

HUAWEI ENTERPRISE **A BETTER WAY**

# Huawei Enterprise IP Overview

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# New ICT Era, Pressing Changes...

## Era of Internet




- PC to PC
- IP data switch
- Dumb pipes



**Computing**

X86-based servers cost down to 1/5.




**Storage**

1994 — \$1000 /G  
 1997 — \$100 /G  
 2000 — \$10 /G  
 2004 — \$1 /G  
 2010 — \$0.10/G



**Devices**


2011:  
**3.5 billion** smart devices  
**60 billion** sensors



**Application / Business model**

XaaS:  
 IaaS, PaaS, SaaS

## Era of Cloud Computing + IoT



- **H2H, H2M and M2M**
- **Convergence**
  - Switching
  - Computing
  - Storage
- **Intelligent linkage**
  - Refined information control
  - Smart connection

# Application Change Promoting Network Requirement Evolution



New applications

New requirements



## Multi-service identification

- Application category identification
- Application subcategory identification

## Application-based policy

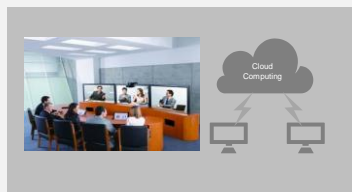
- Application access permission
- Ensured quality of experience for applications

## Enhanced security

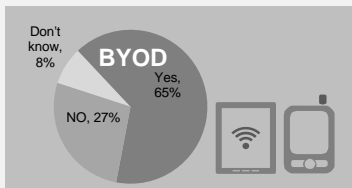
- Secured data transmission
- Resource access control
- Ensured availability of key applications

## Improved performance

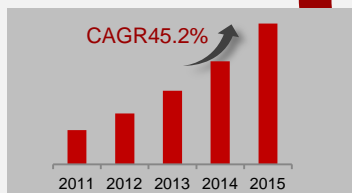
- High bandwidth and short delay
- Concurrent processing capability



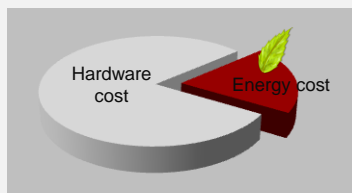
## Cloud and Multimedia



BYOD



10GE



## Energy- conservation

# Chan

- Ease-of-maintenance and high reliability
- Consistent experience across wireless or wired access
- Heavy traffic and frequent traffic bursts
- Energy saving & enterprise responsibility

# HUAWEI Campus Architecture

Connect Everyone, Connect as One

User Experience

Reliable and visualized

Cloud-Ready Campus



Highly Available WLAN Services

Mobile Campus



Fast and Flexible

10GE Campus



Energy Saving

Green Campus



Applicable Scenarios

10GE | Virtualization | Integration of wireless and wireline networks | Telepresence | Desktop cloud | Enterprise voice services | Energy resource management | IPv6 | NAC

Switch

Router

Firewall

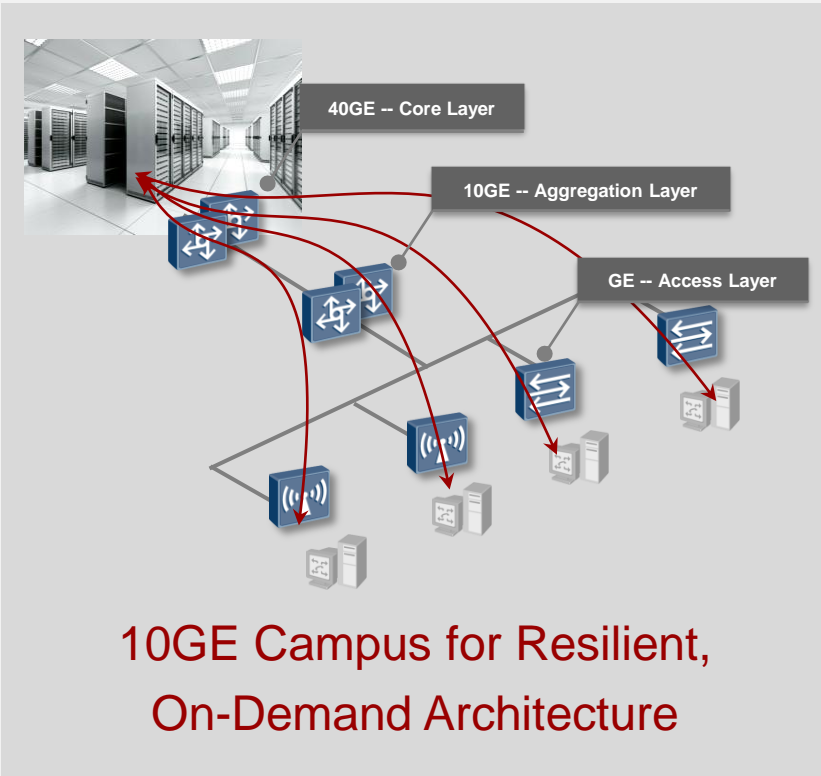
WLAN

Unified NMS

Huawei Products



# 10GE Campus: Fast and Flexible



## Future-proof architecture

Highest capacity, switching capacity to **48Tbps**  
 Non-blocking switching  
 Upgrade path to 100GE

## High-density 10GE and 40GE

Core layer: **288**\*40GE  
 Aggregation layer: **480**\*10GE  
 Access layer: **64**\*GE + **4**\*GE/10GE

**3X** Average

## Most powerful virtualization in industry

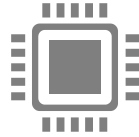
**VS** (Virtual System) + **CSS** (Cluster Switch System) + **iStack**

# Large Capacity & Full Services



Cloud, Video Conference  
Multi-service Converged  
Lack of Network Address

## Large Capacity



Self-developed chips  
**400G/slot** capability  
Meet 5 to 10 years business needs

## Full Service Support



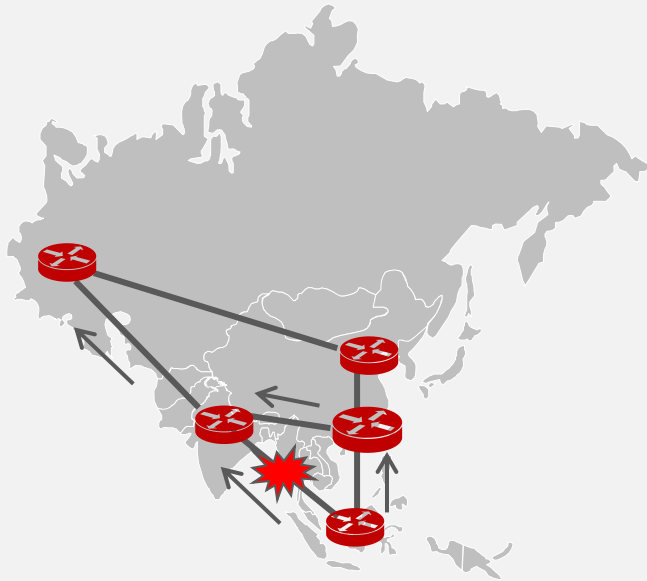
Leading BNG technologies  
Variety of VPN technologies  
Comprehensive enterprise level features:  
GRE, IPsec, NAT, BNG, etc.

## Leading IPv6 Technology

# IPv6

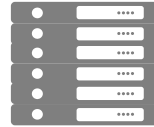
The **1<sup>st</sup>** IPv6 commercial case  
IPv6 Ready Logo Phase-2  
**160G** CGN Card

# High Reliability for Non-stop Business



Important business, involving  
millions of users  
Fault Recovery is too slow

## Device Reliability



All-parts redundancy  
NSR/NSF for everything  
In-service software upgrade

## Link Reliability



Hardware BFD technologies  
BFD for everything  
**3.3ms** Detection time

## Service Reliability



Full FRR technologies  
Huawei patent on VPN/LDP FRR and  
E-VRRP  
< **50ms** fault recovery



# Huawei IP WAN Milestone

**Top 2** IP WAN Solution Supplier in industry

1M+ Routers Shipped

The 1<sup>st</sup> Router of Huawei



1996

The 1<sup>st</sup> NE Router



2000

NE5000E Cluster Router



2004

2006

NE40E-X Service Router



2008

2009

2010

2011

2012.....

NE20E-S Enterprise Router



Self-developed Chips



Solar 1.0  
40G



Solar 2.0  
100G



Solar 3.0  
200G



Member of **15** major standard bodies

Chairs of **10** IETF Working Groups

Published **38 RFCs**, 85 WG drafts

The **2nd** most active router vendor in IETF

**3479** patents filed in IP area.



ME60



NE5000E



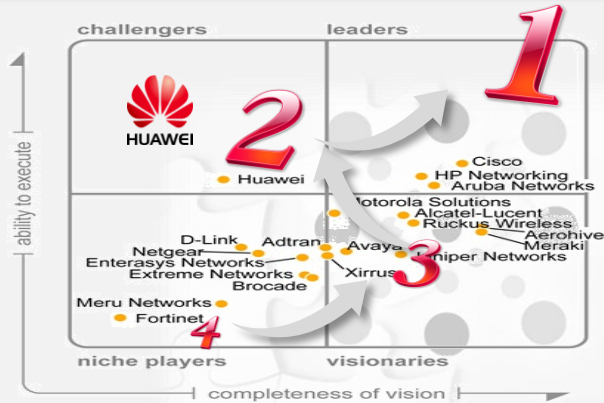
NE40E  
2009 TOP Picks



NE5000E  
200G Linecard

# industry leadership

## Challengers Quadrant in the Magic Quadrant



Huawei has been placed in the **Challengers Quadrant** in the **Magic Quadrant** for the Wired and Wireless LAN Access Infrastructure published 13 June 2012

## Continued to Maintain Market Position

Enterprise Switches No.3



DELL'ORO GROUP

3th

2.8%

From: IDC 2012Q2

Enterprise Switches No.2

Gartner.

2nd

9.2%

From: Gartner 2012Q1

Enterprise router maintain **No.2** in 2012

Enterprise Switches increase to **No.3** in 2013

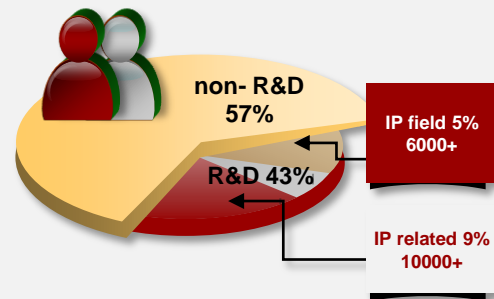
# R&D investment

## 6 R&D bases, global deployment



Enterprise Networking R&D investment is rapidly growing. By the end of September 2011, the number of Enterprise Networking Product Line has reached **3000** employees

By the first half of 2012, Huawei Business of Enterprise input **20,000** employees



# Leading in Standards and Patents



- Members of **15** international organizations for standardization
- **Board members:** IEEE, CCSA, ATIS, BBF, ETSI, OMA, WiMAX Forum
- **180+** important positions in the International Organization for Standardization: IETF, ITU, 3GPP, OMA, ETSI, ATIS, etc.
- **2,100+** standard proposal in the first half of 2012

## Standards and patents

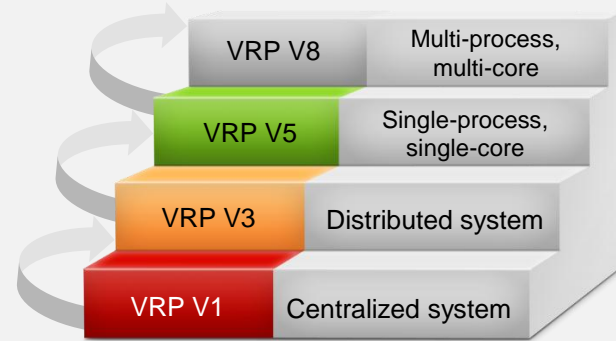
- From the quantities of IETF document, Huawei currently has 429 documents, ranking **NO. 2**, go far beyond Juniper, HP, etc.. In the IP field
- As of June 30, 2012, Huawei has filed a total of 39,209 patent applications in China, 11,314 PCT patent applications and 12,477 patent applications outside of China. A total of 26,539 patent applications have been granted, **90% of which are invention patents**

# Stable Software Platform VRP V8

Applied to **5** Product Families



**18** Years of Experience



Serves **100+** Countries and Regions,  
Stable Operations of **7,000,000+** Devices



**2000+** R&D Engineers Dedicated to Innovation, Active  
Participants in Standardization Organizations



# Complete Enterprise Network Solution

Create Value for Customers

Hand in Hand with Partners, Solution Packaging to Customers

Industry Solution



Government



Enterprise



Energy



Power



Transportation



Finance

Fundamental Solution



Data Center



Campus



Branch



WAN

Standard Application Solution



Datacom Network
















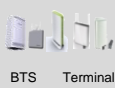

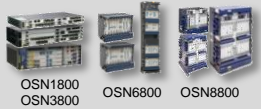




Mobile Network



Transmission Network

# One Net Product Portfolios

<b>Routing &amp; WiFi</b>  <b>Switch</b>  <b>Access &amp; Security &amp; Services Gateway &amp; Wireless</b>  <b>Transmission &amp; Microwave</b>	<b>Access Router AR G3</b>  AR 200/150 AR 1200 AR 2200 AR 3200	<b>Core Router</b>  NE20E-X6 NE40E-X3/X8/X16 NE5000E	<b>WiFi AP</b>  AP6010SN/DN AP6510DN/AP6610DN AP7110DN AP6310SN	<b>WiFi AC</b>  AC6605 ACU For S9700/S7700			
	<b>Date center Switch</b>  CloudEngine 12800 CloudEngine 5800/6800	<b>Core Switch</b>  S9700	<b>10GE Aggregation Switch</b>  S7700 S6700	<b>GE Access Switch</b>  S5700/S5710	<b>FE Access Switch</b>  S3700 S3700POE S2700 S2700POE	<b>SMBSwitch</b>  S1700	
	<b>xPON</b> MxU OLT ONT  MA561x /2x/3x MA5652 /62/69 MA560x/ MA568x HG80x0/ 81xx/82xx	<b>Firewall/UTM</b>  Eudemon 200E/1000E/8000E	<b>SSL VPN</b>  SVN 2000/5000	<b>IDS/IPS</b>  NIP2000/5000	<b>BRAS</b>  ME60 X3/X8/X16	<b>WiMAX</b> BTS Terminal  BTS Terminal	<b>GSM-R</b> DBS 3900  DBS 3900
	<b>WDM</b>  OSN1800 OSN3800 OSN6800 OSN8800	<b>MSTP/Hybrid MSTP</b>  Metro100/1000 OSN 500/550 OSN1500 OSN2500 OSN3500/7500/9560	<b>Microwave</b>  RTN910 RTN950 RTN980				

eSight : Unified Network Management System

# Cloud Fabric Data Center Network Solutions

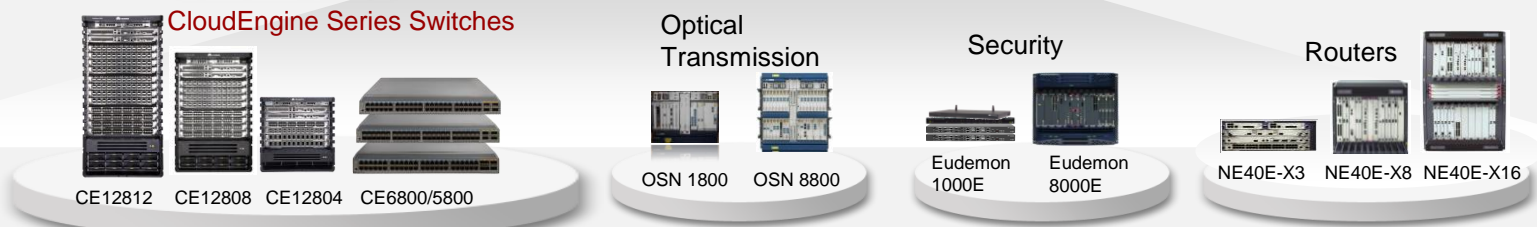
## Cloud Applications



## Network Solution



## Network Devices





# High-performance Core Switches

Back



CE12812



CE12808



CE12804

- High speed line cards: **8 x 100; 24 x 40 GE/96 x 10 GE**
- **1:8 VS** (Virtual System) and **4:1 CSS** (Cluster Switching System) reduce investment
- **TRILL**: 512 nodes Large L2 network
- Dynamic **Clos** architecture; **12GB** large buffer
- **Front-to-rear** air ventilation

	CE12800		Industry
Switching Capacity	48 Tbps	<b>3x</b>	18 Tbps
Bandwidth	2 Tbps	<b>4x</b>	500 Gbps
Line card	1 Tbps	<b>2x</b>	480 Gbps

# 40GE Uplink GE/10GE TOR Switches

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CE6850-48T4Q-EI



CE6850-48S4Q-EI



CE5850-48T4S2Q-EI

- **Non-blocking 40 GE** interconnection network, 1 +1 link backup
- **TRILL**: 512 nodes Large L2 network
- **Front-to-rear/Rear-to-front** air ventilation
- Up to **16-member** stacking
- Work with Huawei **nCenter** for rapid VMs migration

	CE6850-48T4Q-EI	CE6850-48S4Q-EI	CE5850-48T4S2Q-EI
Interface	48*10 GBase-T and 4*40GE QSFP+	48*10GE SFP+ and 4*40GE QSFP+	48*10/100/1000 BASE-T , 4*10G SFP+ , 2*40GE QSFP+
Switching Capacity	1.28 Tbps	1.28 Tbps	336 Gbps
Forwarding Ability	960 Mpps	512 K/slot	252 Mpps

# High Availability Inter-Data Center-NE Routers

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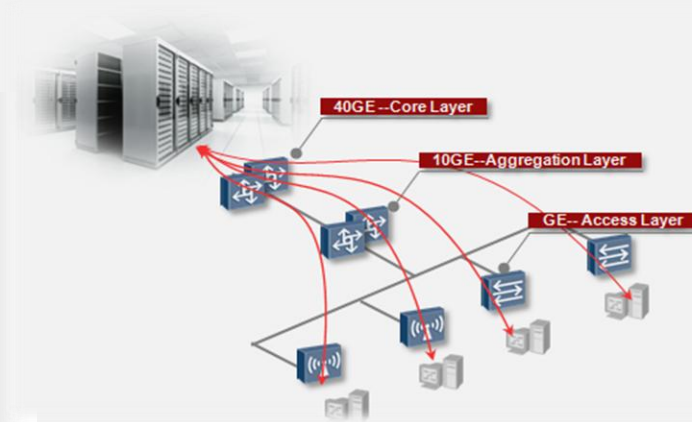
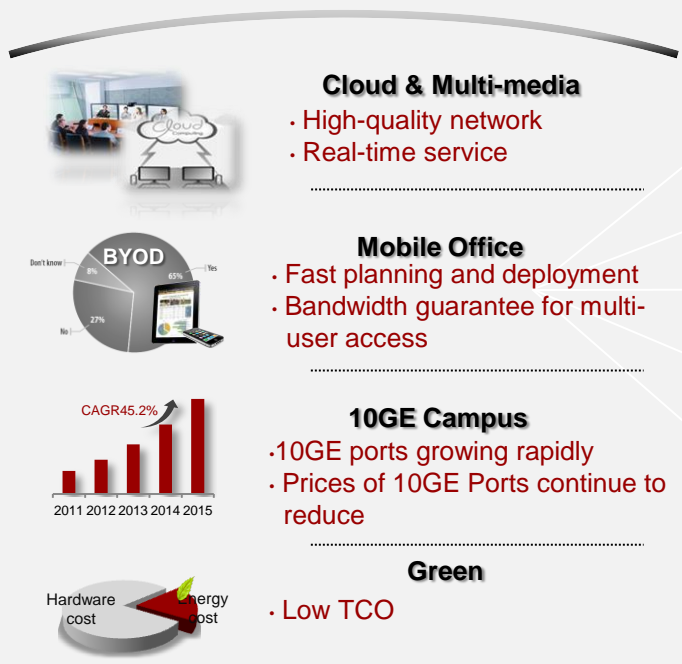

NE40E series

- Up to **400G/slot** capability, meet **5 to 10** years business needs
- Non-stop business, fault recovery within **50ms**
- IPv6 Ready Logo **Phase-2** and mature commercial
- Visualized O&M, improve **80%** of efficiency

	NE40E-X16	NE40E-X8	NE40E-X3
Switching Cap.	12.58Tbps	7.08Tbps	1.08Tbps
Forwarding Ability	3200Mpps	1600Mpps	300Mpps
HQoS Queues	512 K/slot	512 K/slot	512 K/slot

# Huawei Campus Network

User needs high-bandwidth  
How to deploy 10G Campus?



## Cloud Ready Campus

High Quality Networks

## Mobile Campus

Highly Available Wireless Services

## 10GE Campus

Resilient, On Demand Architecture

## Green Campus

Energy Efficient Networks

# Converged and Easy Branch Network



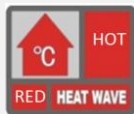
**Converged**

**Simplifying the Network Architecture**

**Easy**

**Making Deployment Simple**

# Deploy high reliable WAN



*Intelligent unified management*

## 100G bps “IP + Optical” Synergy

Make solutions easier

## 2Gbps networking microwave

Get bandwidth larger

## PIPE

FTTx/xPON

MS-OTN/WDM  
Hybrid MSTP

Core router  
& security

*High Reliability, guarantee future!*

Industrial PON

MS-OTN ASON

IP&WDM Synergy



Power



Transportation



Government



Energy



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