Idea to Reality

2007.12 Hong Kong
Technical Evolution Roadmap

**CDMA2000 path**
- CDMA2000 1X (2001)
  - DL: 153.6k
  - UL: 153.6k
- CDMA2000 1xEV-DO (2003)
  - DL: 2.4M
  - UL: 153.6k
  - DL: 3.1M
  - UL: 1.8M
  - DL: 1.25M-20MHz
  - UL: 35M

**WCDMA path**
- R99/R4 WCDMA (2001)
  - DL: 14.4M
  - UL: 384k
- R5 HSDPA (2004)
  - DL: 14.4M
  - UL: 384k
- R6 HSUPA (2005)
  - DL: 14.4M
  - UL: 5.76M
- R7 HSPA+ (2006)
  - DL: 14.4M
  - UL: 11M
- LTE (2008)
  - DL: 22M
  - UL: 11M

**UMB**
- DL: 152M
  - UL: 75M (2x2 MIMO)

**WiMAX 16e**
- DL: 1.25M-20MHz
  - UL: 35M

**LTE**
- DL: 1.25M-20MHz
  - UL: 72M
OFDMA based air interface eliminates the intra-cell interference
  - Orthogonal transmission is ensured

Multiple Input Multiple Output (MIMO) configuration, up to 4x4 MIMO:
  - Provides higher spectral efficiency
  - Higher peak data rate
  - Higher data throughput rates

Spatial Diversity Multiple Access (SDMA)
  - Reduced interference
  - Better cell coverage

Combining MIMO with SDMA optimizes network performance

Beamforming
  - Reduced interference
  - Improve capacity
UMB FL Multi-Antenna Techniques SDMA-MIMO

SDMA-MIMO provides capacity multiplication and link budget benefit

Equivalent to increased sectorization and is standard independent

- Dual polar MIMO is transmitted over each cell partition
- Number of cell partitions increased using antenna array and passive beamformer
- Data rates increased to single user – multiple UE antennas, BS typically transmits MIMO on dual polarisations
- Only SIMO capable terminals

SDMA

MIMO

Beamforming

Only SIMO capable terminals
Mobile Broadband is more and more important, Wireline will withdraw behind wireless access, ubiquity of wireless and bandwidth of wireline will together improve user experience.

New ISP such as Google, Ebay etc, and Intelligent terminals lead to the independence of service from network. Operators will lost the control of terminals and applications.
From Vendor’s point of view: Future-oriented Strategy

- **Industry-leading Product and Solution**
  Providing industry-leading solution to enable operator more competitive with *continuous investment* in CDMA R&D

- **Future-oriented Design**
  Advanced architecture and design philosophy enabling *smooth expansion and continuous evolution* for future, to protect operators’ investment and provide easy operation as well

- **TCO Saving in Network Life Cycle**
  Focusing on operators’ pressures and challenges, *customized innovation* reduces total cost for operation, *TCO saving* in the network life-cycle
Customer’s Requirements

- Resource Sharing
- Universal O&M
- Low maintenance (Power consumption transmission rental)

- Innovative Services
- A wide range of value-added services

TCO

- Time to market
- Terminals
- International roaming
- ...

Market

- Seamless network coverage
- Continuity of subscriber experience

Service

Network

Customer
Huawei's Mobile Next Generation Broadband Strategy

Huawei is:

- Technology agnostic and plan to support all major 4G technologies: UMB, LTE and WiMAX.
- Well positioned to support UMB, and has an aggressive 4G product Plan of Intent (POI) with TTM advantages.
- Investing consistently on CDMA and its 4G smooth evolution to protect our customer's CDMA 3G investment so to meet their technology and business needs.
- Playing actively a leading role in 3GPP2 standards body, and made major contributions in ensuring the timely completion and technical excellence of UMB standards.
Solutions in the Face of Convergence

Fixed
- NGN
- Switching
- FTTx
- xPON
- DSLAM
- MSAN

Mobile
- UMTS/HSPA/LTE
- GSM/GPRS/EDGE
- CDMA2000/UMB
- WiMAX
- TD-SCDMA

FMC based on All IP

Optical Network
- MSAN
- LAN Switch
- Security & VPN
- BRAS
- Firewall

Value added service
- IN & Convergence Billing Solution
- Messaging+
- Digital Music
- Digital Media
- Mobile Data Service
- BSS

Terminals
- Mobile Phone
- Mobile Data Device
- FMC Terminal
- Video Conferencing Terminal
- Set-Top Box
- Access Terminal
Four Generation BTS

Never stop focusing on

- High quality and stability
- Reduce CAPEX & OPEX
- Fast deployment
- Smooth evolution
- Improve power efficiency

Huawei BTS Evolution

- Distributed architecture
- BBU: Saving space
- RRU (Single mode)

Convergent architecture
- C/W/G/UMB/LTE/WiMAX Co-platform
- Smooth evolution to UMB/LTE
- Stackable Design

Indoor outdoor BBU RRU MRFU

ODU3601C
ODU3601CE
BTS3606C

We are here!

BTS3612
BTS3606
BTS3606E

BBU3606
RRU3606

BTS 3612
BTS 3606
BTS 3606E
V1
V2
V3
V4

Huawei BTS Evolution
Advanced Architecture: Same modules for all BTS portfolio

**Convergence** Distributed BTS and traditional BTS, Only 3 module for all BTS

- More flexible for deployment
- Optimized Logistics costs
- Minimized spare part stock
- Lower Maintenance costs

Main Module
- 19 inch
- Support 24 TRX
- RRU/RFU 60W/80W Output Power

Distributed BTS

Indoor macro BTS

Outdoor macro BTS
Vision on Mobile Core Network - Unified Platform

- Open and standard-based architecture
- Widely applied in core network
- Easier to operate and maintain to help reduce TCO
- System enhanced by Huawei’s mature middleware DOPRA

Open Standard-based Platform across Applications

Open Standard-based Telecom Architecture (OSTA)

Distributed Objected-oriented Programmable Real-time Architecture (DOPRA)

Carrier Grade OS

Applications

Middleware

OS & HW
Unique Strengths of Huawei ATCA

Key Features
- Dual-dual star switch topology
- Full redundancy supported
- Hybrid intelligent platform management interface (dual star + bus)

Key Benefits
- Higher capacity
- Higher reliability
- More advanced management
Thank You

www.huawei.com