We Create Wireless Communities

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ZTE MOBILE SOLUTIONS

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Содержание

- 🟢 **ALL-IP PLATFORM**

- 🔴 **Mobile network reliability issues**

- 🔴 **WiMAX**

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

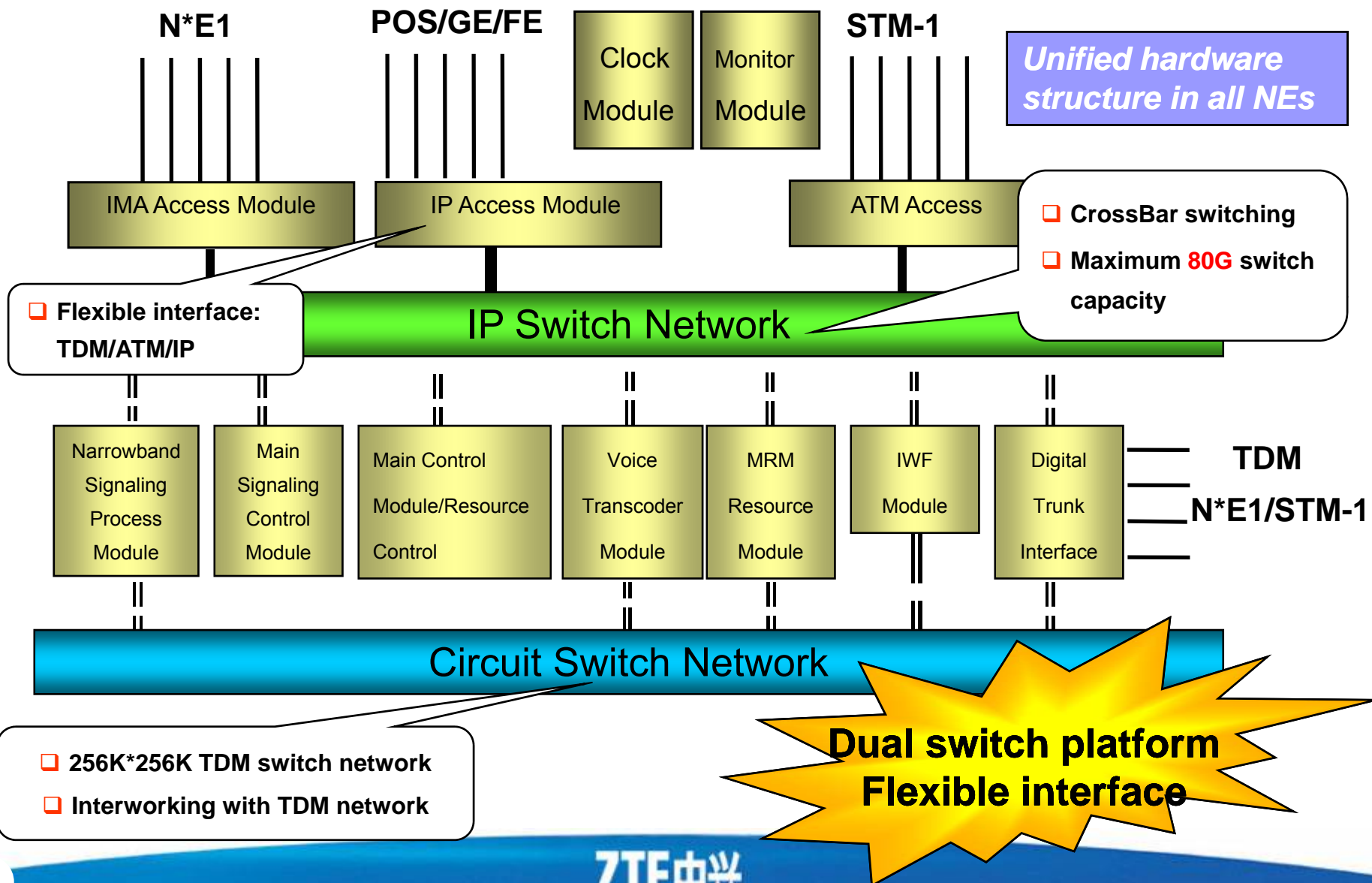◆ IP wireless Bearer

◆ IP interface

IP End to End

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

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Unified All-IP Platform

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

Clock Module Monitor Module

Unified hardware structure in all NEs

IMA Access Module IP Access Module ATM Access

- ❑ **CrossBar switching**
- ❑ **Maximum 80G switch capacity**

- ❑ **Flexible interface: TDM/ATM/IP**

IP Switch Network

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

TDM

N*E1/STM-1

Circuit Switch Network

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

Dual switch platform Flexible interface

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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, Iu-Flex (MSCS pool, SGSN pool), HLR disaster tolerance, GGSN load-sharing etc.**

❑ Abundant service supporting: **Meet the service requirements.**

Flexible Solution
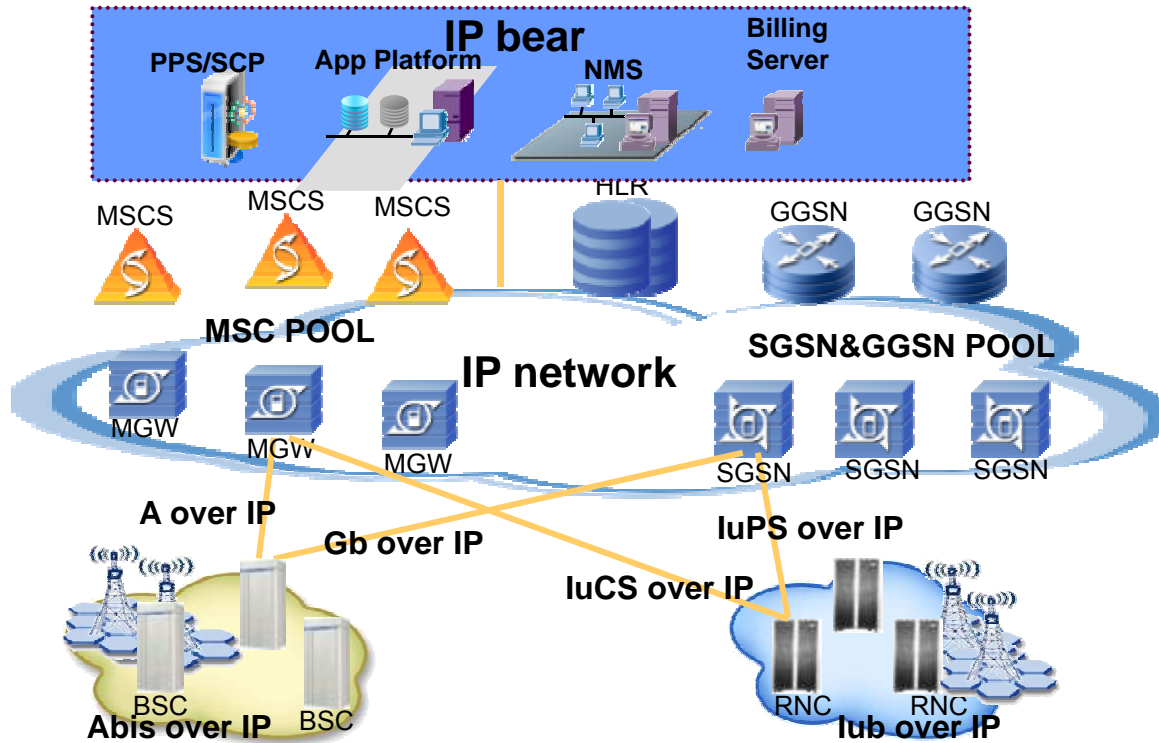
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General Parameters for V3 Unified Platform
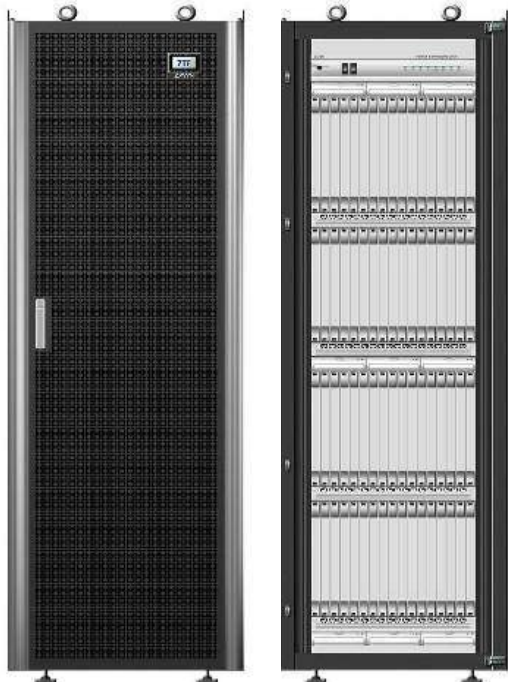
Rack Specifications

❖ 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
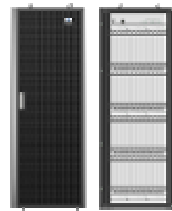
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All IP Solution of ZTE CN

IP bear — PPS/SCP, App Platform, NMS, Billing Server

MSCS, MSCS, MSCS, HLR, GGSN, GGSN

MSC POOL — MGW, MGW, MGW

IP network

SGSN&GGSN POOL — SGSN, SGSN, SGSN

A over IP, Gb over IP, IuPS over IP, IuCS over IP

BSC, BSC, Abis over IP, RNC, RNC, Iub over IP

Unified Platform for Z-CORE

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

All-IP Design

- ◆ IP Architecture
- ◆ IP Interface
- ◆ IP transmission
- ◆ IP-based QoS

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 vice and cost less CAPX

- ◆ MSC Pool and BSC Pool means stabler structure, load sharing, less CAPEX

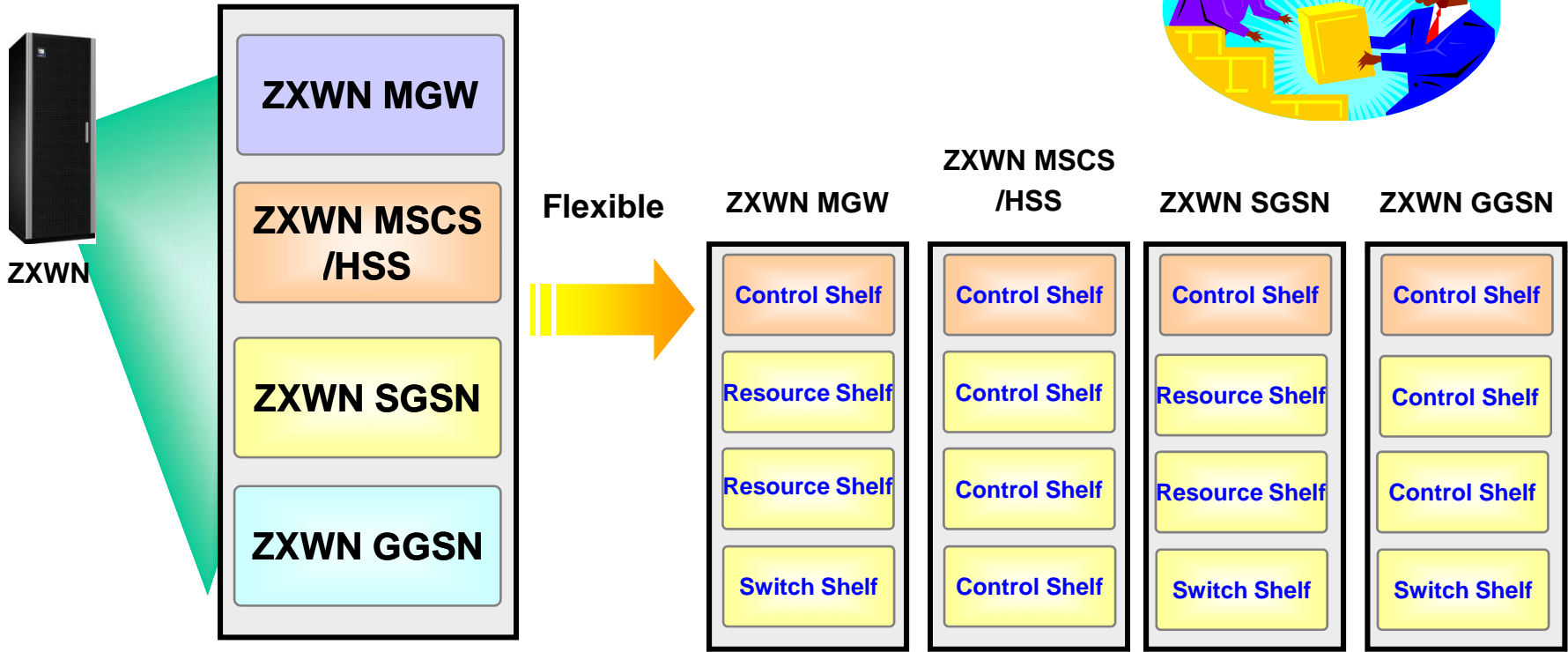- ◆ Saving transmission investment

- ◆ Reducing cost of equipments

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Different NEs in one rack

ZXWN

ZXWN MGW
ZXWN MSCS /HSS
ZXWN SGSN
ZXWN GGSN

Flexible

ZXWN MGW

Control Shelf
Resource Shelf
Resource Shelf
Switch Shelf

ZXWN MSCS /HSS

Control Shelf
Control Shelf
Control Shelf
Control Shelf

ZXWN SGSN

Control Shelf
Resource Shelf
Resource Shelf
Switch Shelf

ZXWN GGSN

Control Shelf
Control Shelf
Control Shelf
Switch Shelf

■ It is easy to extend by adding single boards, shelfs or racks.

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Содержание

ALL-IP PLATFORM

Mobile network reliability issues

WiMAX

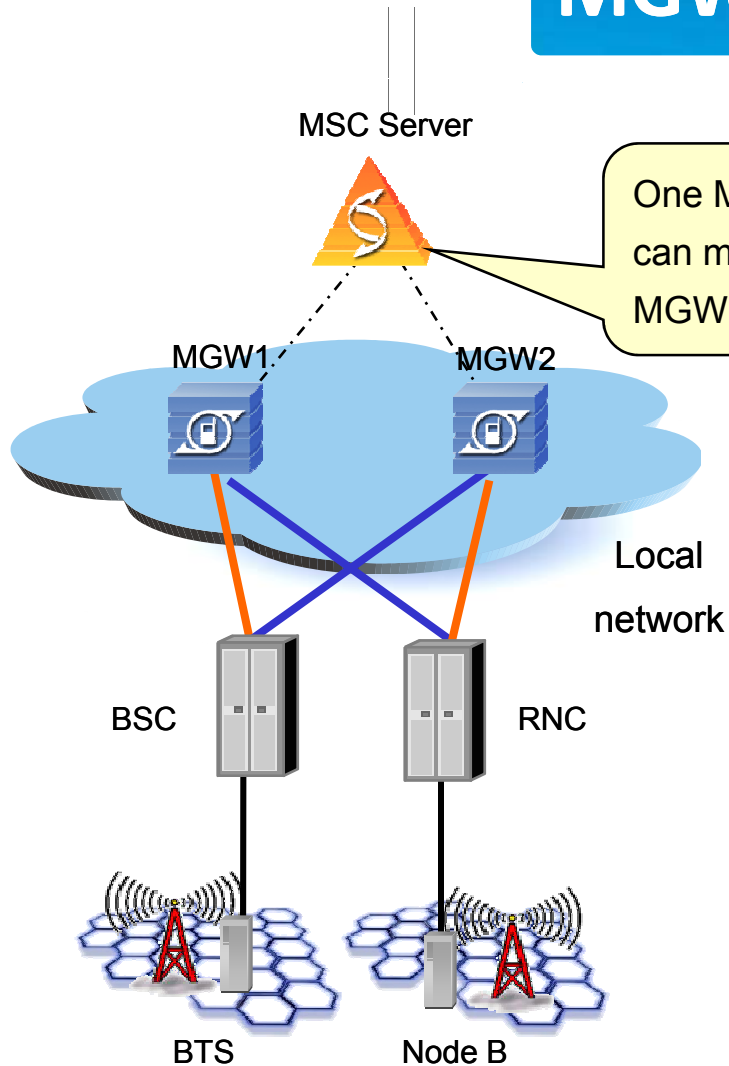# Build a Reliable Network

Network Reliability

Multi-NEs redundancy

Boards redundancy

Ports redundancy
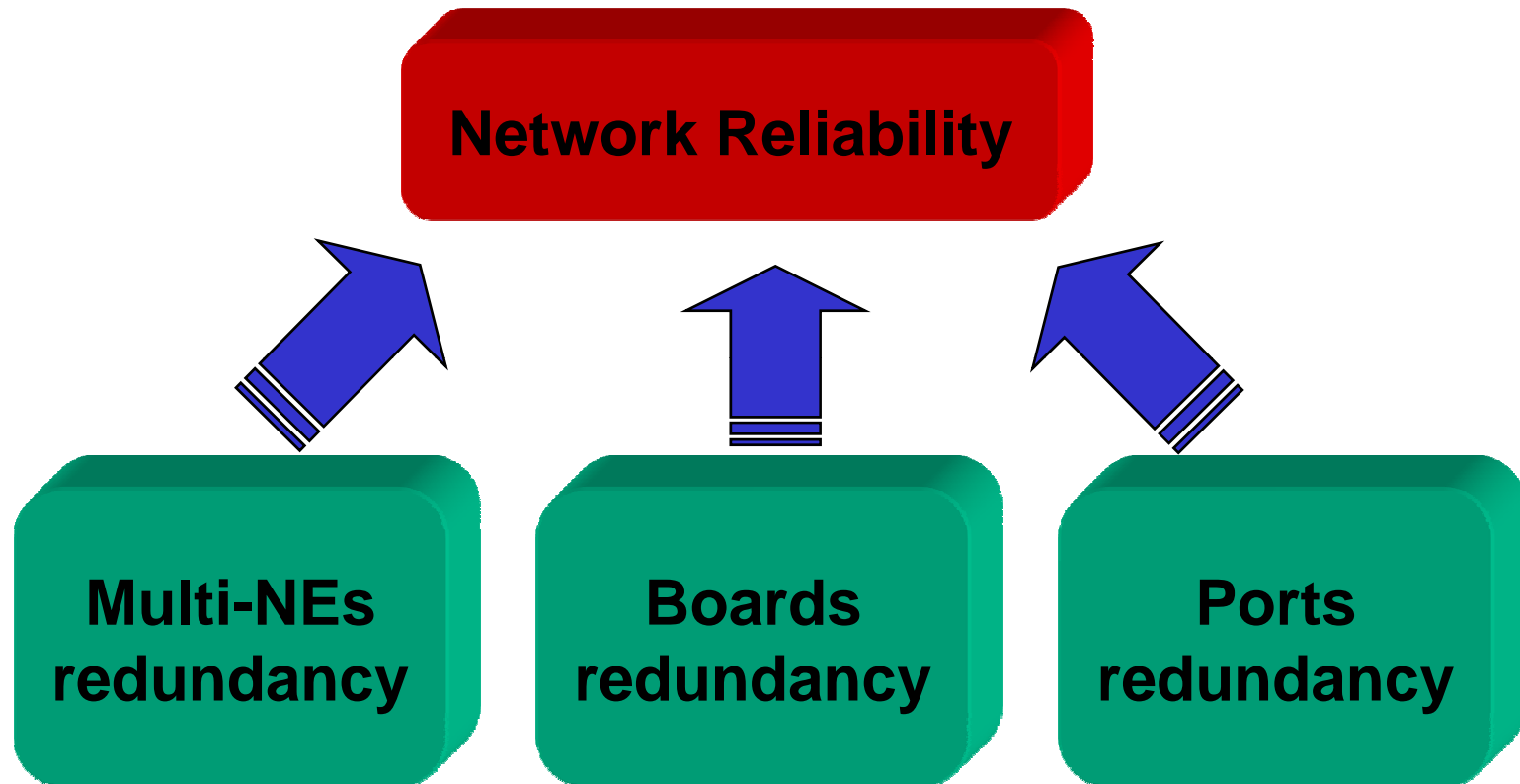
ZTE provide perfect redundancy mechanism for operator to ensure the reliability of the network.

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MGW Load Sharing

MSC Server

One MSCS can manage MGW

MGW1   MGW2

Local network

BSC   RNC

BTS   Node B

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 adjust 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

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MGW Dual Homing

Primary for Region A

MSC Server1

heartbeat

MSC Server2

Slave for Region A

Slave for Region B

Primary for Region B

MGW1

MGW2

MGW3

MGW4

Region A

Region B

One MGW can be connected with two MSC Servers
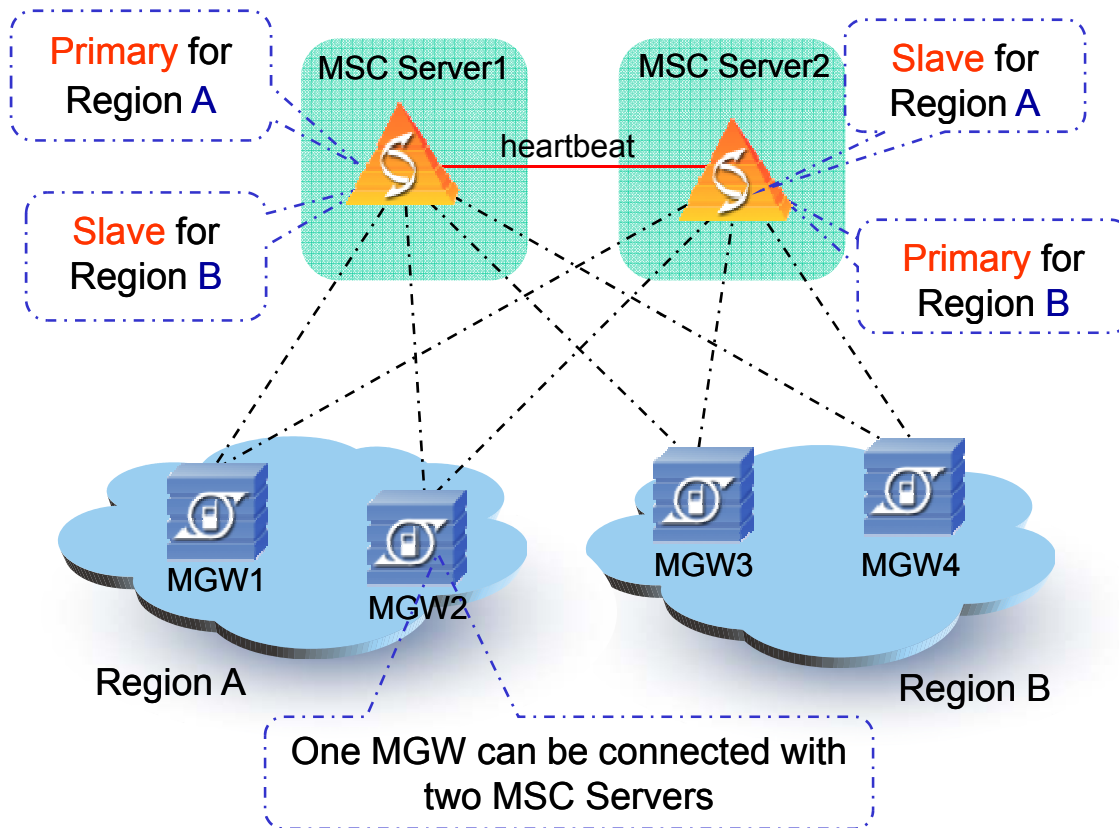
◆ Dual home of Mc can be used for disaster recovery.

◆ 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.

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Dual Homing Solution

- **Networking**
  - 1+1 load sharing
  - 1+1 Master/Slave
 - N+1 Master/Slave
- **Data synchronization**
  - Static data synchronization
  - Dynamic data synchronization
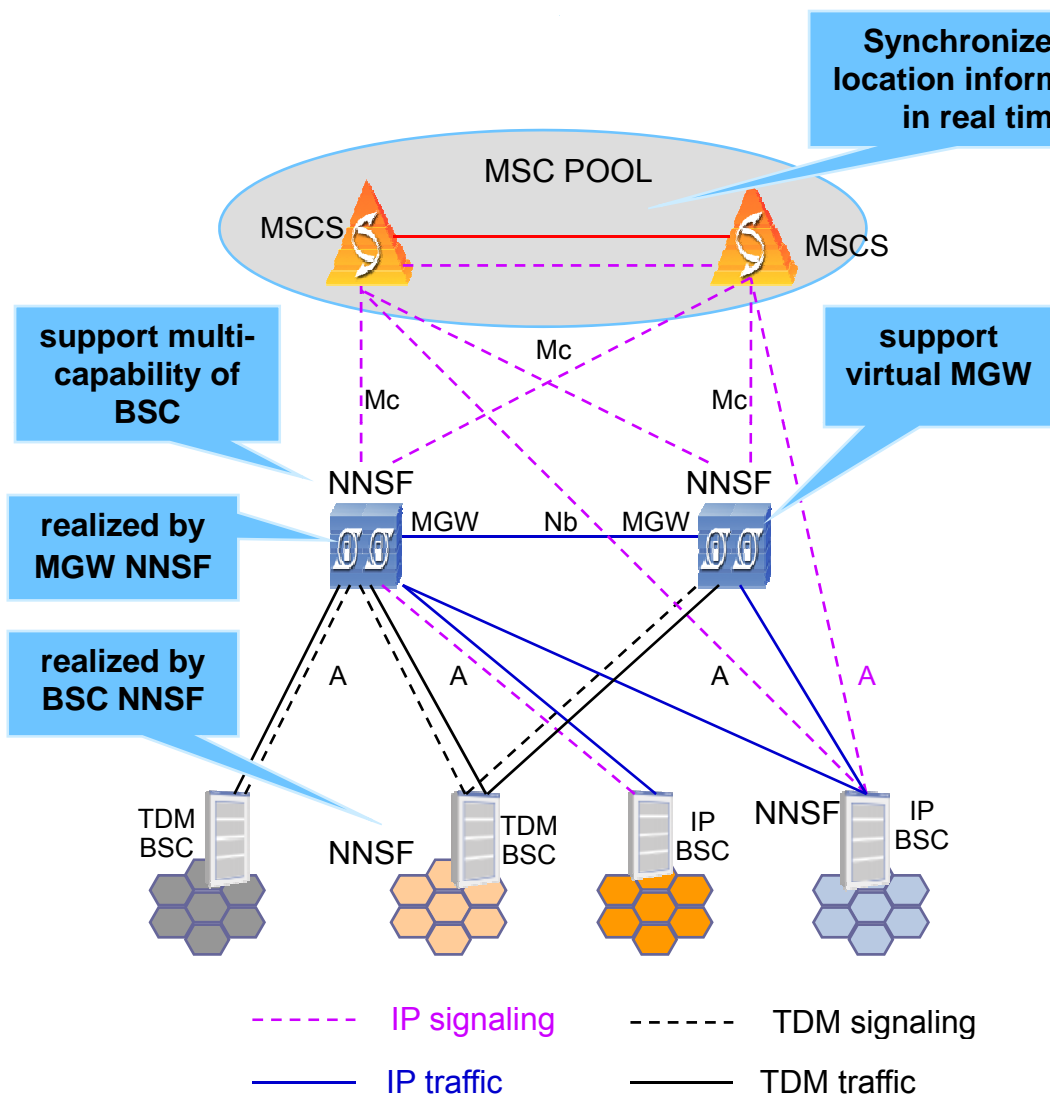- **Reduce the influence when MSCS switch happening**
  - Call holding (1~30min that can be set)
  - Short time switch (40s~2min)
  - CDR won't lose

- Configuration data
- Statistic setting

- Subs location information
- Subs data
- Authenticate triplet

heartbeat

Call holding 1~30 minutes, most calling will finish by itself
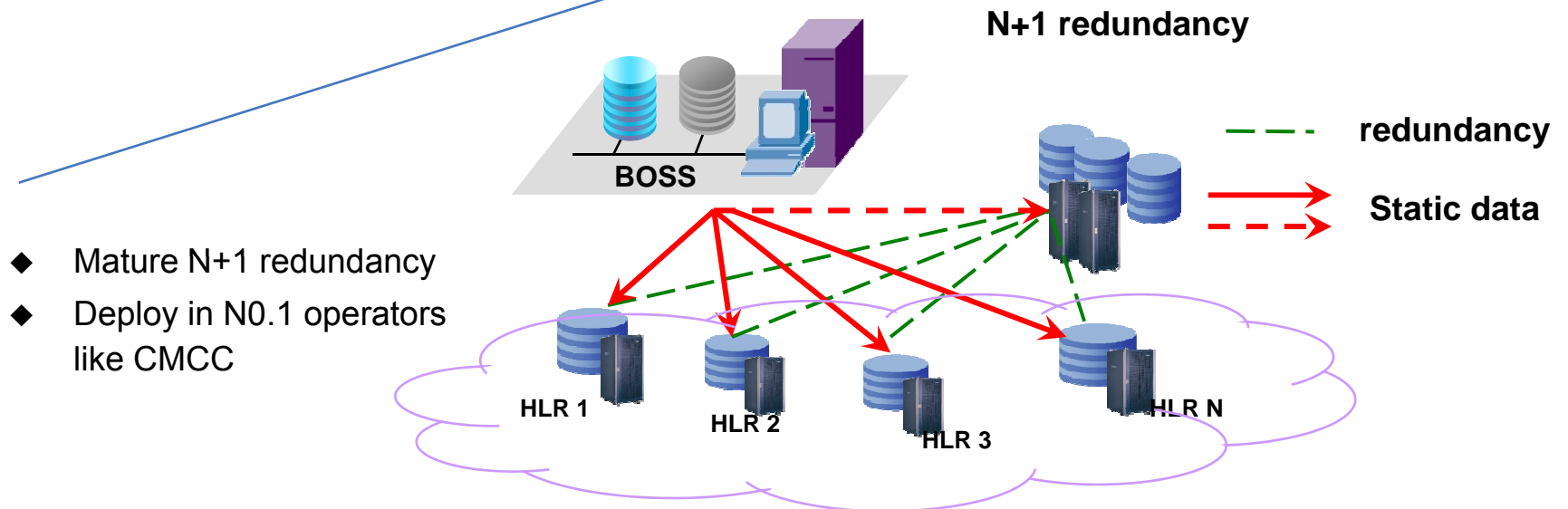
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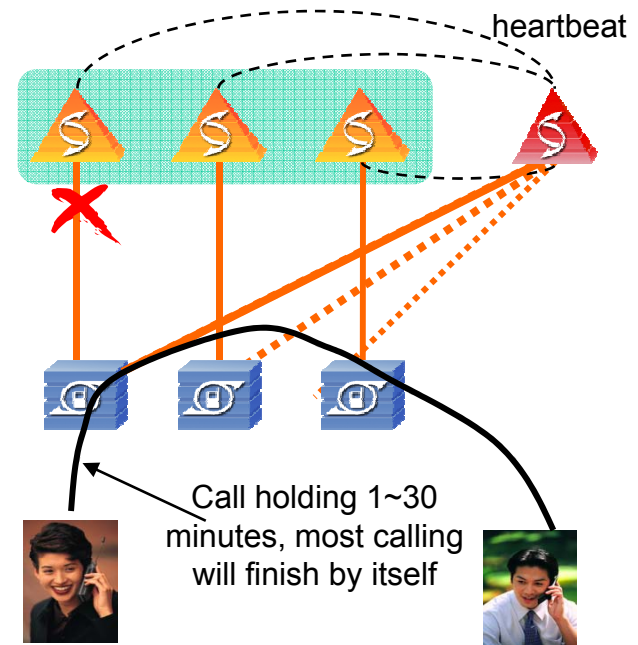
MSC POOL Solution

- ◆ 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.
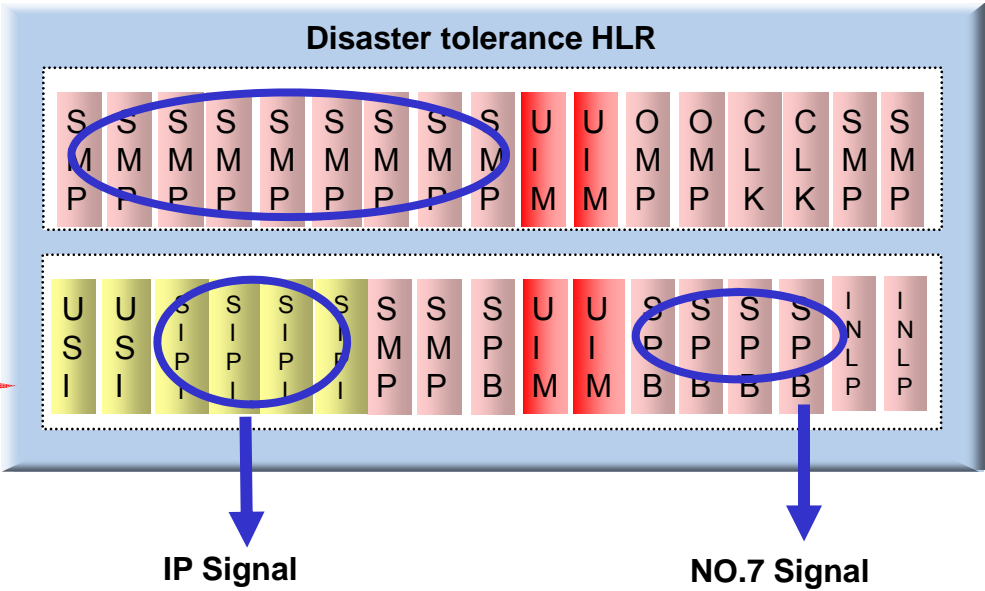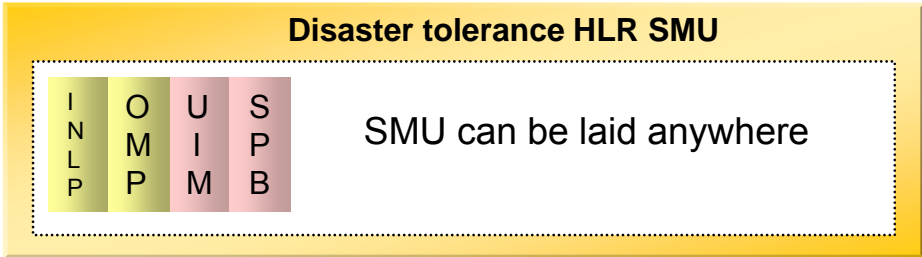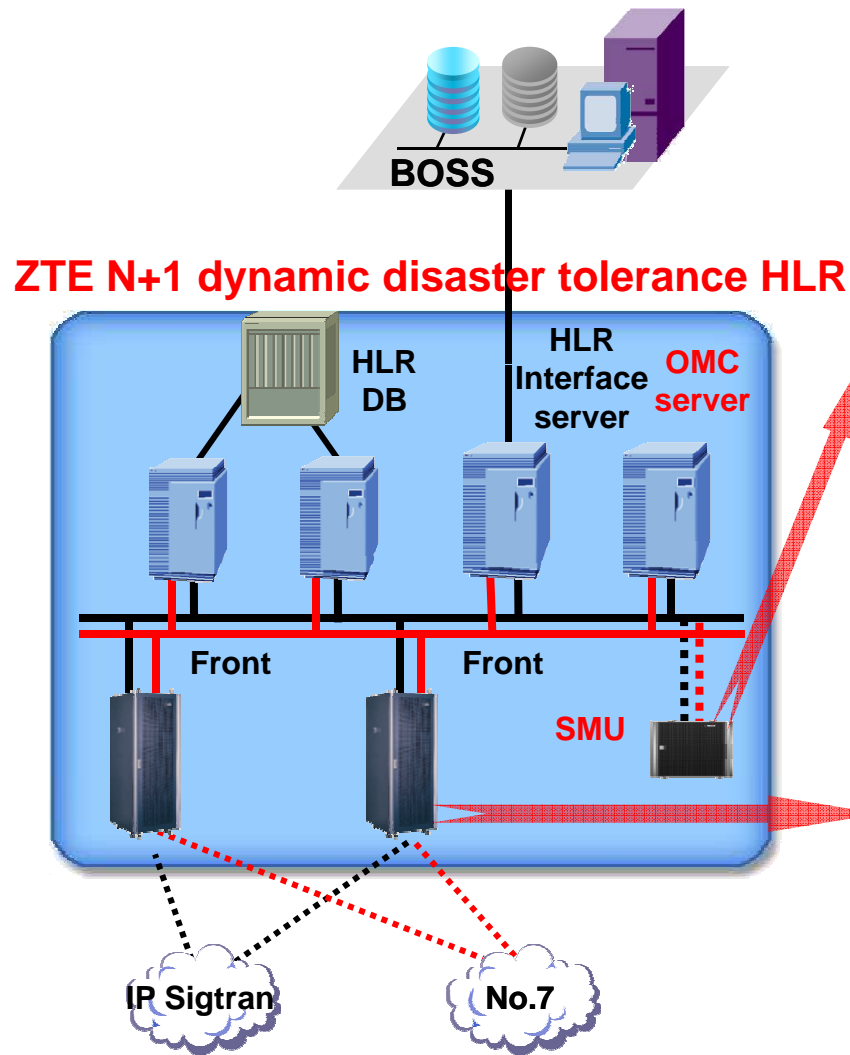
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HLR Redundancy

Dynamic syc.

Mutual Backup

HLR 1
50% service

HLR 2
50% service
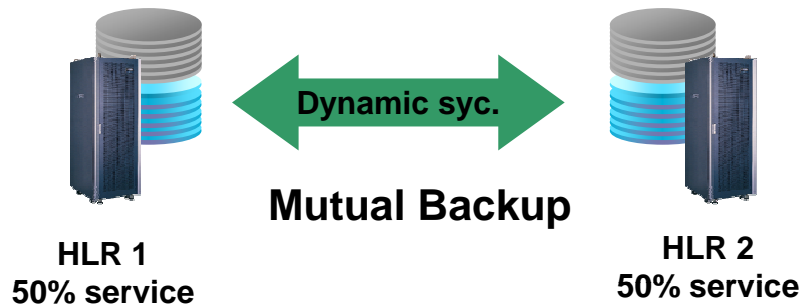
◆ Mature 1+1 mutual backup redundancy

◆ World widely deployment

**N+1 redundancy**

BOSS

- - - redundancy

Static data

◆ Mature N+1 redundancy

◆ Deploy in N0.1 operators like CMCC

HLR 1

HLR 2

HLR 3

HLR N

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N+1 Dynamic Disaster Tolerance HLR

BOSS

ZTE N+1 dynamic disaster tolerance HLR

HLR DB

HLR Interface server

OMC server

Front Front

SMU

IP Sigtran No.7

Disaster tolerance HLR SMU

| I N L P | O M P | U I M | S P B |

SMU can be laid anywhere

Disaster tolerance HLR

| S M P | S M P | S M P | S M P | S M P | S M P | S M P | S M P | U I M | U I M P | O M P | O M P | C L K | C L K | S M P | S M P |

| U S I | U S I | S I P I | S I P I | S I P I | S I P I | S M P | S M P | S P B | U I M | U I M | S P B | S P B | S P B | S P B | I N L P | I N L P |

IP Signal NO.7 Signal

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ZTE USPP solution

◆ **Service is processed in distributed nodes, and every nodes 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.**
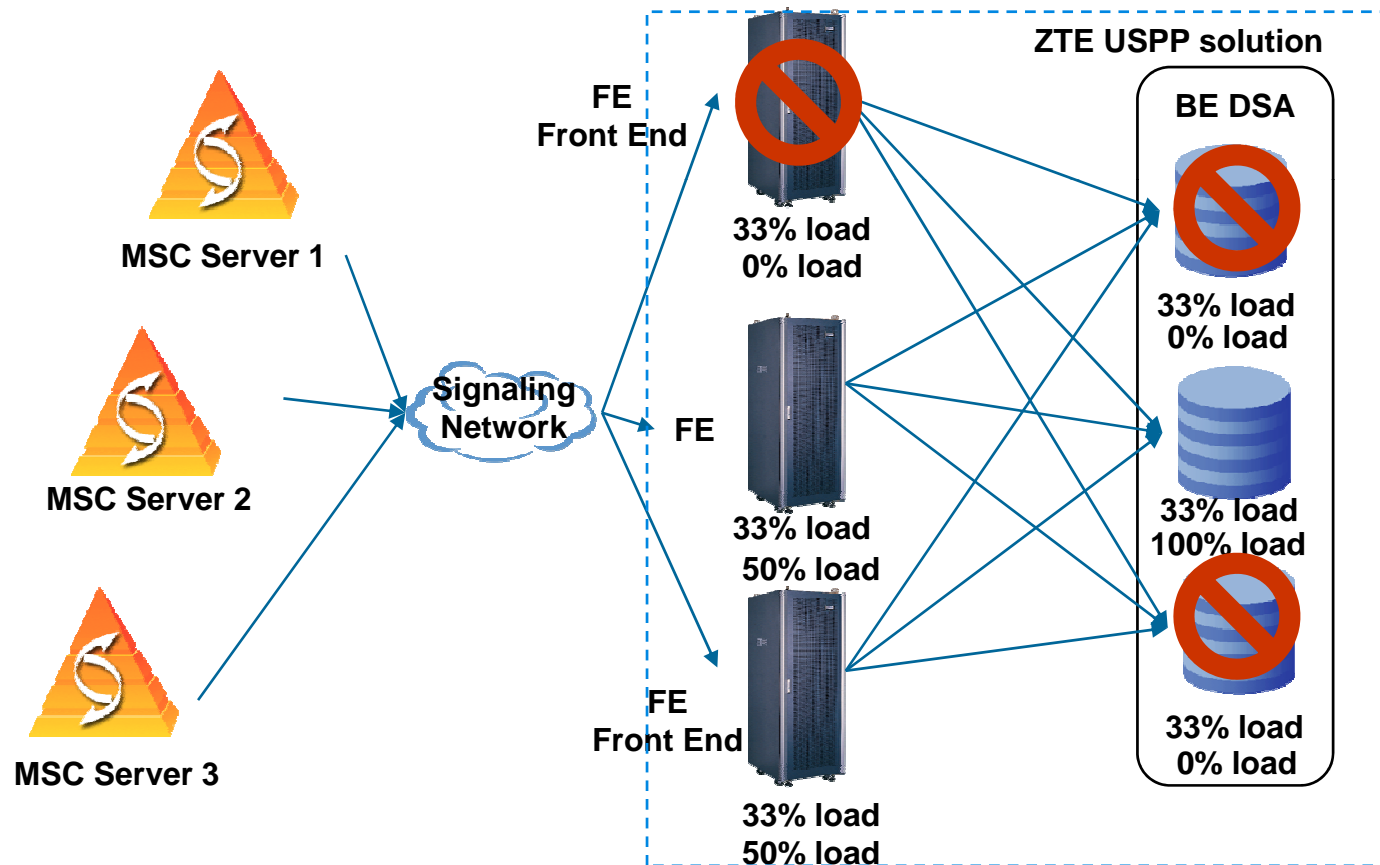
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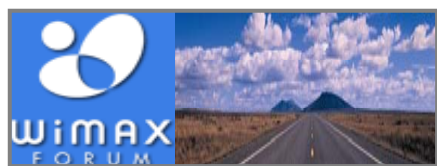
ALL-IP PLATFORM

Mobile network reliability issues

WiMAX

ZTE и WiMAX

🔵 **1st Chinese company to join the WiMAX Forum. ZTE is one of the original WiMAX Forum Board members**

🔵 **One of the first major telecomm 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**

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Global R&D Matrix of WiMAX

USA San Diego: **Core Tech, Standards**

Tianjin: NEW BASE
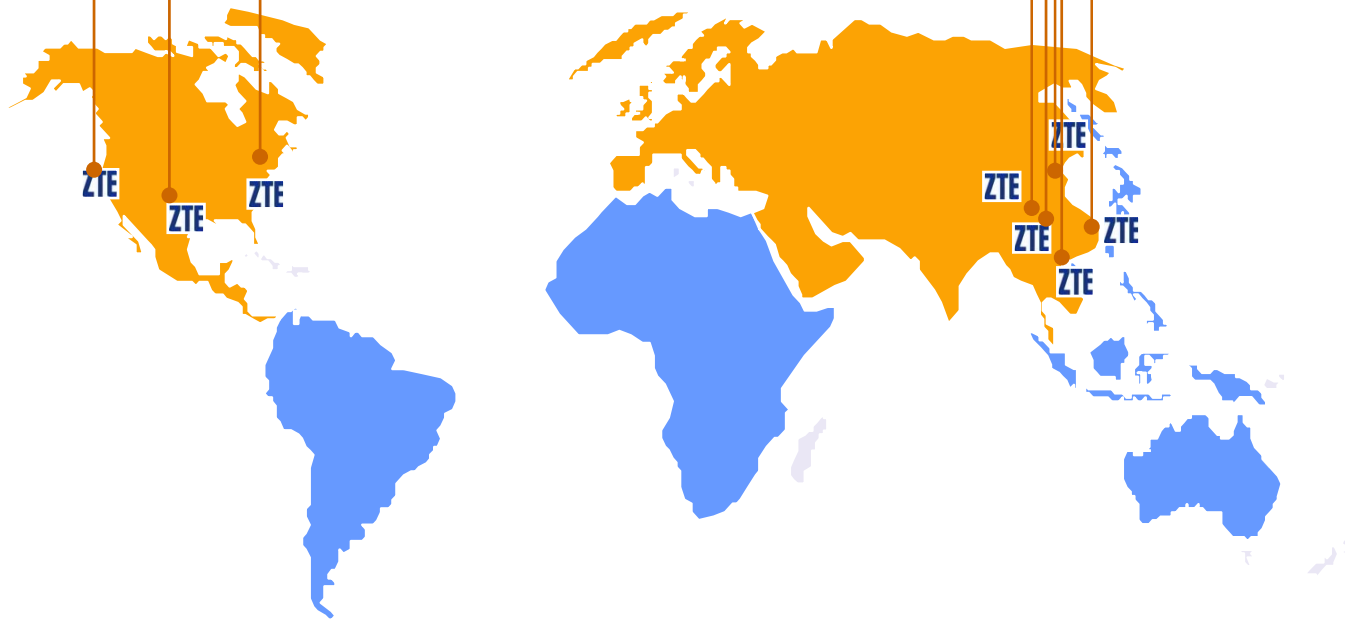
USA Dallas: **ZTE USA HQs, IMS**

Nanjing: **CSN, APP**
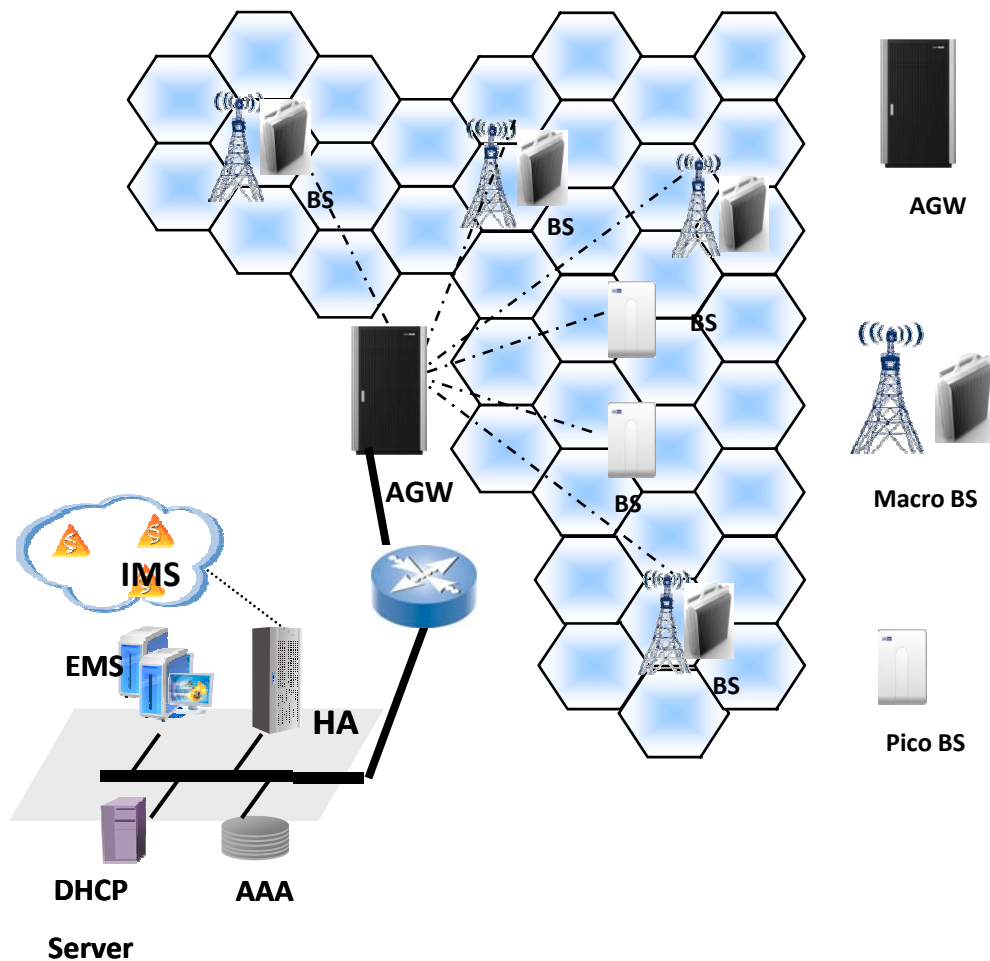
Xi'an: **RF, Simulation, Cards & Modem**

Shanghai: **Handsets**

USA New Jersey : **NGN, Terminals**

Shenzhen: **WiMAX HQs**
ASIC, BB, OMC

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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**
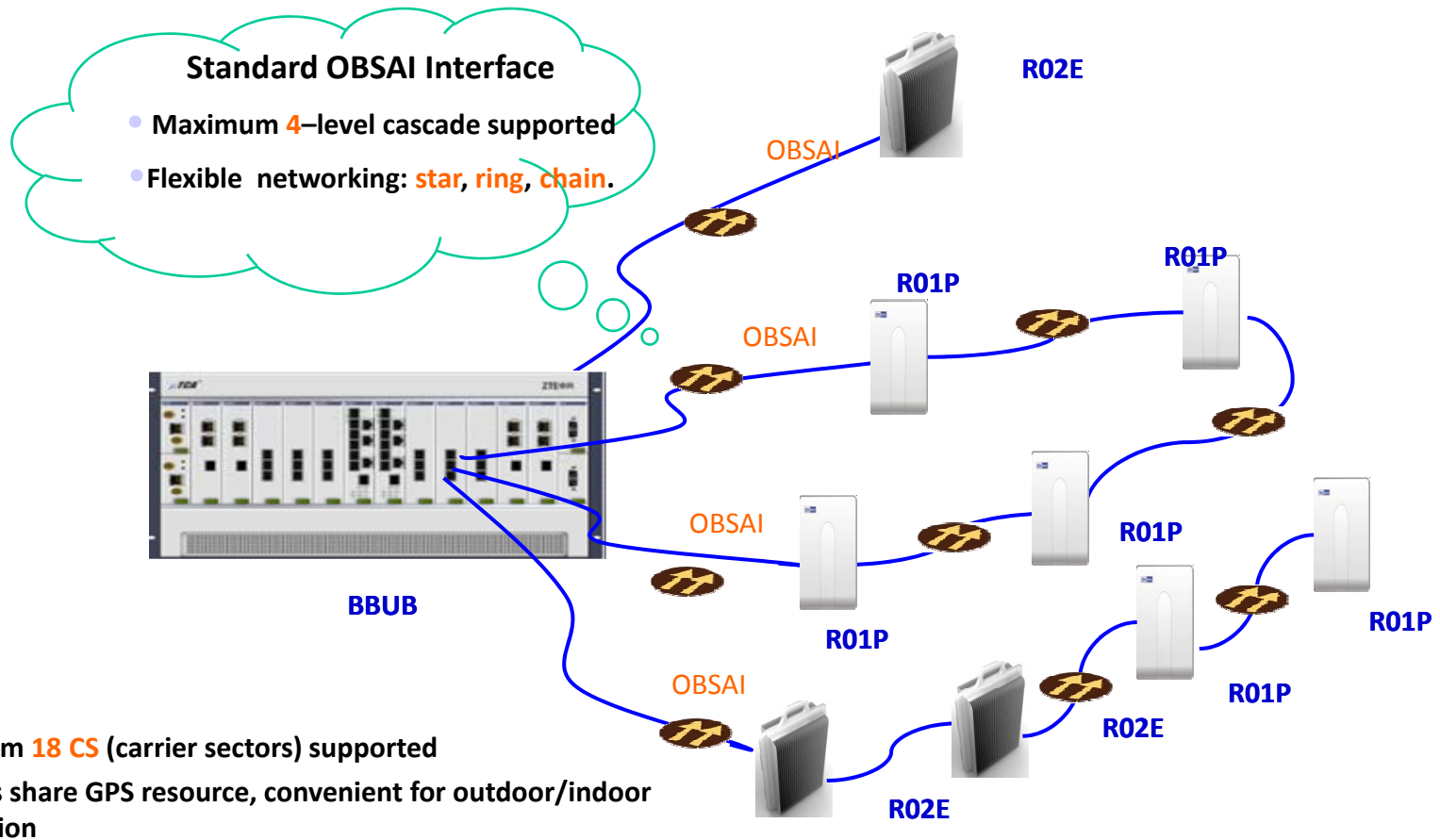 - **For outdoor Macro BS, usually 20~40m feeder needed**
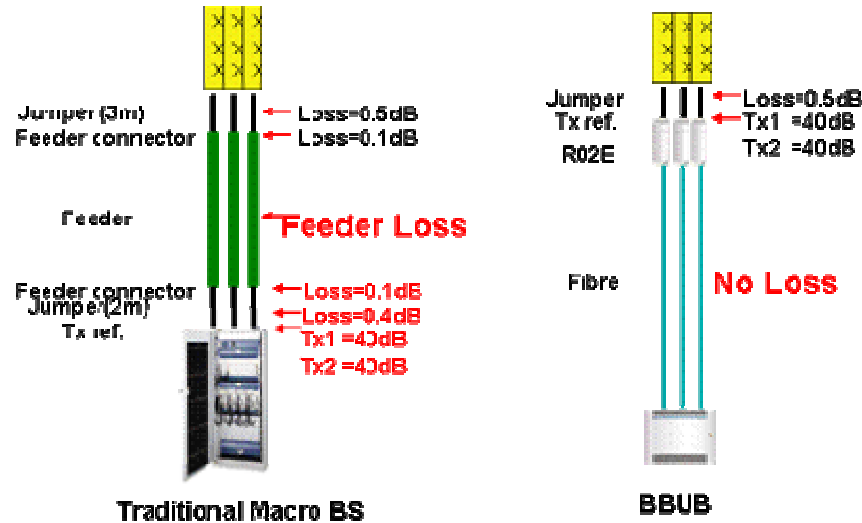
- **Reduce cost for BS equipment by 20-30%**

- **Reduce site cost (civil work, site aquisition) by 20-30%**

- **Reduce site operating and maintenance cost by 20-30%**

Traditional Macro BS: Jumper (3m), Feeder connector, Feeder, Feeder Loss, Feeder connector, Jumper (2m), Tx ref. — Loss=0.5dB, Loss=0.1dB, Loss=0.1dB, Loss=0.4dB, Tx1=40dB, Tx2=40dB

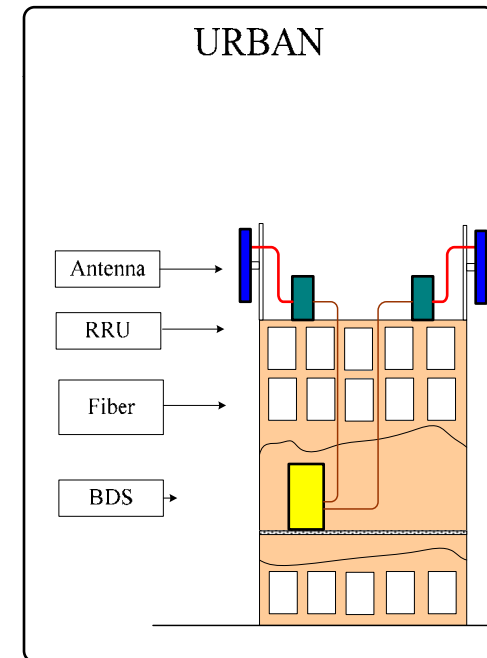BBUB: Jumper Tx ref. R02E, Fibre, No Loss — Loss=0.5dB, Tx1=40dB, Tx2=40dB

Better coverage decreases CAPEX & OPEX

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Flexible networking

Standard OBSAI Interface

- Maximum **4**–level cascade supported
- Flexible networking: **star**, **ring**, **chain**.

OBSAI

R02E

R01P

R01P

OBSAI

BBUB

OBSAI

R01P

R01P

OBSAI

R01P

R01P

R02E

OBSAI

R02E

R02E

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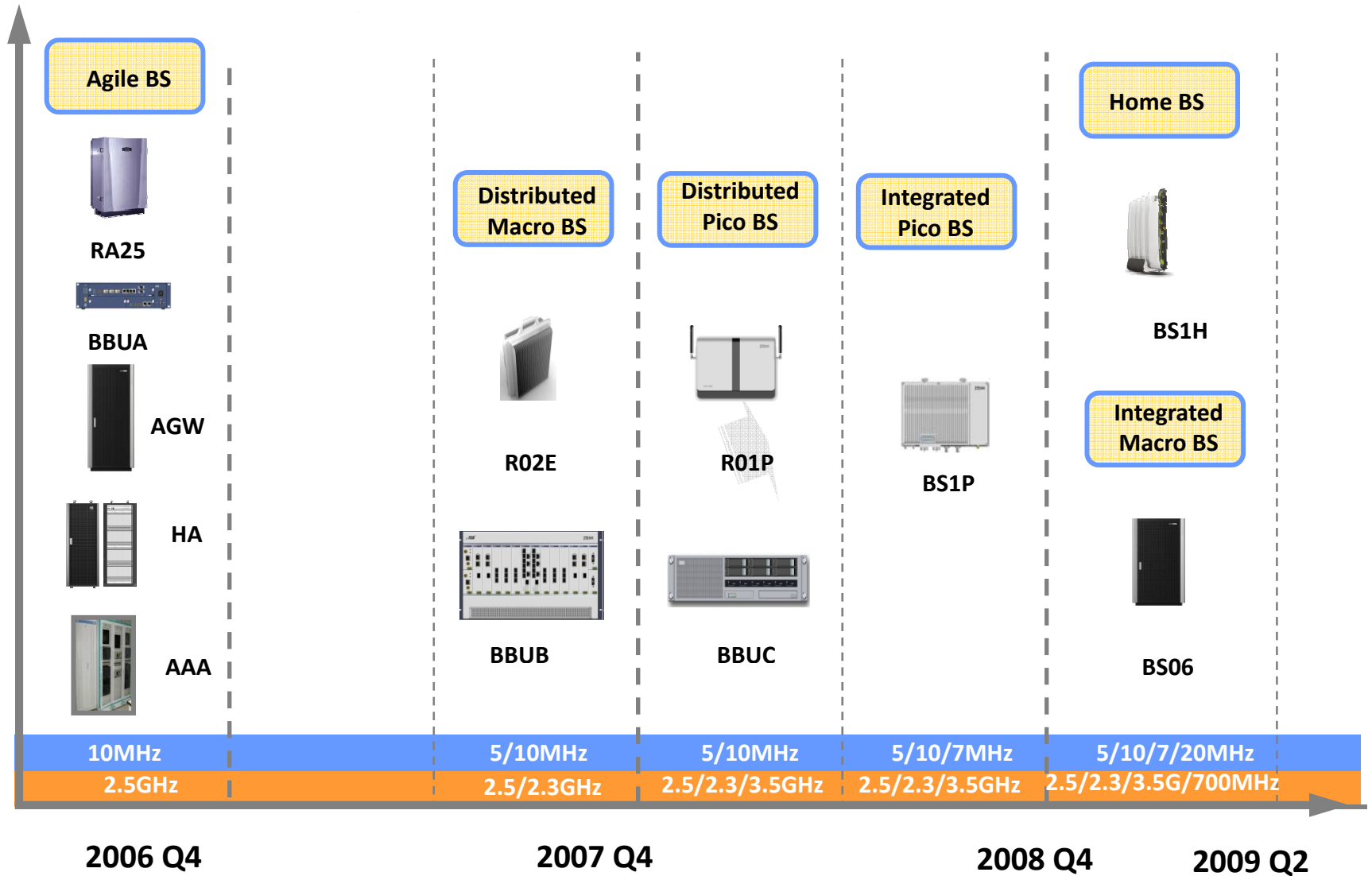
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Cell Site Deployment Options

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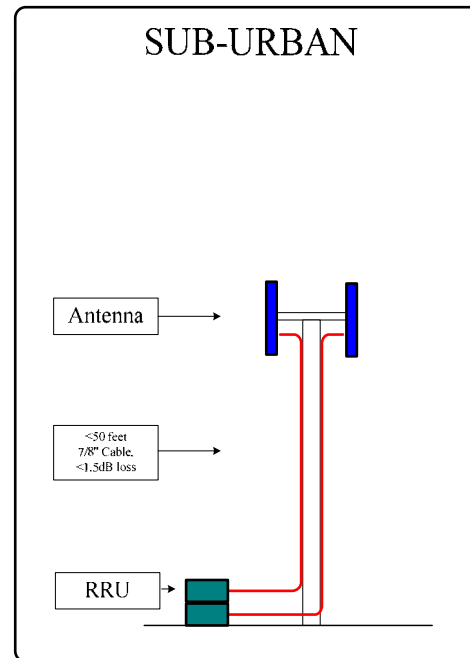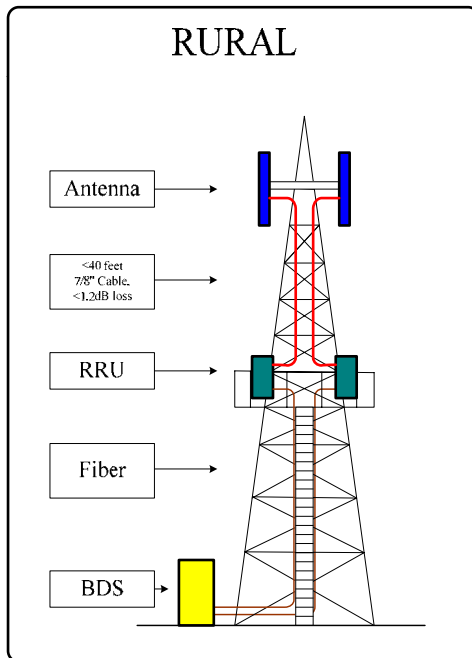
ZTE WiMAX System Roadmap

Agile BS

RA25

BBUA

AGW

HA

AAA

Distributed Macro BS

R02E

BBUB

Distributed Pico BS

R01P

BBUC

Integrated Pico BS

BS1P

Home BS

BS1H

Integrated Macro BS

BS06

10MHz	5/10MHz	5/10MHz	5/10/7MHz	5/10/7/20MHz
2.5GHz	2.5/2.3GHz	2.5/2.3/3.5GHz	2.5/2.3/3.5GHz	2.5/2.3/3.5G/700MHz

2006 Q4   **2007 Q4**   **2008 Q4**   **2009 Q2**

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Thank you!

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