Mobile Network Future Trend

**IP Access Network**
- ALL IP Architecture
- ALL IP Hardware Platform

**IP Core Network**
- ALL IP makes Core Network flat
- ALL IP Hardware platform

**IP Service Network**
- Open Architecture IP service engine
- Abundant IP Multimedia Service

**IP Bearer Network**
- IP wireless Bearer
- IP interface

**IP O&M Network**
- ALL IP structure O&M Network
- Control based on IP, simplified manage

**IP Intelligent Terminal**
- IP Core based on IN terminal
- Abundant IP Multimedia service experience
Unified All-IP Platform

Unified hardware structure in all NEs

- N*E1
- POS/GE/FE
- STM-1

IMA Access Module
IP Access Module
ATM Access Module

Flexible interface: TDM/ATM/IP

Narrowband Signaling Process Module
Main Signaling Control Module
Main Control Module/Resource Control
Voice Transcoder Module
MRM Resource Module
IWF Module
Digital Trunk Interface

Circuit Switch Network

- 256K*256K TDM switch network
- Interworking with TDM network

IP Switch Network

- CrossBar switching
- Maximum 80G switch capacity

Dual switch platform
Flexible interface
ZTE V3 Platform Highlights

**All-IP Unified platform**

- Shared common boards: **Easier maintenance, reduce CAPEX**
- Modularized structure: **Easier expansion**
- All-IP structure: **Smooth evolution to IMS**
- High integration, large capacity: **IP -- 80Gbps, TDM -- 256k*256k**
- Abundant interfaces, flexible networking: **E1/T1/N*E1/N*T1/FE/GE/POS/STM-1**

**ZTE V3 Platform**

- Perfect compatibility: **inter-connect with PSTN/other PLMN/Internet**
- Multi-level redundancy: **Port-level -- 1+1,N+1,load sharing; Board-level -- 1+1,N+1,load sharing; NE-level -- MGW dual-homing, lu-Flex (MSCS pool, SGSN pool), HLR disaster tolerance, GGSN load-sharing etc.**
- Abundant service supporting: **Meet the service requirements.**

Flexible Solution
General Parameters for V3 Unified Platform

Rack Specifications

- **Weight**: ≤350kg (Full configuration)
- **Dimension (Depth×Width×Height)**: 800mm×600mm×2000mm
- Four shelves can be installed in each rack. Each shelf contains 17 broad slots.

Shelf Types

- **Control Shelf**: Takes charge of the signaling processing, operation maintenance within the rack. Backplane is BCTC
- **Resource Shelf**: Takes charge of low level interface processing, user plane processing, and other process related with PS Domain. Backplane is BUSN.
- **IP Switch Shelf**: Provides first IP switch platform, and uses for the extension of resource shelf. Backplane is BPSN
- **Circuit switch shelf**: Provides the circuit switch platform for the system. Backplane is BCSN
**All IP Solution of ZTE CN**

**Advantages for All IP**

- Centralized MSCS and distributed deployment of MGWs: Centralized O&M and low OPEX
- Large Capacity can decrease CAPEX and OPEX
- TFO/TrFO give the high Quality of service and cost less CAPX
- MSC Pool and BSC Pool means stabler structure, load sharing, less CAPEX
- Saving transmission investment
- Reducing cost of equipments

**Unified Platform for Z-CORE**

- MSCS /MGW /CSCF
- HLR /MSCe
- BSC /HSS /RNC

**All-IP Design**

- IP Architecture
- IP Interface
- IP transmission
- IP-based QoS
Different NEs in one rack

It is easy to extend by adding single boards, shelves or racks.
Содержание

- ALL-IP PLATFORM
- Mobile network reliability issues
- WiMAX
ZTE provide perfect redundancy mechanism for operator to ensure the reliability of the network.
**MGW Load Sharing**

BSC/RNC can access several MGW at same time

- Calling load sharing
- A RNC/BSC can be connected to several MGWs, load sharing between MGWs, load in different MGWs can be adjusted flexibility when MSCS distributes resource. When one MGW is down, load from RNC/BSC will be sent to another MGW without affecting services.

- Signaling load sharing arithmetic
  - M3UA transfer
  - M2UA Master/Slave
  - M3UA agent
MGW Dual Homing

- Dual home of Mc can be used for disaster recovery.
- MSC Server works in Primary or Slave mode for a specific region. A slave MSC server will take over the control of service when primary one fails, and transfer the control back when primary one recovers.
- Eliminating single point of failure via dual home
- Same signaling point code for both primary and slave MSC Servers.
- Heart-beating Link is used to detect status of peer server.
Dual Homing Solution

- Networking
  - 1+1 load sharing
  - 1+1 Master/Slave
  - N+1 Master/Slave

- Data synchronization
  - Static data synchronization
  - Dynamic data synchronization

- Reduce the influence when MSCS switch happening
  - Call holding (1~30min that can be set)
  - Short time switch (40s~2min)
  - CDR won’t lose
MGW can provide NNSF and virtual MGW function, do not need BSC alteration.

Support multi-capability of BSC and meet the requirements of smooth evolution for wireless network.
- BSC based on TDM
- BSC based on TDM and support NNSF
- based on IP
- BSC based on IP and support NNSF

User information synchronized automatically inside MSC POOL to resolve the called problem.
**HLR Redundancy**

- **Mature 1+1 mutual backup redundancy**
- **World widely deployment**

**Mutual Backup**

- HLR 1: 50% service
- HLR 2: 50% service

**N+1 redundancy**

- Mature N+1 redundancy
- Deploy in No.1 operators like CMCC

- Static data
- Redundancy
ZTE N+1 dynamic disaster tolerance HLR

Disaster tolerance HLR SMU
SMU can be laid anywhere

Disaster tolerance HLR

IP Signal
NO.7 Signal
Service is processed in distributed nodes, and every node works in load sharing mode.

Subscribers data is stored in distributed DSAs, and every node in DSA works in load sharing mode.

Based on real time data synchronization, K nodes down will not interrupt the service.
Содержание

- ALL-IP PLATFORM
- Mobile network reliability issues
- WiMAX
1st Chinese company to join the WiMAX Forum.

ZTE is one of the original WiMAX Forum Board members.

One of the first major telecom equipment vendors actively involved in IEEE 16e standards development.

Over 200 proposals have been adopted by the IEEE802.16e.

ZTE driving technical proposals in 802.16m as well.

ZTE is the only Chinese company of the seven original .16m sponsor members.

ZTE Chairs CCSA China Wireless Communications Technology Committee. Influencing China Wireless Technologies development.
Global R&D Matrix of WiMAX

- USA San Diego: Core Tech, Standards
- USA Dallas: ZTE USA HQs, IMS
- Nanjing: CSN, APP
- Xi'an: RF, Simulation, Cards & Modem
- USA New Jersey: NGN, Terminals
- Tianjin: NEW BASE
- Shanghai: Handsets
- Shenzhen: WiMAX HQs
  - ASIC, BB, OMC
ZTE Mobile WiMAX Network Architecture

- ASN Profile C
- Cellular deployments
- Seamless coverage
- Full QoS support
- Support fixed, nomadic, portable, simple mobility and full mobility
Distributed BS leads to Enhanced Coverage

- Feeder loss saving improves coverage
  - Typical Feeder Loss: 7.5dB/100m
  - For indoor Macro BS, usually 50~80m feeder needed
  - For outdoor Macro BS, usually 20~40m feeder needed

- Reduce cost for BS equipment by 20-30%
- Reduce site cost (civil work, site acquisition) by 20-30%
- Reduce site operating and maintenance cost by 20-30%

Better coverage decreases CAPEX & OPEX
Flexible networking

Standard OBSAI Interface
- Maximum 4-level cascade supported
- Flexible networking: star, ring, chain.

- Maximum 18 CS (carrier sectors) supported
- All RRU share GPS resource, convenient for outdoor/indoor installation
Cell Site Deployment Options

- Tower-Top, Tower-Base and Roof-Top RRU deployment options
ZTE WiMAX System Roadmap

- **Agile BS**
  - RA25
  - BBUA
  - AGW
  - HA
  - AAA

- **Distributed Macro BS**
  - R02E
  - BBUB

- **Distributed Pico BS**
  - R01P
  - BBUC

- **Integrated Pico BS**

- **Home BS**
  - BS1H

- **Integrated Macro BS**
  - BS06

- **Frequency Band Requirements**
  - 2.5GHz
  - 2.5/2.3GHz
  - 2.5/2.3/3.5GHz
  - 2.5/2.3/3.5G/700MHz
  - 5/10MHz
  - 5/10/7MHz
  - 5/10/7/20MHz

- **Timeline**
  - 2006 Q4
  - 2007 Q4
  - 2008 Q4
  - 2009 Q2
Thank you!