



Huawei WAN Interconnection Solution: Overcoming Network Development Challenges

WAN Interconnection Trends and Challenges

IT and digital technologies are quickly being applied to the enterprise, as broadband and multi-service support development for enterprise networks continue to trend upward. Fixed infrastructure network construction has boomed in recent years. According to OVUM, the 2012 global WAN market will reach US\$8.2 billion, of which a market share of US\$3.5 billion is potentially available to Huawei and their channel partners.

Distance/Capacity Challenges



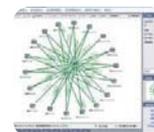
- Long-distance transmission is hindered by extreme interference.
- Continuous network capacity expansion raises costs.
- Energy consumption and costs skyrocket.

Obstacles to Reliability



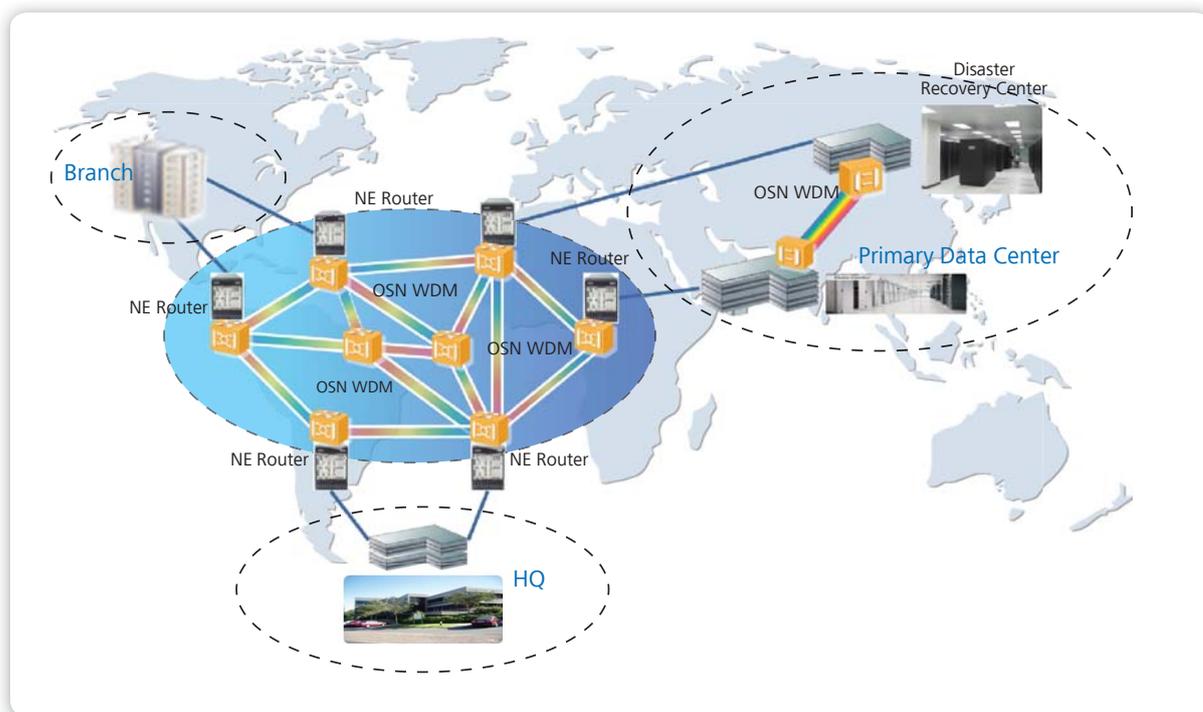
- 200 ms service switchover fails requirements for high reliability.
- Hierarchical protection wastes resources.
- Protection effectiveness cannot be ensured.

O&M Inefficiencies



- Lack of a unified NMS hampers operation and maintenance.
- Massive alarms result in slow system recovery from faults.
- Inefficient fault locating results in many incorrect dispatches.

Huawei WAN Interconnection Solution

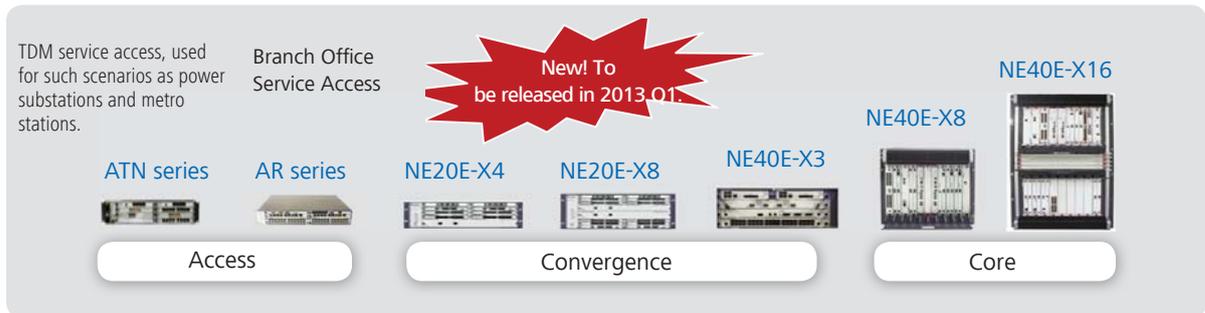
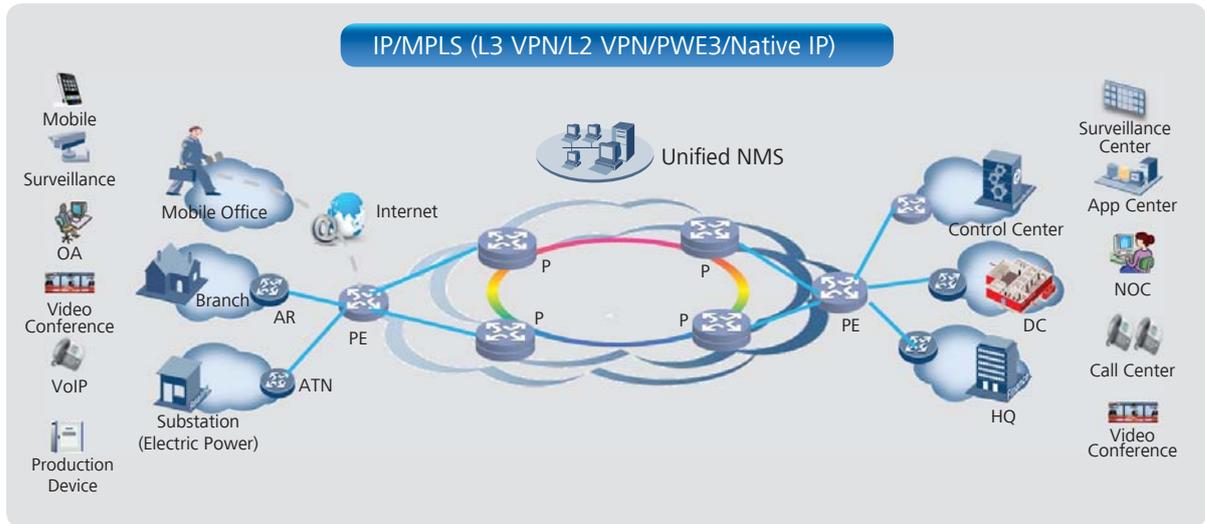


WAN Interconnection Solutions and Huawei Opportunities

Solution	Description	Huawei Opportunities
IP/MPLS Backbone Network Solution	IP technologies are growing in popularity around the world, driving a large number of IP/MPLS networks to be built worldwide. In response, Huawei has released an IP/MPLS Backbone Network Solution. Core routers used in this solution can groom network-wide services in a non-blocking manner.	<ul style="list-style-type: none"> • National IT transformation projects (national broadband projects) • Integrated data network (IDN) projects of the electric power, transportation, and energy industries • Backbone network projects for safe cities, distance education, and distance healthcare • Backbone networks self-built by ISPs
Transport Bearer Network Solution	The worldwide demand for broadband applications is growing, inflating the demand for bandwidth. Huawei's Transport Bearer Network Solution helps build a 7/24 aeroamphibious network using optical fiber and microwave resources.	<ul style="list-style-type: none"> • National IT transformation projects (national broadband projects) • Basic bearer network projects for electric power, transportation, and energy industries • Backbone networks self-built by ISPs • Disaster recovery interconnection projects for the finance industry

IP/MPLS Backbone Network Solution

IP/MPLS Backbone Network Solution Architecture



Solution Highlights

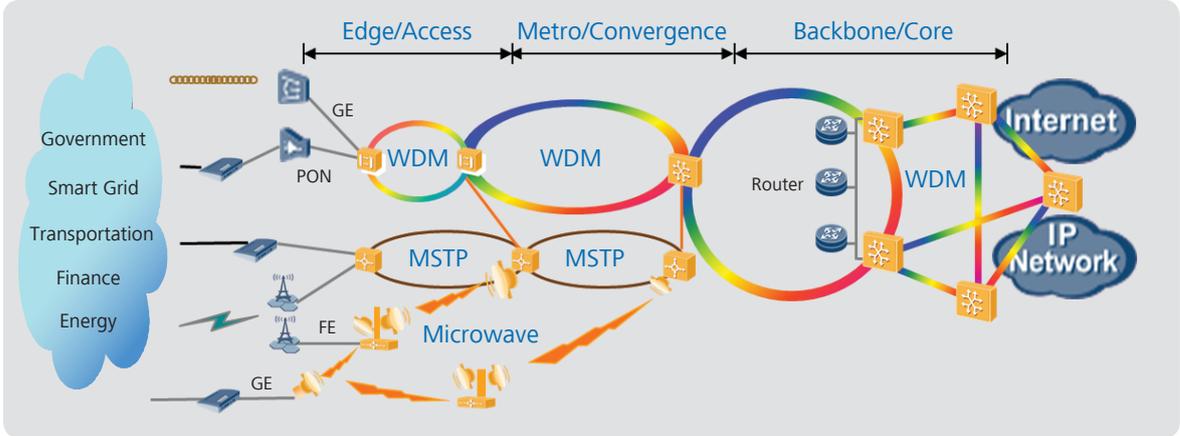
- Supports IP and optical synergy and provides the industry's first end-to-end 100 G solution (which can smoothly scale to 400 G in the future).
- Uses multi-layer reliability technologies to ensure service-always-online and end-to-end service switchover are completed within 50 ms.
- Allows for large-scale deployment of IPv6 networks (helping build the world's largest IPv6 network for China Education and Research Network (CERNET2)).
- Supports Synchronous Digital Hierarchy (SDH)-like pipelines, which are compatible with legacy time division multiplexing (TDM) services and makes for smooth migration of industry-specific networks to all IP networks.
- Uses a unified Versatile Routing Platform (VRP) platform for all products (global shipments of more than 4 million sets) to ensure strong stability and consistent user experience.
- Adopts advanced clock synchronization technologies and supports 1588v2 for hardware, which can be widely applied to electric power and railway industries.

Industry Scenarios

Industry	Trends	Huawei Opportunities
Government/ Education/ Large Enterprise	<ul style="list-style-type: none"> • Emerging countries will incorporate national IT transformation projects (broadband projects) into their national strategies. • Safe cities, distance education, and distance healthcare will be quickly deployed. • Network coverage will grow as globalization and informatization are moving forward worldwide. 	<ul style="list-style-type: none"> • Builds new IP WANs and expands the capacity of existing IP WANs.
Electric Power/ Transportation/Energy	<ul style="list-style-type: none"> • IP technologies are increasingly used worldwide. As a result, more IP backbone networks, which support legacy TDM services features (light load, service-centric and high requirements for latency, protection and OAM) will be constructed around the world. 	<ul style="list-style-type: none"> • TDM network reconstruction • Builds new IP data networks and expands the capacity of existing IP data networks.
Internet Service Provider (ISP)	<ul style="list-style-type: none"> • Market competition is fiercer than ever. To stay ahead of the competition, customers need to quickly distribute multimedia content to the borders of metropolitan area networks (MANs). • Customers will begin to build their own backbone networks rather than continue leasing such networks due to bandwidth requirements and leasing fees. 	<ul style="list-style-type: none"> • Self-built backbone networks (The Agissson has set up a media asset account department to deal with the ISP market.)

Transport Bearer Network Solution

Transport Bearer Network Solution Architecture



Microwave

MSTP/SDH

WDM/OTN

Solution Highlights

Industry-leading WDM Solution

- Greatly facilitates the construction of metro WDM networks through simple connections, without the need for professional planning.
- Uses Photonic Integrated Device (PID) technology for better energy conservation, simpler network structure and higher efficiency.

Continued Microwave Improvement

RTN980

- Maximum 14 directions
- Good catalyst for networkized microwave
- IP-based
- Ease of maintenance
- Easy expansion

Nodal Microwave with the Highest Integration Level in the Industry

Full-Outdoor (FO) Microwave

- Uses the RTN 980 (up to 14 directions and 5 U high) to gain advantages in networkized microwaves.
- Supports FO microwave to meet diversified outdoor deployments.

End-to-End Hybrid Solution

- Combines Hybrid MSTP with Hybrid Microwave to support end-to-end TDM and packet services (1+1 > 2).
- Supports Hybrid Transport, which future-proofs the OTN (1+1+1 > 3).

Industry Scenarios

Industry	Trends	Huawei Opportunities
Government/ Education	<ul style="list-style-type: none"> • Emerging countries will incorporate national IT transformation projects (broadband projects) into their national strategies. 	<ul style="list-style-type: none"> • Builds new backbone networks and expands the capacity of existing backbone networks.
Electric Power/ Transportation/Energy	<ul style="list-style-type: none"> • Traditional TDM services (light load, service-centric, and high requirements for latency, protection and OAM) will exist far into the future. • Simultaneously, video services will grow quickly, requiring more bandwidth resources. 	<ul style="list-style-type: none"> • Builds new production networks, expands the capacity of existing production networks, and reconstructs production networks. • Builds new Office Automation (OA) networks and expands the capacity of existing OA networks.
Internet Service Provider (ISP)	<ul style="list-style-type: none"> • Due to rapidly expanding bandwidth requirements, ISPs tend to build their own backbone networks. 	<ul style="list-style-type: none"> • Backbone networks self-built by ISPs