN Supporting Multiple Tenants

In Huawei's carrier CloudWAN solution, the carrier provides the Agile Controller as a unified management and control component to offer CloudWAN services to multiple enterprises. Each enterprise is a tenant of the management and control component, and each enterprise can manage the CloudWAN services of every site within their scope.

Provide two types of hierarchical account architecture: system administrator + MSP + tenant and system administrator + tenant.

The IWG provides tenants with the interoperability of SD-WAN domains with traditional network domains.

Carrier CloudWAN supporting multiple tenants



Huawei CloudWAN Solution Products

The main products in Huawei CloudWAN Solution are the iMaster NCE, RR, CPE, and vCPE.

The following table describes functions of each component in Huawei CloudWAN Solution.

Component	Product	Function Description
Controller	iMaster NCE	Centralized and automatic management of network devices
Distributed control component	RR	Distributes VPN routing and tunnel information between CPEs
CPE	Traditional CPE such as NetEngine AR6000/AR600 series	NetEngine AR supporting evolution toward SD-WAN
vCPE	AR1000V	Can be installed on VMs or independent servers for interconnection between branches and hub nodes, or between branches and services on the cloud

More Information


For more information about Huawei next-generation AR enterprise routers, visit <http://e.huawei.com> or contact us in the following ways:

- Global service hotline: <http://e.huawei.com/en/service-hotline>
- Logging in to the Huawei Enterprise technical support website: <http://support.huawei.com/enterprise/>
- Sending an email to the customer service mailbox: support_e@huawei.com

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