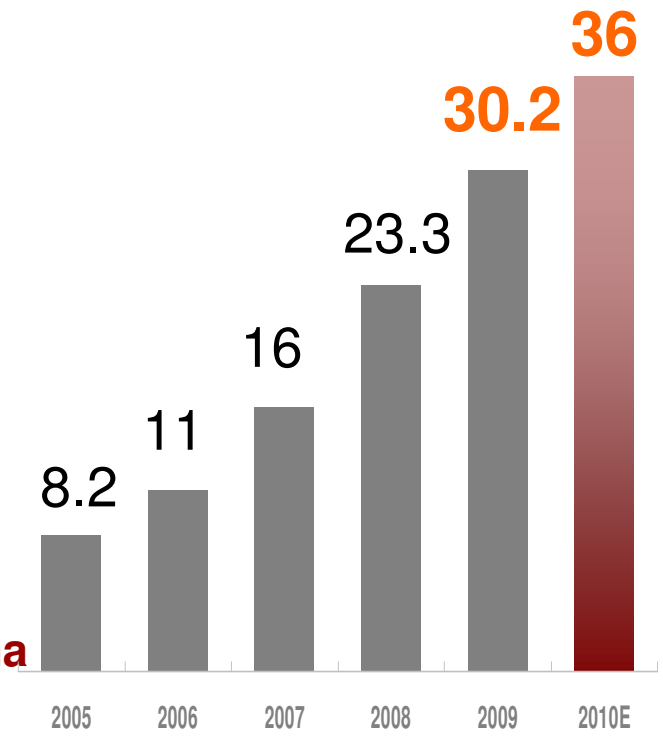
Carrier-Centric IP Partner

Solid Partner with Strong Growth in IP

- **No.3 Network Solution Provider**
  - 2009 Revenue/Profit USD 21.8B / USD 2.7B
  - Customer Driven Innovation
  - E2E solution synergy
- **Strong Growth in Carrier IP Market**
  - No.3 in both IP core (11%) and IP edge (16%)
  - Strong Presence in Europe & Emerging Market
  - FT, Telefonica, T-Mobile, Vodafone, Versatel
- **Routers Designed in US, Implemented in China**
  - R&D expense / revenue = 12-15%
  - Silver-bullet talents from US and Europe
  - Massive R&D infrastructure



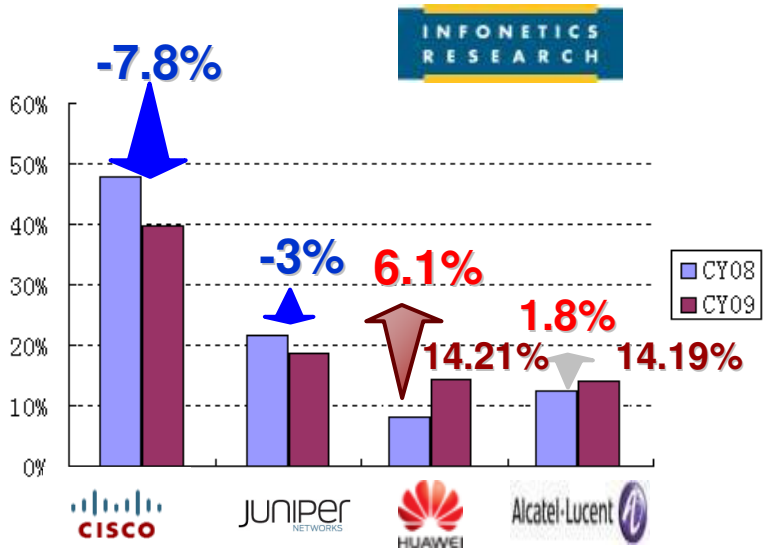
Contract sales (USD in billions)

Global Market Leader in IP

1. In 2009, Huawei is the only supplier with significant IP business growth, WW SP Market Share 14.21%

2. No.3 in IP Core
   - C/J/H (50%/29%/11%)

3. No.3 in IP Edge
   - C/A/H (36%/20%/16%)



Partnership with Top Operators in IP

- **Strategic Partner** with CMCC in All-IP Transformation
- 700+ sets of NE5000E/80E/40E deployed for Mobile IP Bearer Network, serving 520+ million subscribers

- **No.1 share** in China Telecom's metro Ethernet networks and BRAS
- NE5000E cluster router in core nodes of the world's largest Internet Backbone (163)

- **NE5000E cluster router** serving in FT's Open Transit Internet core nodes
- NE80E/40E service router deployed in Mobile IP Bearer Network and Internet Backbone in 3 subsidiaries of FT/Orange - Belgium, Mauritius and Cameroon

- **Global cooperation with Telefonica in All-IP**, from metro Ethernet to edge, core
- More than 400 sets of CX600/NE40E deployed in Telefonica Spain (including Madrid, Barcelona), Brazil and Peru. Huawei's **carrier IP solution** fully meets TdE strategy of converged metro and IP edge

- **NE5000E cluster router** build new IP/MPLS backbone for Online in Netherlands.
- **Converged mobile backhaul** network based on CX600 to be deployed in T-mobile networks throughout Europe, including Austria, Czech, Netherlands, UK, etc.

- NE80E/40E service router & ME60 BRAS deployed in **Mobile IP Bearer Networks and Internet Backbone** - - Romania, Poland, New Zealand and Kenya

Global IP R&D Led by Top Talents

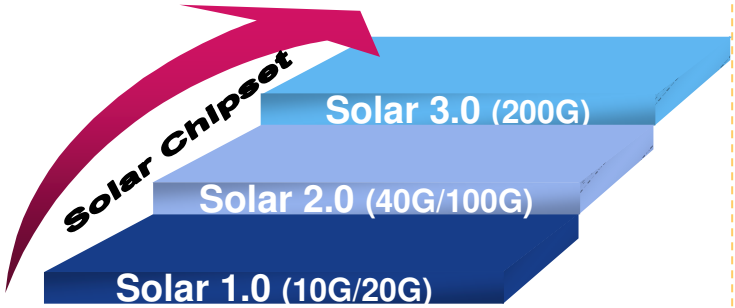
- **Globally 3 IP OS/Chipset R&D Centres (Shenzhen, Beijing, North America)**
- **Top Talents from the Industry:** Michael Beesley (ASR 1000), Bill Lynch (CRS-1), John Vencent (Silicon Access NP), Richard Li (JunOS), Sue Hares (BGP)

Michael Beesley, Leader of router product planning and architecture, former CISCO ERBU CTO, Juniper core router architect

Bill Lynch, Solar chipset team leader, former CISCO Senior Director for world's first 40G NP, Sun SPAC IV architect

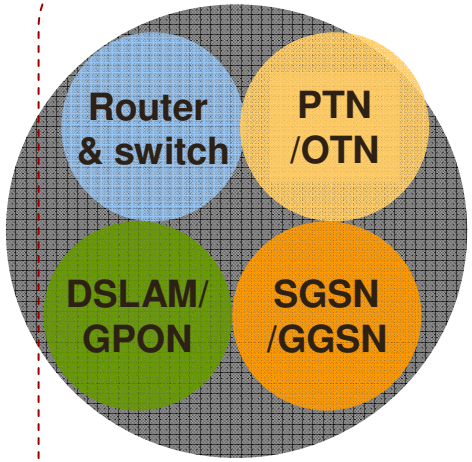
John Vencent, NP team leader in Ottawa, former SiliconAccess NP leader

- **30+** top-guns in chipset core areas



- **65nm/45nm** technology, **450M** transistors
- 2010 ship 10*10G/100G linecard with leading power consumption efficiency of **45W/10G**
- 2011 200G linecard, yielding **320*10G** per chassis

Unified IP OS Platform – VRP



- **Unified** software platform for router & switch, access, transmission and core network

- **2,000,000+** VRP powered routers deployed globally
- Industry's **ONLY** full-service distributed OS (L3VPN/L2VPN/TE)
- **Process-level** failure protection, plug-and-play, **modular** upgrading of software & hardware

Unified IP OS **VRP**

Mature and Leading IP OS

Bridge between IP and Telecom


Core/edge Router


Cluster Router


LSW


DSLAM /GPON

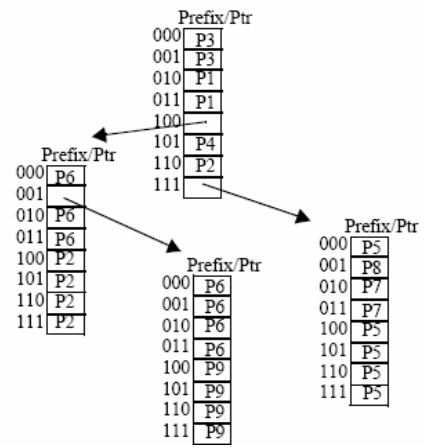

PTN/OTN


SGSN/GGSN

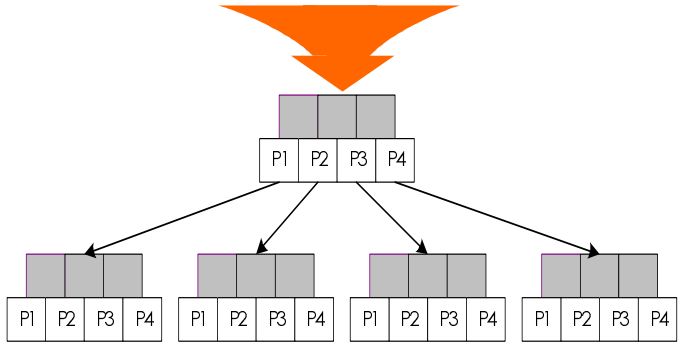
- New feature can be quickly shared on all equipment sharing the platform
- Leads to overall competitiveness in: seamless MPLS, E2E IPv6, GMPLS and MPLS-TP

IPv6 Address Lookup Challenge: B-tree

- **M-trie Based Lookup**
  - Good for IPv4, Not Good for IPv6
  - 32bit IPv4, 4 SDRAM Access
  - 128bit IPv6, 16 SDRAM Access
  - Worst case: 10% capacity, 10% performance
- **B-tree Based Lookup**
  - Good for IPv4, Good for IPv6
  - 3 SDRAM Acess both for IPv4 and IPv6



- M-trie Based，Good for IPv4(32bit)
- Not good for IPv6时(128bit)



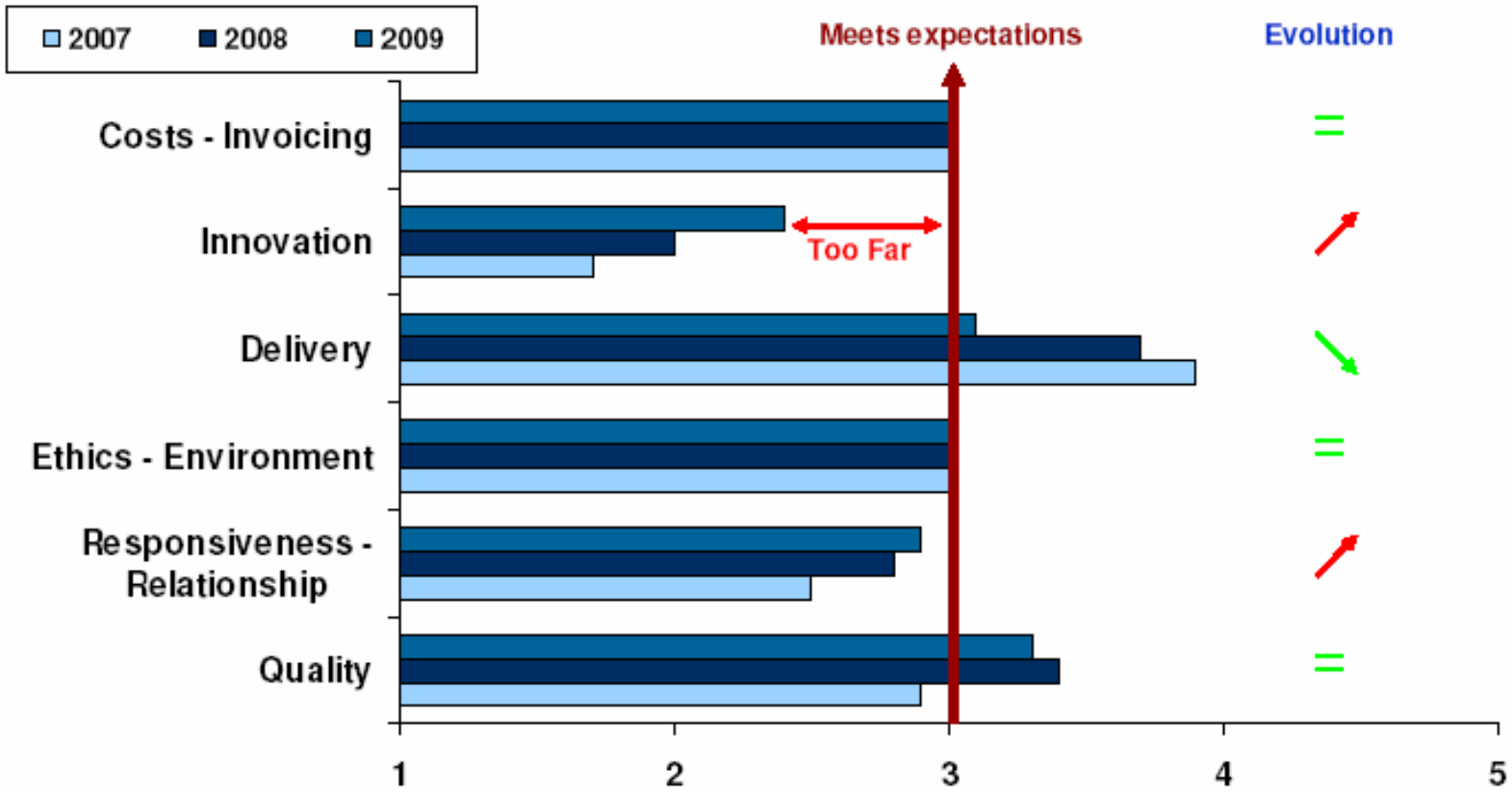
Largest Router Testing Plant of Industry

- New version Test
- Project Test
- Interoperability Test

Based on **500+** core routers

- Integrating test resource, efficiency up to **100%**
- **1:1** simulating for real network, covering all test items
- **7×24** auto intelligent test technique, **1** button operation

QREDIC RESULTS OVER 3 LAST YEARS
CORE ROUTER TECHNOLOGY



- Quality of products as well in validation, trials as on site.
- To provide better visibility with more accurate information for roadmap.
- To be much more active in providing concrete innovative solutions.

More Innovations, More IETF Contributions

Spencer Dawkins

Member of the Internet Architecture Board

Chair of three working groups in the Real-time Applications and Infrastructure Area. The author of RFC 4925 - Softwires Problem Statement.

Adrian Farrel

Routing Area Director

Liaison from the IETF to the ITU-T on the optical control plane. IETF lead on MPLS-TP. Author of over forty RFCs

Sue Hares

Co-chair of Inter-Domain Routing working group

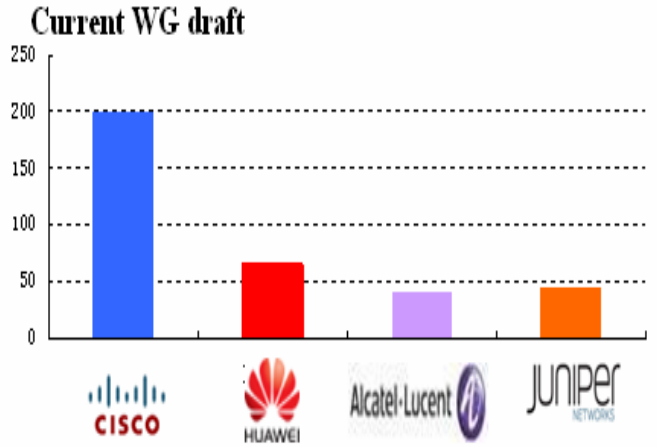
IETF participant since almost the first meeting.
One of the world's foremost experts in routing technology.

David Harrington

Transport Area Director

Operations and Security expert.
Author of thirty RFCs.

- **Leading Role in IETF:**
- **1 IAB(5)**
- **2 ADs(9)**
- **10 Working Group Chairs**



* WG drafts will become RFCs later. The number indicates how active is a vendor's involvement in IEFT
** WG draft number updated on March 5th, 2010

Optimize Network Architecture; While Growing the Router Capacity “Brutally”

- **Reduce IP Hops (Multi-Technology Synergy)**
  - CDN Expansion: localize IP traffic, trade storage for bandwidth
  - PPPoE/IPoE migration: L3 forwarding ASAP to avoid L2 hairpin
  - IP+Optical synergy: more direct routes, less packet hops
- **Reduce MBB cost (Fixed Mobile Synergy)**
  - Mobile backhaul leverage any physical medium (Cu/lamda/…)
  - Fixed Mobile Convergent Backhaul for FBB/MBB
- **Reduce truck-roll (User-Centered Operation Mode)**
  - PnP Installation
  - Visualizing IP traffic behavior, mapping user SLA to network SLA

Working with SPs to Accelerate IPv6 Deployment:

Serving a Critical Mass with Converged IPv6 Solution

	Subscribers	Solution	Huawei Involvement
China Telecom	240M	Dual Stack+NAT44 or CGN	Trial
China Mobile	530M	PNAT or CGN	Trial in Plan
France Telecom	180M	CGN	Ready for test
Telecom Italia	60M	CGN	Trial planned for 2010;

- Huawei works with Tier 1 of EU and China on IPv6 evolution solution;
- All of the requirements would be addressed with unified platform and converged solution to achieve **economy of scale**

Highly-Scalable Backbone with the First 2+4 Cluster Commercial Deployment

Challenges

- The needs of broadband service keep strongly growing up
- Facing the direct and indirect competition from other broadband service and wireless service providers
- Improving the operation efficiency further

Huawei ’s Solution

- **2 sets of 2 + 4 NE5000E cluster** were used in Xi’an MAN Egress
- Supporting smoothly system expansion which significantly saved the investment on network
- Two CRS-1s as the core routers originally were replaced by NE5000E in this project

Benefits to China Telecom

- Step-by-step scalability of Metro Network, which maximizes investment protection for “0” waste
- Upgrade without hardware substitution, and on-demand configuration to ensure network availability
- 163 long-term stable run record since 2004

SingleMetro Helps Telefonica Spain Enter FMC Era

Challenges

- Considering Ultra Broadband for future digital home
- Existing 2G network fails to meet 3G requirement, FMC migration and one metro/RAN network for F/M service

Huawei Solution

- 200+ CX600 deployed in Phase 1 for 4 MENs in 2008, 100% share of new contract in 2009, including Madrid and Barcelona
- Customized high reliability solution: VPLS dual-homing, load sharing, TE-FRR
- Multi-service deployment: HSI, VoIP, IPTV, VOD, Enterprise L2 VPNs and IP Backhaul

How Telefonica Benefited

- Seamless integrated with existing VPLS solution
- Unified platform with L2 &L3, protecting investment with smooth service evolution
- Customized development, fast response

Telefonica

Thank You