



中国移动通信

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Network Management of China Mobile

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China Mobile Network Management Center

Agenda

- ❑ Challenges of Network Management for China Mobile
- ❑ China Mobile OSS Strategy and O&M Architecture
- ❑ China Mobile network Management and all NMS introduction
- ❑ What we have done in the standards internationally





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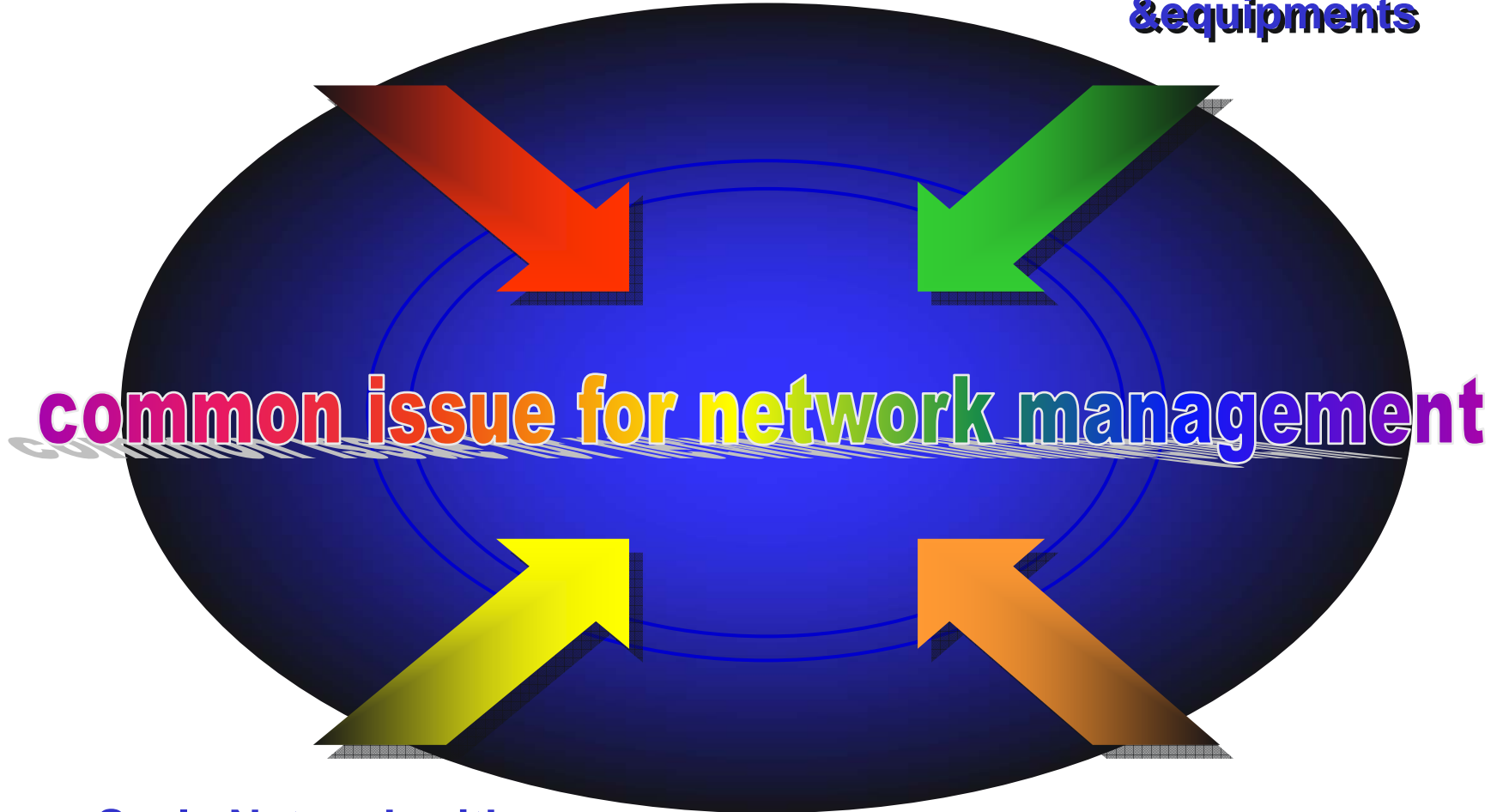


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Ever-Growing & varying for Services

**Multiple Vendors
& equipments**



**Large Scale Network with
Complex Network Structure**

Ever-complicated network management



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Convergence of Networks

Voice/data/Imaging/vidio

Communications
& Computers

Customers
access/Lease
Private line/
last mile access

Convergence?

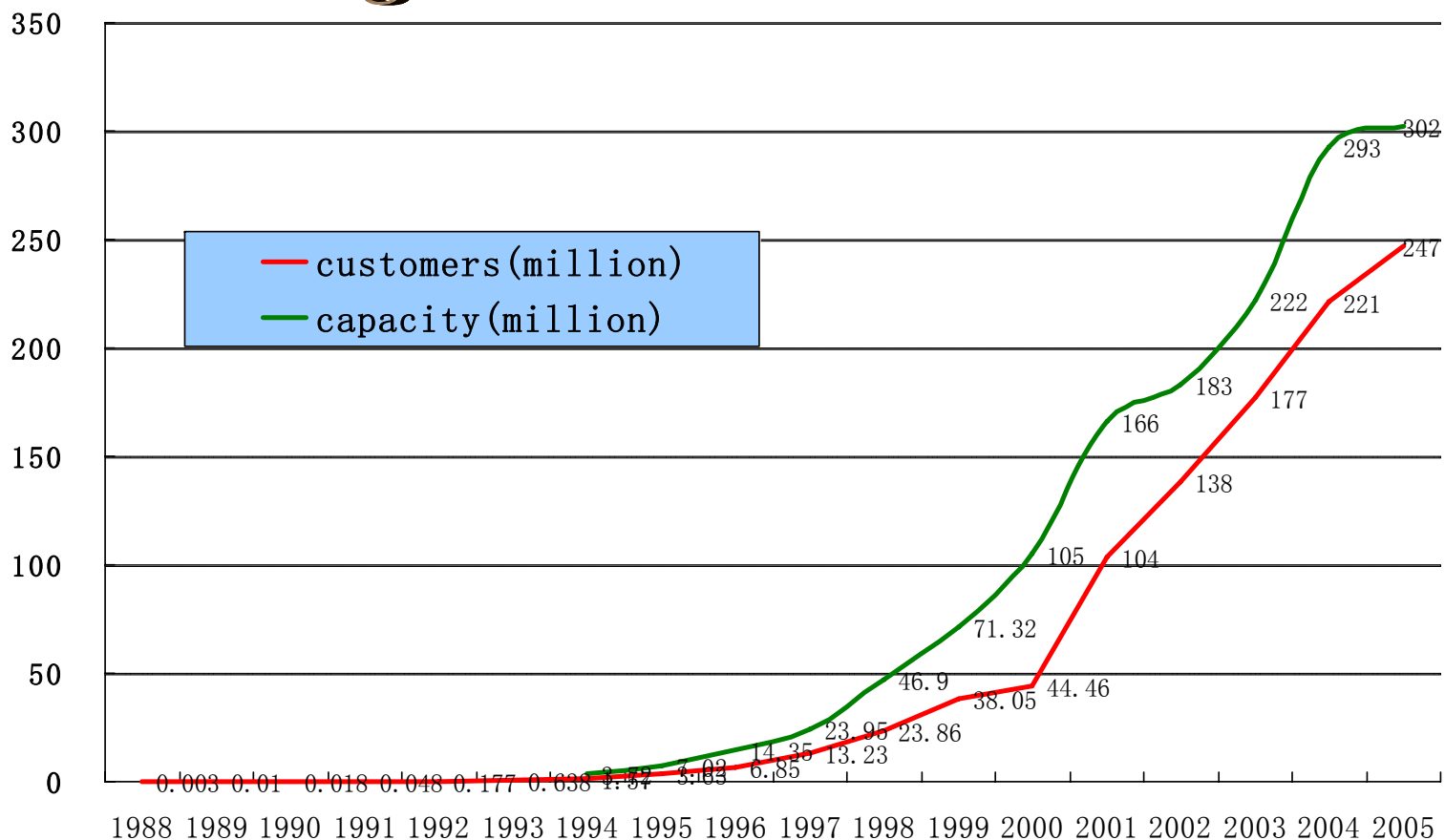
OSS, BSS &value added
services

PSTN & IP

Wire and Wireless



Increasing network scale of CMCC

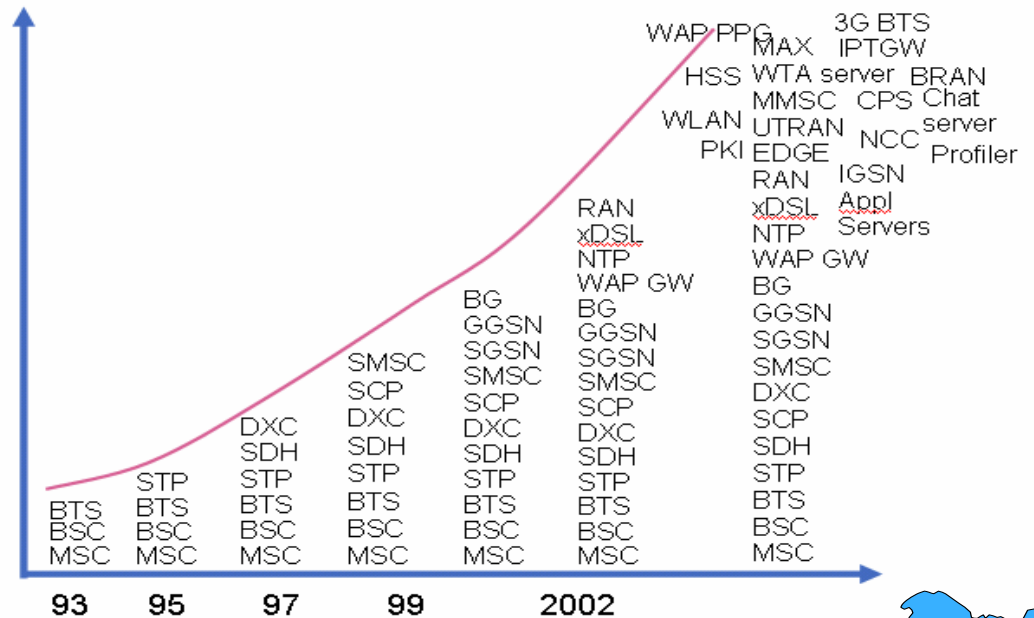
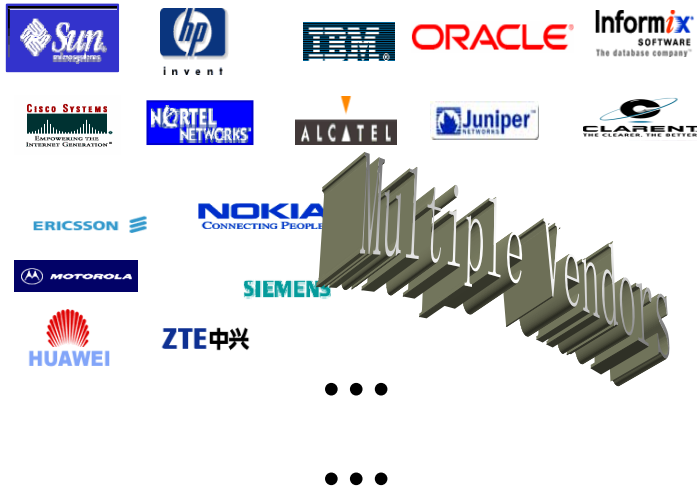




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Challenges of China Mobile For O&M ,OSS

- largest subscribers in the world
- Complicated Network Result from Ever-Growing Services
- Multiple Vendors
- Multiple Types of Network Elements
- Multiple Private Interfaces



- Large Scale Network with Complex Network Structure Caused by Unbalanced Economic in Different Regions.
- Management Heavily Depend on Vendor's OMC
- Lacking Commercial Professional NMS Tools





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Multi-vendors of CMCC



Complicated
device
resources.

How to
manage?

ERICSSON

NOKIA
CONNECTING PEOPLE

MOTOROLA

SIEMENS

Informix
SOFTWARE
The database company™

CISCO SYSTEMS
EMPOWERING THE
INTERNET GENERATION™

NORTEL
NETWORKS

ALCATEL

Juniper
NETWORKS

ORACLE®

Sun
microsystems

hp
invent

IBM

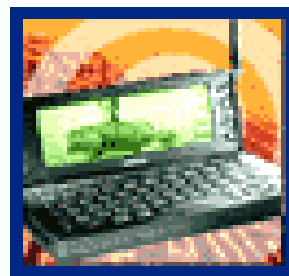
HUAWEI

ZTE中兴

.....

Variety services of CMCC

- SMS. MMS. WAP
- GPRS/WLAN
- Color Ring (customized ring)
- IP telephone
- E-tone online
- M-box
- M – Banking
- Mobile Mailbox
- Prepaid card
- IM
- KJAVA





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The Current Limitation of OSS

- ◆ Many OSSs - tightly coupled with network infrastructure
- ◆ OSS development always lags behind network development
- ◆ High level of complexity in OSS strategy due to a large number of systems and rapidly evolving network product offerings
- ◆ Potential for inflexibility in integration with new network components and new system components
- ◆ Typically long lead time and high cost for system development
- ◆ Insufficient and inconsistent presentation of management information for logical layers.
- ◆ Network Element resource limits are not sufficiently alarmed or known (in some instances).

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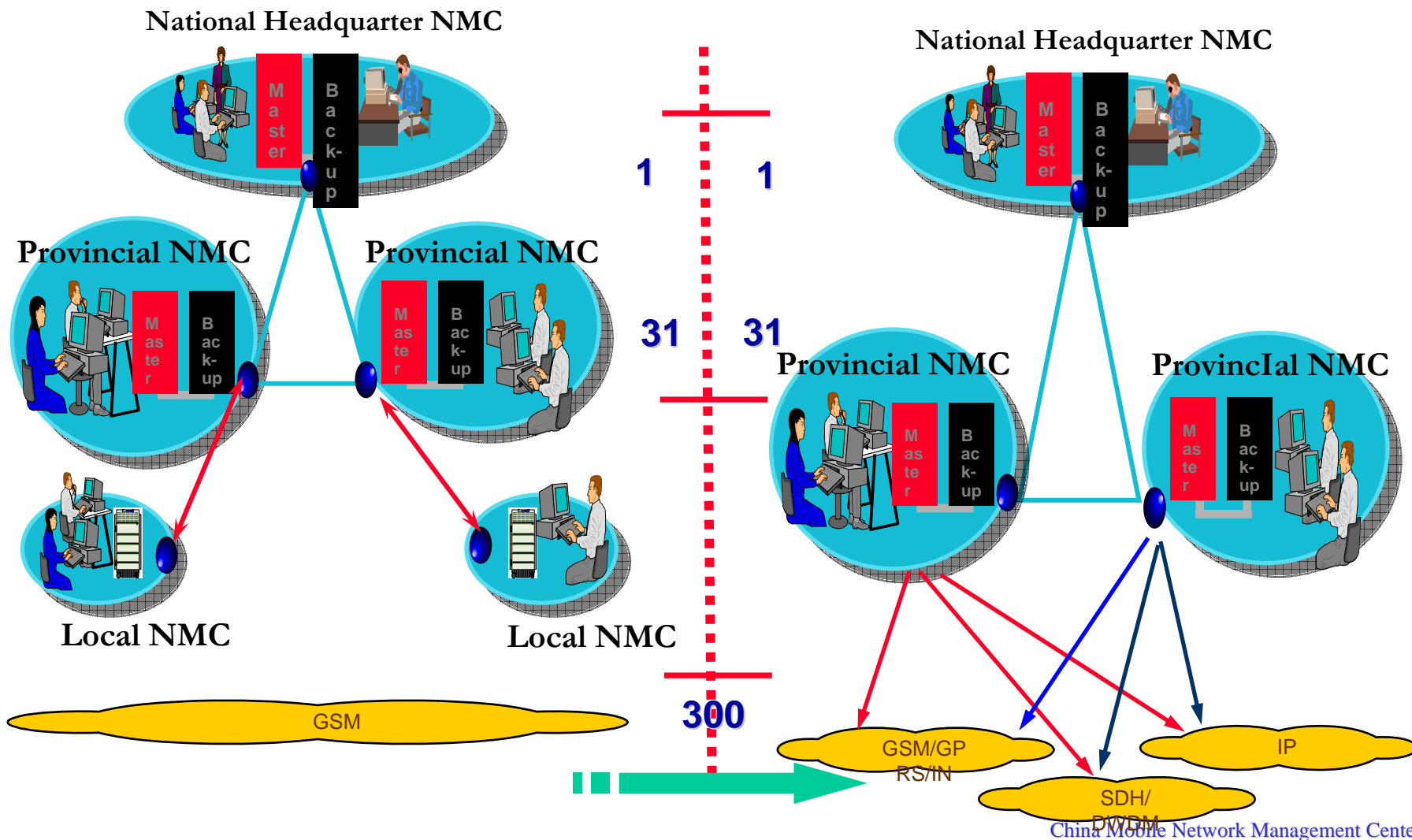


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Evolution of China Mobile O&M Architecture

3 level NMS

to 2 level NMS





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Centralized Management

HQ Network
Management

International &
Inter-provincial Network

Monitoring
Analysis
Provisioning
Traffic Controlling
Troubleshooting

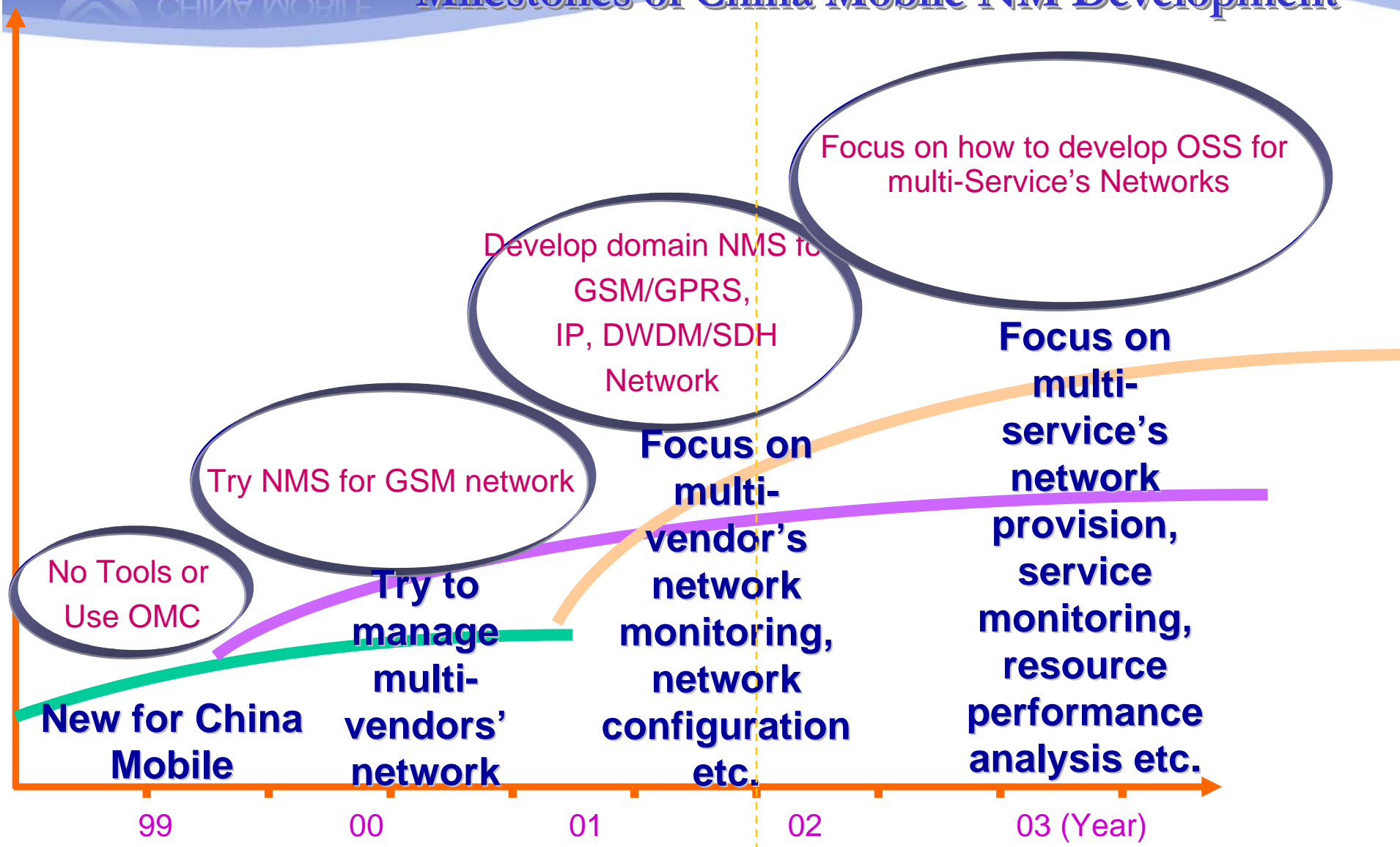
Provinces Network
Management

Provincial Network

Monitoring
Analysis
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Troubleshooting

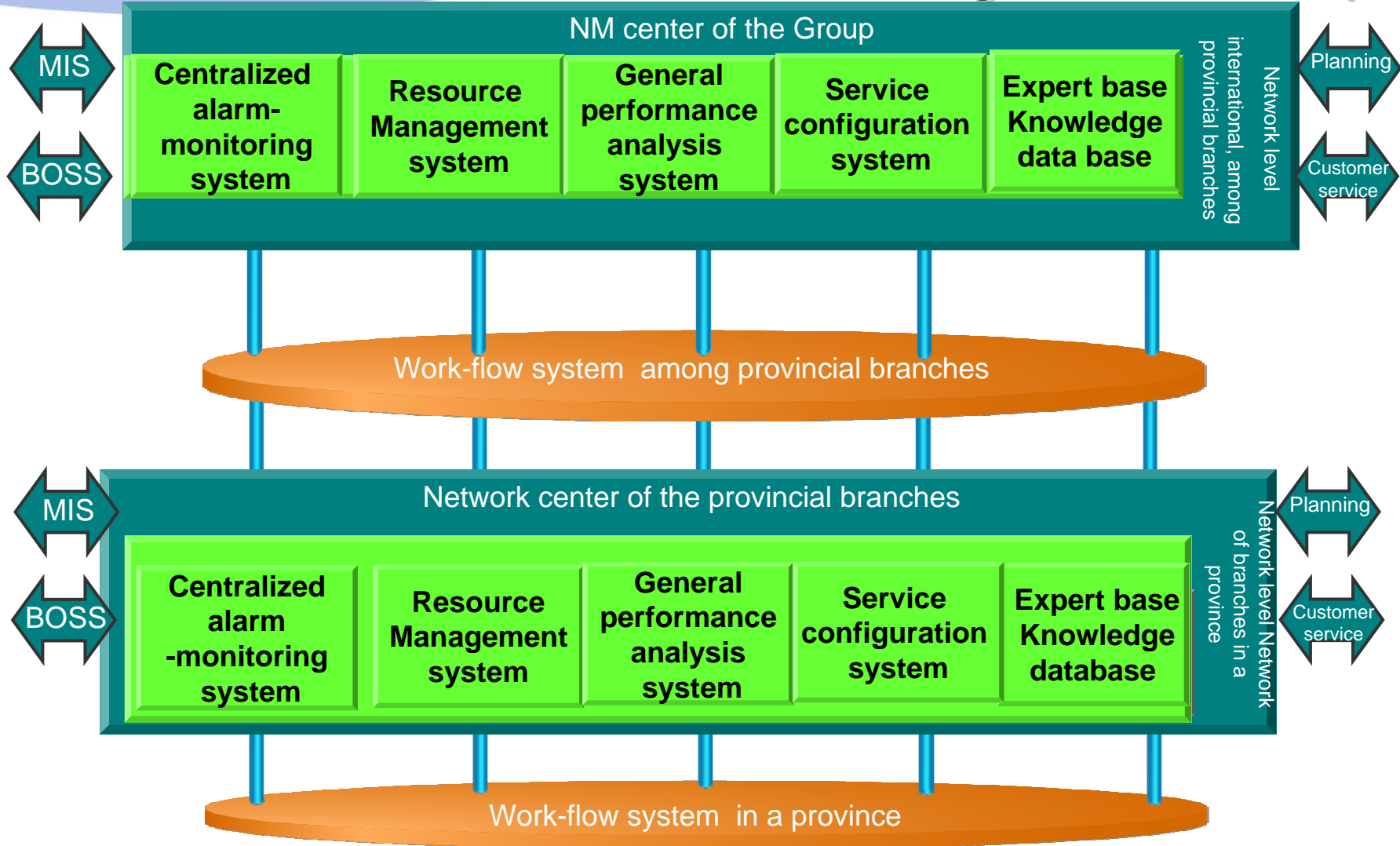


Milestones of China Mobile NM Development





Architecture of China Mobile Network Management Related System





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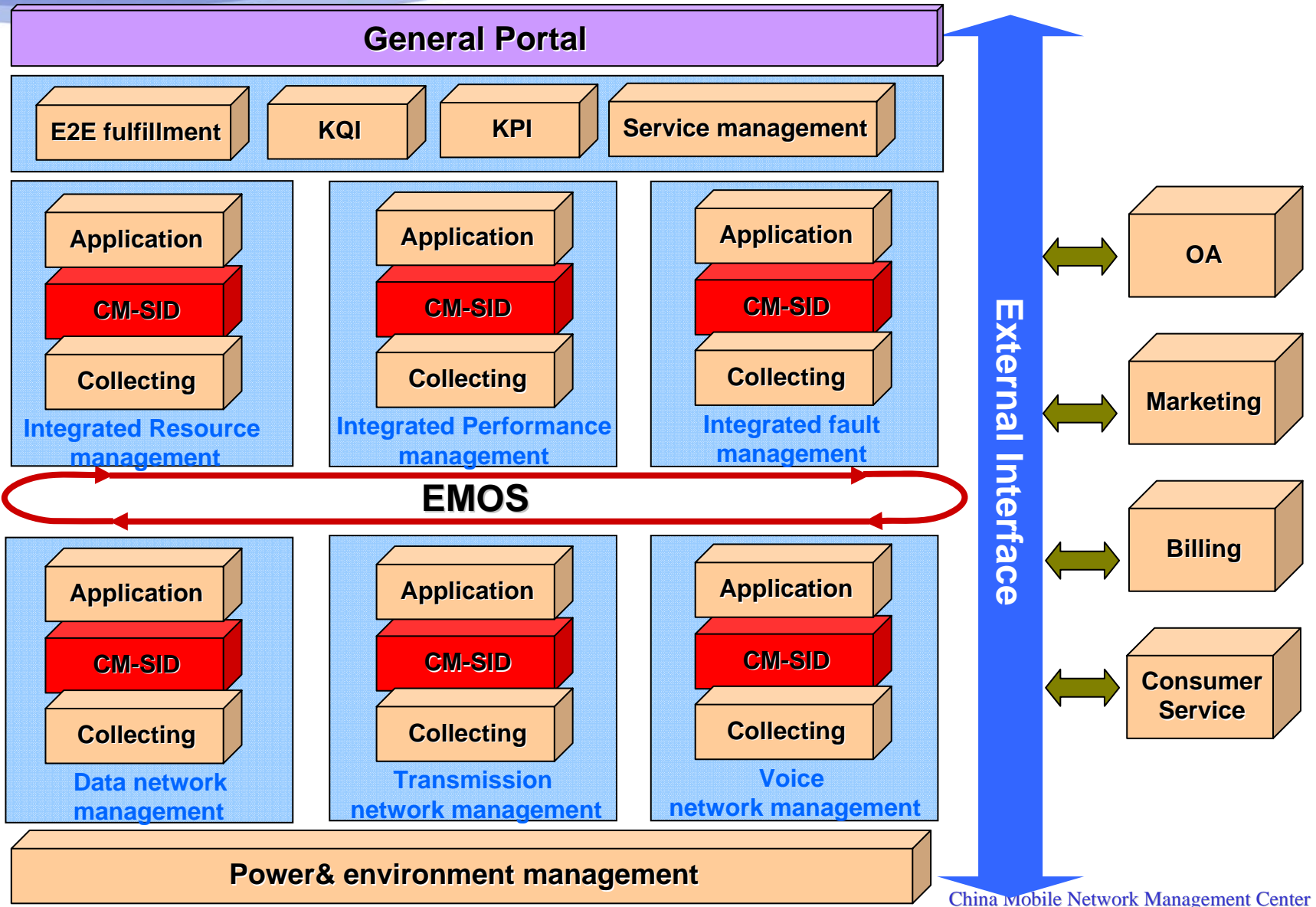
About OneOSS of CMCC

- **Open, *Next_Generation oriented* , Evolutional Operational Support System**
- ***OneOSS characteristic:***
 - ◆ Have nothing to do with managed element
 - ◆ From system function structure to system technology structure
 - ◆ Structured、Shared、Hierarchy、Contract、Can be custom-made
 - ◆ Unified flow、Unified interface、Unified data model、Unified portal
 - ◆ Based on existing system、holistic planning and consideration



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CMCC OneOSS Framework





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Experience & Activity

- Participating in ITU-T/ 3GPP, then push equipment interface standard**
- By configuration data modeling and automatic executing , enhance efficiency in data network management area**
- Based on resource modeling, achieve the unified end-to-end dispatch and management in transmission network management area**
- Implement the alarm correlation analysis in voice network management area**
- According business monitoring, enable fault localization and fast fault solve**

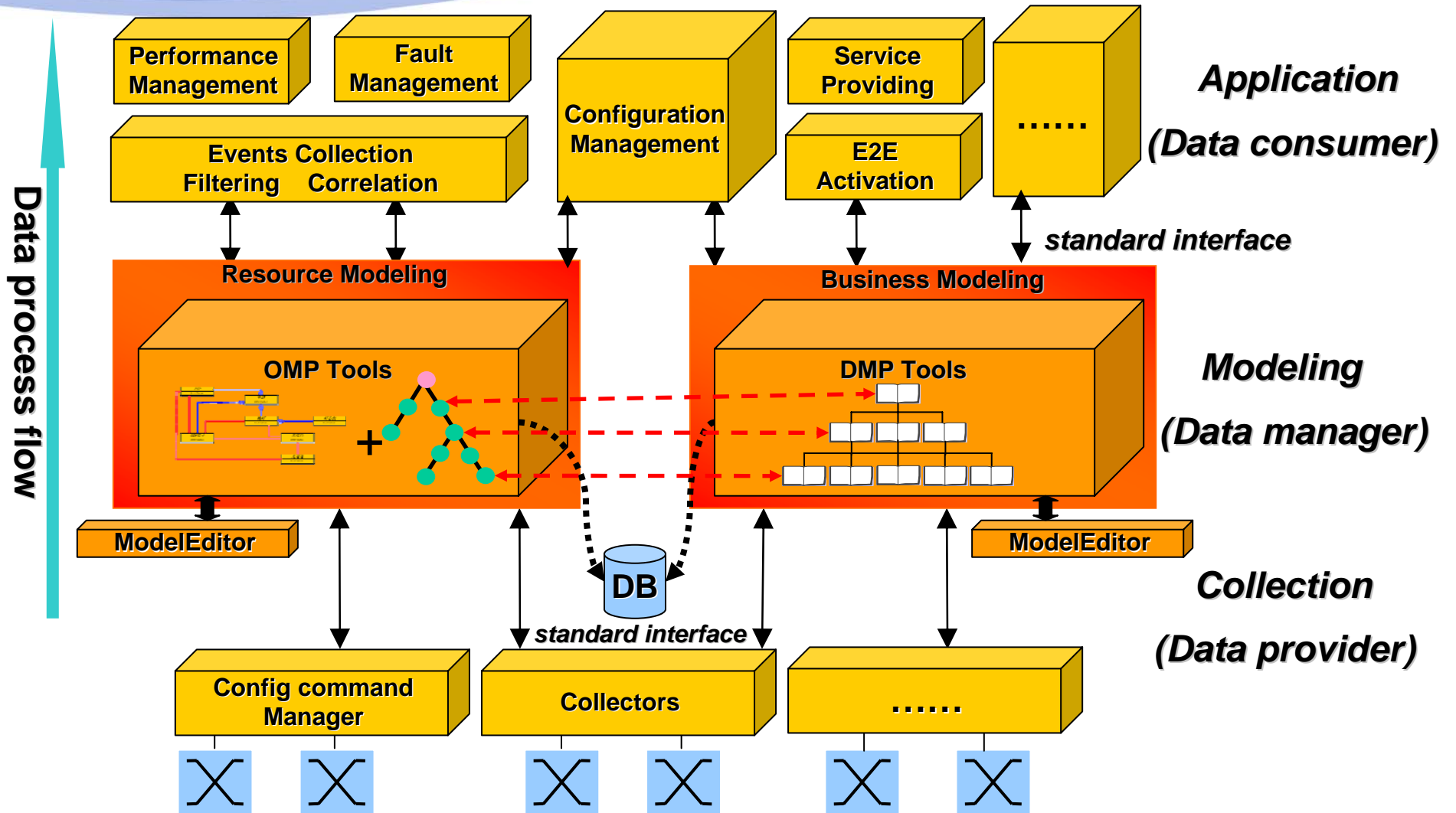


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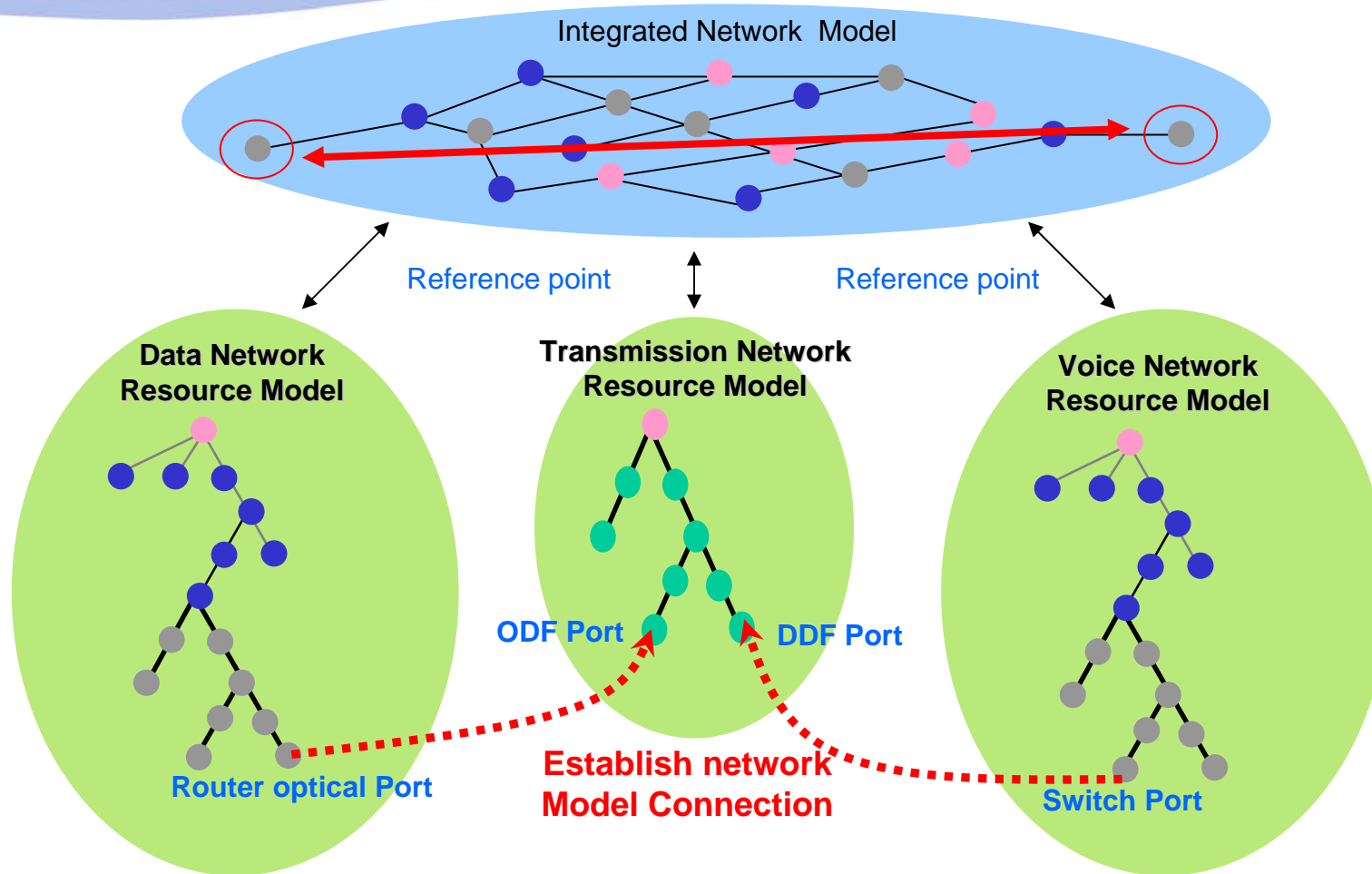
Benefits

- ❑ Reduce effect between layers when changing occurs
- ❑ Support the individuation management needs
- ❑ Making a loosen coupling system
- ❑ Enable system growable , Can be iterated
- ❑ More easily integrated and systems are quicker to upgrade
- ❑ More stamina to focus on business logic



Characteristic:

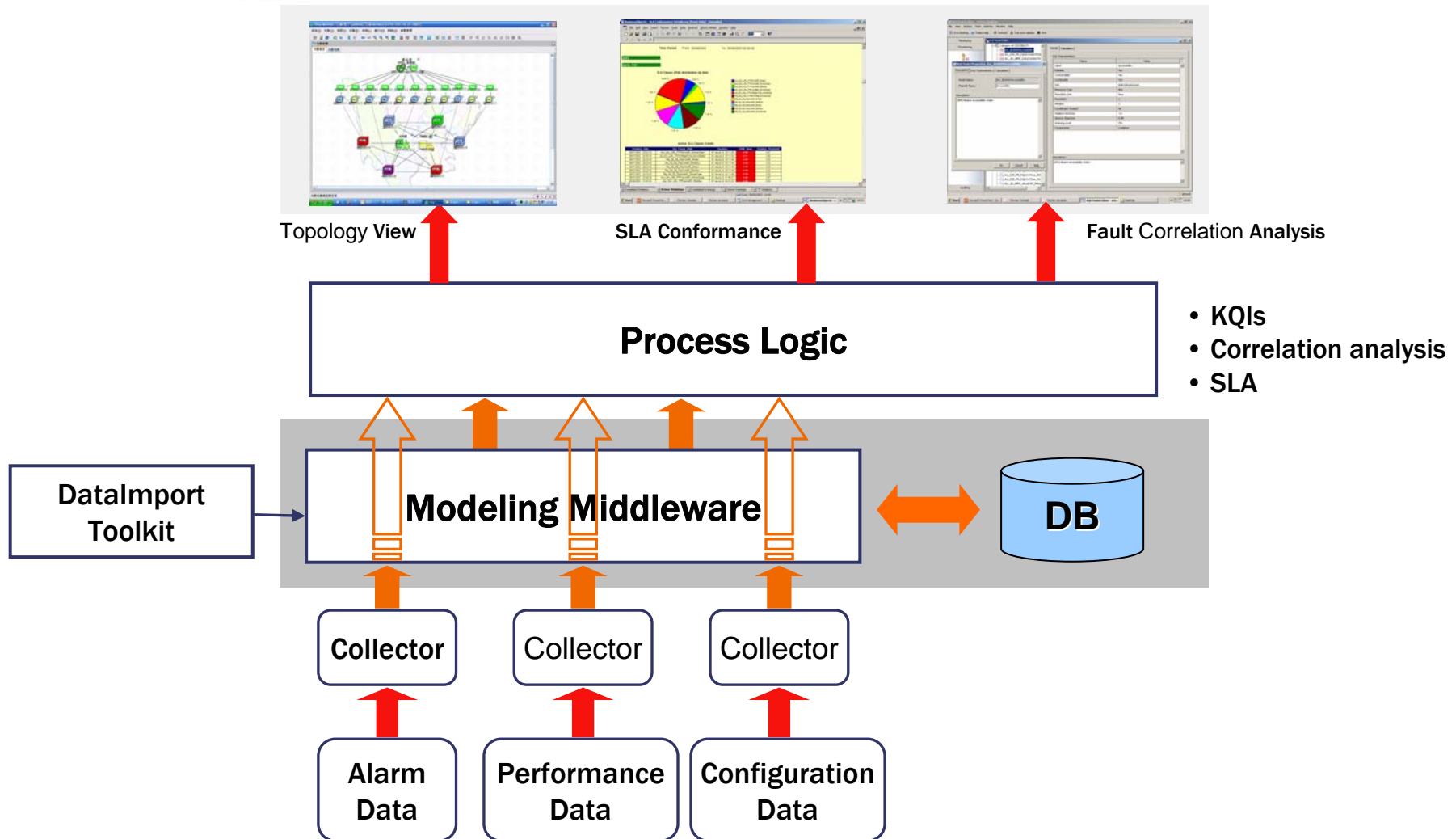
Hierarchy, Modeling, Shared data&info, Contract Interface, and Separated business entity and process flow



Integrated network model is based on specialized model. It enable end-to-end service activation to be achieved cross multi-network.



Applications Supported





Model-driven Application Example

The screenshot displays the Omp Monitor interface. The main window shows a network topology diagram with various components like '话务业务分组', 'DSMP', 'IDC子系统', 'WLAN业务系统', 'STP组', 'CDH1/H2/L1/L2', '摩托罗拉 GPRS 业务组', 'CMNET', and '华为软交换'. A context menu is open over the 'TMSC' component, listing actions such as '维护关联关系', '创建组成对象', '更改对象图标', '查看对象属性', '放大', '缩小', '合适位置', '合适大小', '下一层', '树状展开', '展开', '多对象钻取', '钻取看连接', and '查看子网元告警'. A dialog box titled 'TMSC分组 TMSC分组 子节点告警列表' is also visible, containing a table of alarm data.

| 网元名称 | 告警标题 | 告警描述 | 首次发生时间 |
|------|----------------------|---|-------------------|
| 成都A1 | PROCESSINGERROR ... | START/5007*(2 9 3 2 0 0 7)*/1 M3100.net... | 2005-12-13 22:... |
| 成都A1 | COMMUNICATIONS AL... | START/1011*(1000 11)*/1 M3100.networkl... | 2005-12-14 00:... |
| 成都A1 | PROCESSINGERROR ... | START/5007*(2 9 3 2 0 0 7)*/1 M3100.net... | 2005-12-13 18:... |
| 成都A2 | COMMUNICATIONS AL... | START/1011*(1000 11)*/1 M3100.networkl... | 2005-12-14 00:... |
| 成都A2 | COMMUNICATIONS AL... | START/1011*(1000 11)*/1 M3100.networkl... | 2005-12-13 23:... |
| 成都A2 | COMMUNICATIONS AL... | START/1011*(1000 11)*/1 M3100.networkl... | 2005-12-14 00:... |
| 成都A2 | COMMUNICATIONS AL... | START/1011*(1000 11)*/1 M3100.networkl... | 2005-12-14 00:... |

Summary statistics from the dialog box:

- 严重: 0
- 主要: 0
- 次要: 18
- 警告: 13
- 未确定: 0
- 已清除: 0

Alarm Correlation
Alarm Analysis



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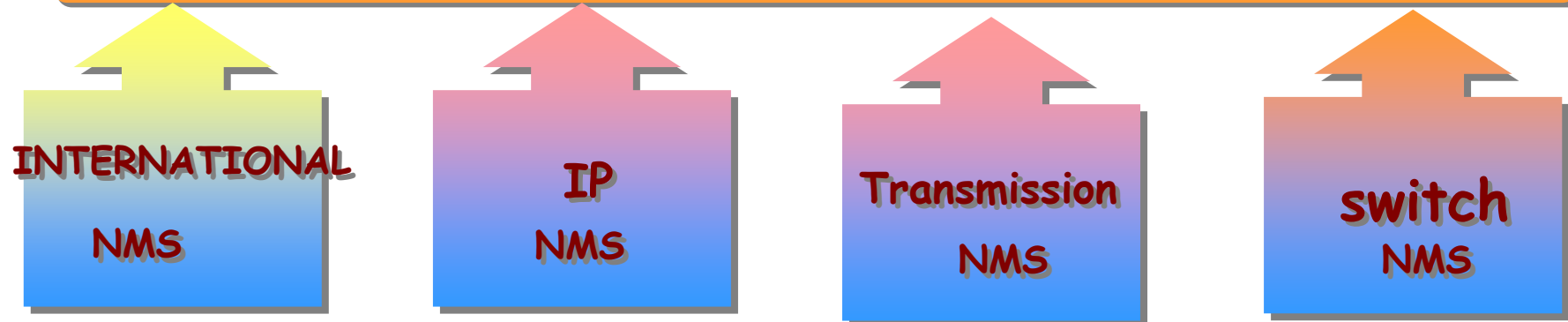
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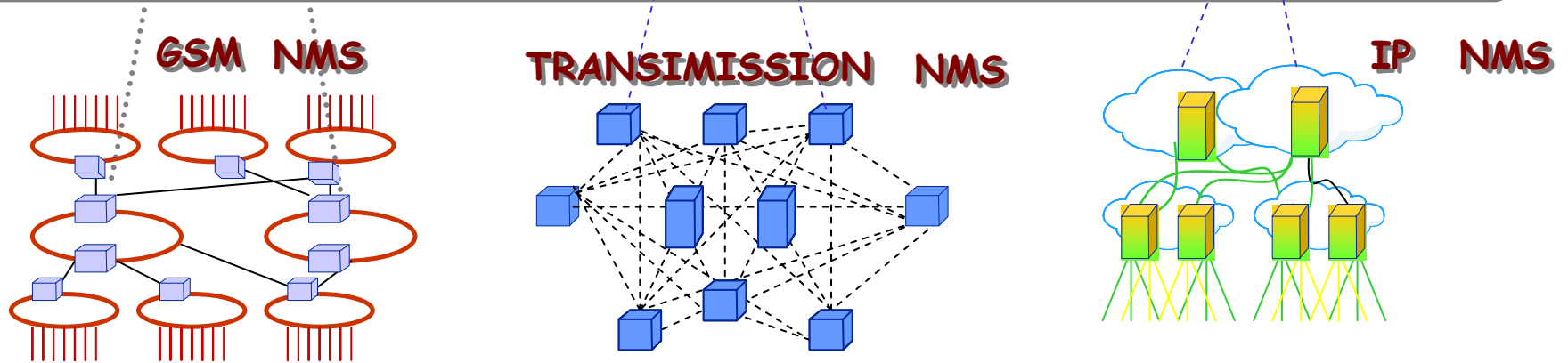
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Centralized management of the Network

Headquarter centralized NMS



Provincial centralized NMS

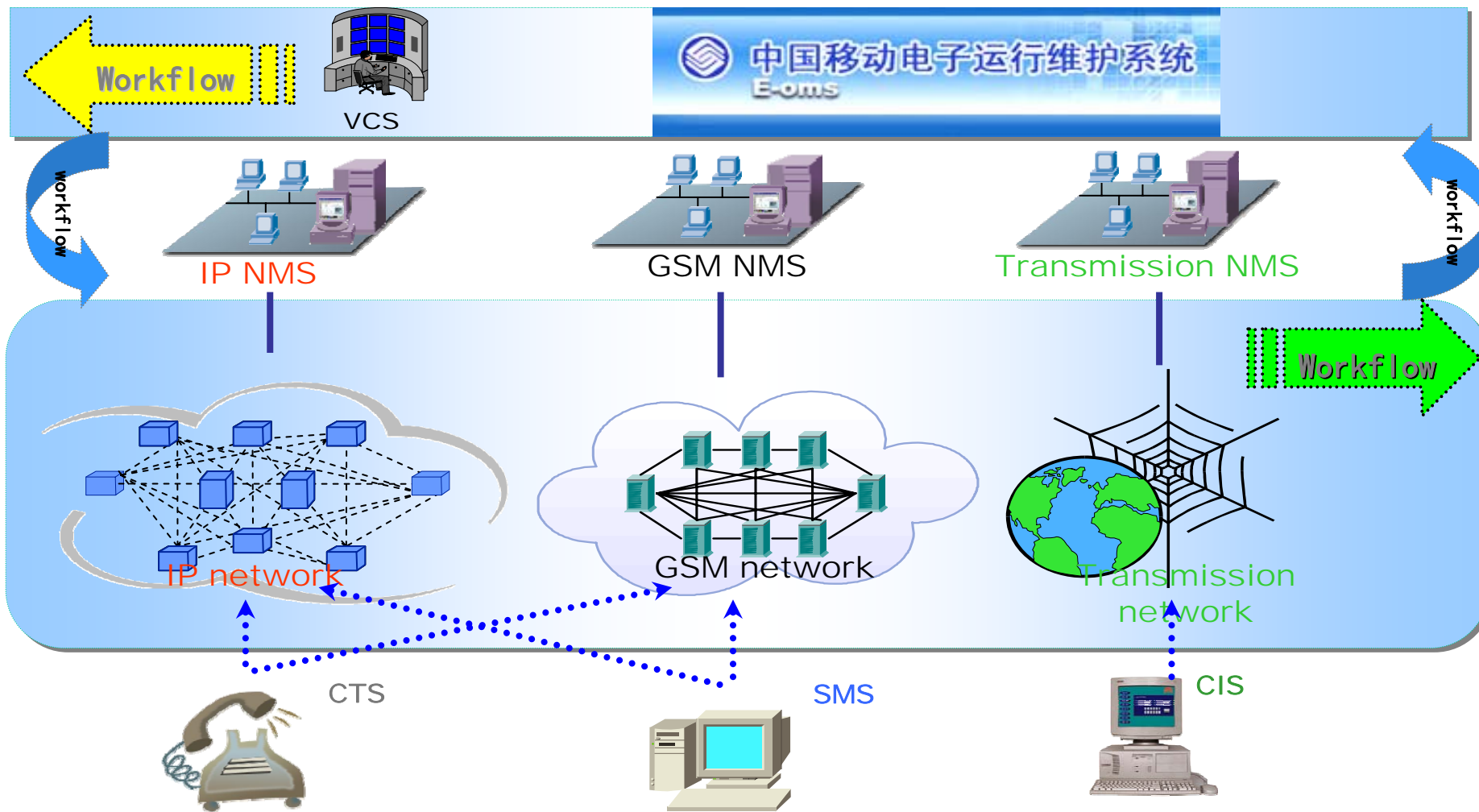




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China Mobile network management

— Structure of Network



China Mobile - Microsoft Internet Explorer

文件(F) 编辑(E) 查看(V) 收藏(C) 工具(T) 帮助(H)

WEB SITE FOR INTERNATIONAL SERVICE
CHINA MOBILE

地址(A): http://gsmroaming.chinamobile.com/forwardmain.htm

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Homepage Logout

News Management International Roaming Data Service IDD Management

Roaming Accept

| | | | | | |
|-------------------|---|------------------|---------------------|--------------|--------------|
| Ticket_NO | 117 | user | sgmobile1 | state | completed |
| E-Mail | chenj@m1.com.sg | Address | | | |
| Telephone | | Fax | | Mobilephone | +65 90054917 |
| Visit_City | Yunan Kunming | Last Submit Time | 2004-01-07 11:23:00 | Trouble Type | MOC |
| MSISDN | +65 92736260 | MSI | 525034370105454 | Attachment | |
| Brief Description | One of my customer had complained that when he is in Yunan province at KunMing, he had encountered problems in making calls back to Singapore fixed line and he is also facing various dropped calls incidents. According to information provided by customer, the network bar is full when dropped calls are encountered. Customer also claimed that calling to mobile line in Singapore no problem but with difficulties. Could you perform some tests with our test sim and the number provided. Try to speak to the fixed line people as customer claimed that the other party can't hear him. Fixed Line Num: +65 65403150, +65 65403152, +65 67436423 Customer Calling Num: +65-92736260 Time of problem: Any time Handset Model Nokia 6510 | | | | |
| Accept Time | 2004-01-07 14:38:00 | Resolve Time | 2004-01-09 17:07:00 | | |

Accept the trouble Resolve the trouble [Add Reply](#) [Transmit the trouble](#) [back](#)

The Resolved Time: 2004-01-09 17:07:00

The disposal result:

We have perform MOC testing in kunming successfully with your inbound SIM card/Feel free to contact us if you still have problem.

selectaffair1.jsp?countryID=all&len=34

Internet

GSMROAMING.CHINAMOBILE.COM

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What we have done in the standards internationally?

- *Active participate in the NM field work of ITU-T, TMF, 3GPP etc.*
 - ◆ *We have participated in the ITU-T SG4 work*
 - ◆ *We are TMF corporate member.*
 - ◆ *We play as an active role in 3GPP OA&M work. CMCC delegate works for 3GPP SA5 as vice chairman.*
 - ◆ *We play a very important role in CCSA , which are the standard organization of China government.*



ITU-T





Project Co-ordination Group

Technical Specification Groups (TSG's)



- Vice Chair of 3GPP SA and 3GPP SA5
- 14 Technical Specifications accepted by 3GPP SA5
- 53 Change Request accepted by 3GPP SA5
- Host 3 3GPP SA5 meeting in China
- Froze 3GPP R6 32.xxx OAM&P specifications in SANYA China



thanks !

谢谢!

沟通从心开始
Reaching out from The Heart