# PTCL Transit Planning Solution

PTCL-Huawei Network Planning Team

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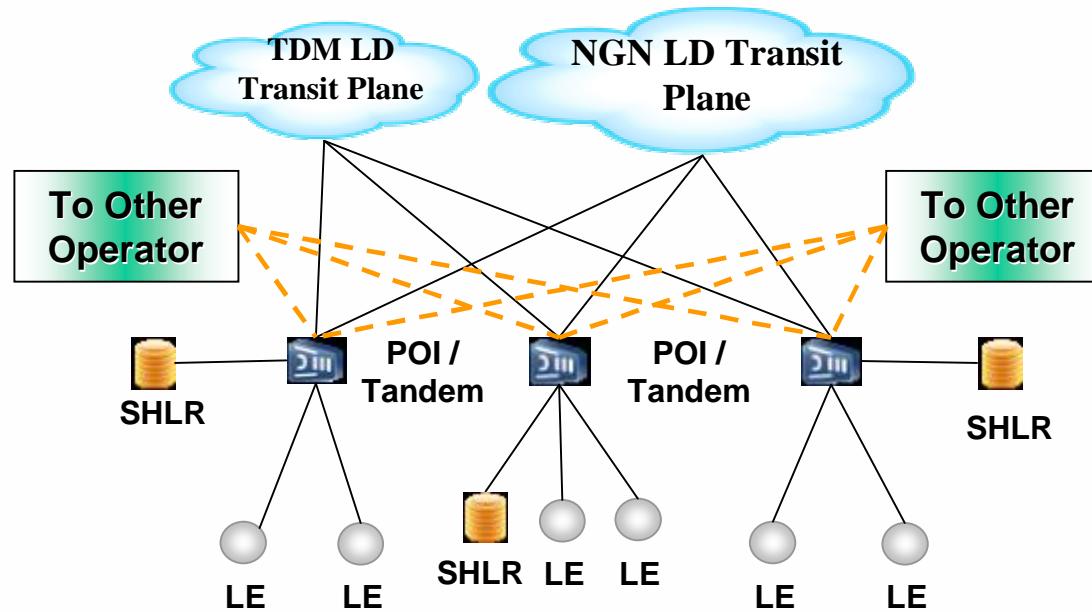
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- Based on analysis of PTCL current fixed network, Huawei suggest following migration solution from PSTN to NGN

  - ► **On transit layer** : migrating from coexistence of PSTN & NGN devices to IP-based pure NGN transit network

  - ► **For POI & Tandem layer** : Separate POI function from DTE to establish new POI layer based on MGW, at the same time, new POI act as local tandem. Connect SHLR to new POI to introduce network intelligence

  - ► **On local Exchange Layer** : choose some aged TDM exchanges to migrate to NGN.

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🔴 This slide is based on "PTCL POI Planning solution",

It means:

    ☞ All POIs will be constructed with MGW of NGN network

    ☞ Original POI function on DTE has been removed

    ☞ After that, DTEs have the same function with HCTE

CONTENT

- **Current PTCL Transit Setting**

- **General Transit Network Structure**

- **PTCL Transit Deployment Suggestion**

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PDF 文件使用 "pdfFactory Pro" 试用版本创建 www.fineprint.com.cn

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PTCL Current Telecom Area Partition

● **Description**:

  ► Call type identification will be based on distance calculation between exchanges

  ► Fixed calls are charged per 5 minutes.

● **Disadvantage**:

  ► **High OPEX** : Have to modify many exchanges' data to identify call type when new exchange is built.

  ► **Unclear network layer** : no clear boundary between local and long exchanges

LD Area 3

LD Area 2

LD Area 1

Local Area

25Km

25-80Km

80-160Km

>160Km
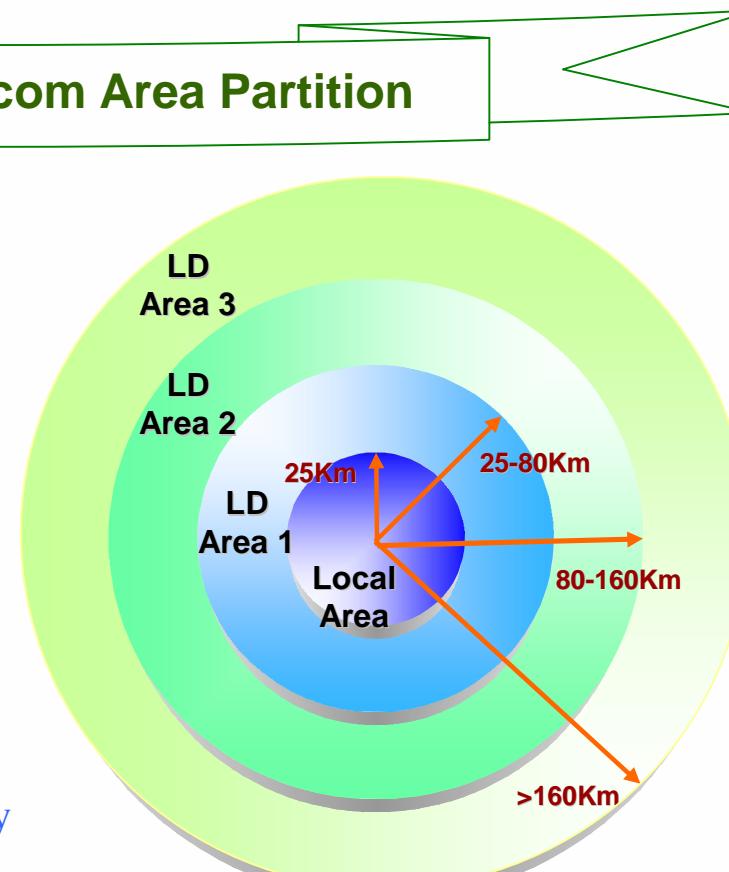
Note :
LD -- Long Distance

Telecom Area Suggestion: Construct hierarchic network based on telecom region/district partition

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To Other Operator

IGE   IGE

DTE   **HCTE**

**Long Distance
Transit Layer**

MGW

WLL   LE   LE   WLL   LE
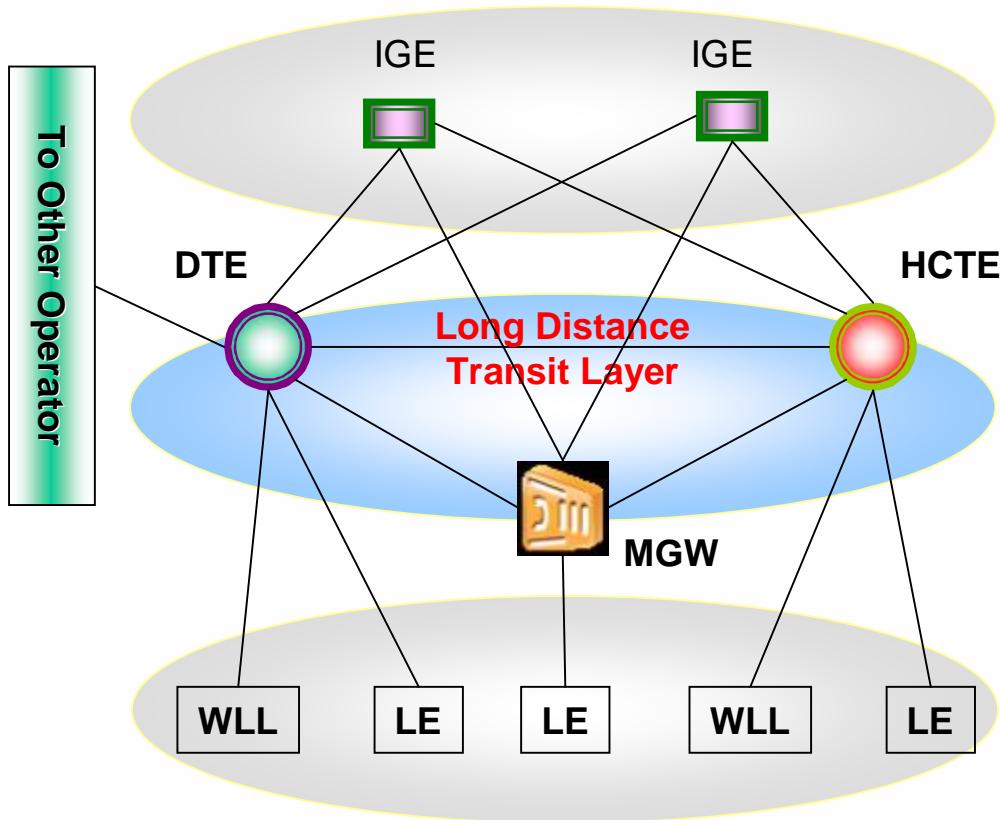
Note :

- *After POI migration, POI function will be removed from DTE.*

🔴 **Description**:

► There exist three kinds of transit exchanges in current PTCL network: DTE, HCTE and MGW.

► TDM and IP technologies coexist to transit long distance traffics.

► HCTE is pure TDM-based transit exchange

► MGW is pure IP-based transit exchange

► DTE is also TDM-based transit exchange, but some have subscriber access

🔴 **Target**:

► In the future, all long distance traffic transit will be based on MGW via IP network.

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LD Structure I   **LD Structure II**   **LD Structure III**
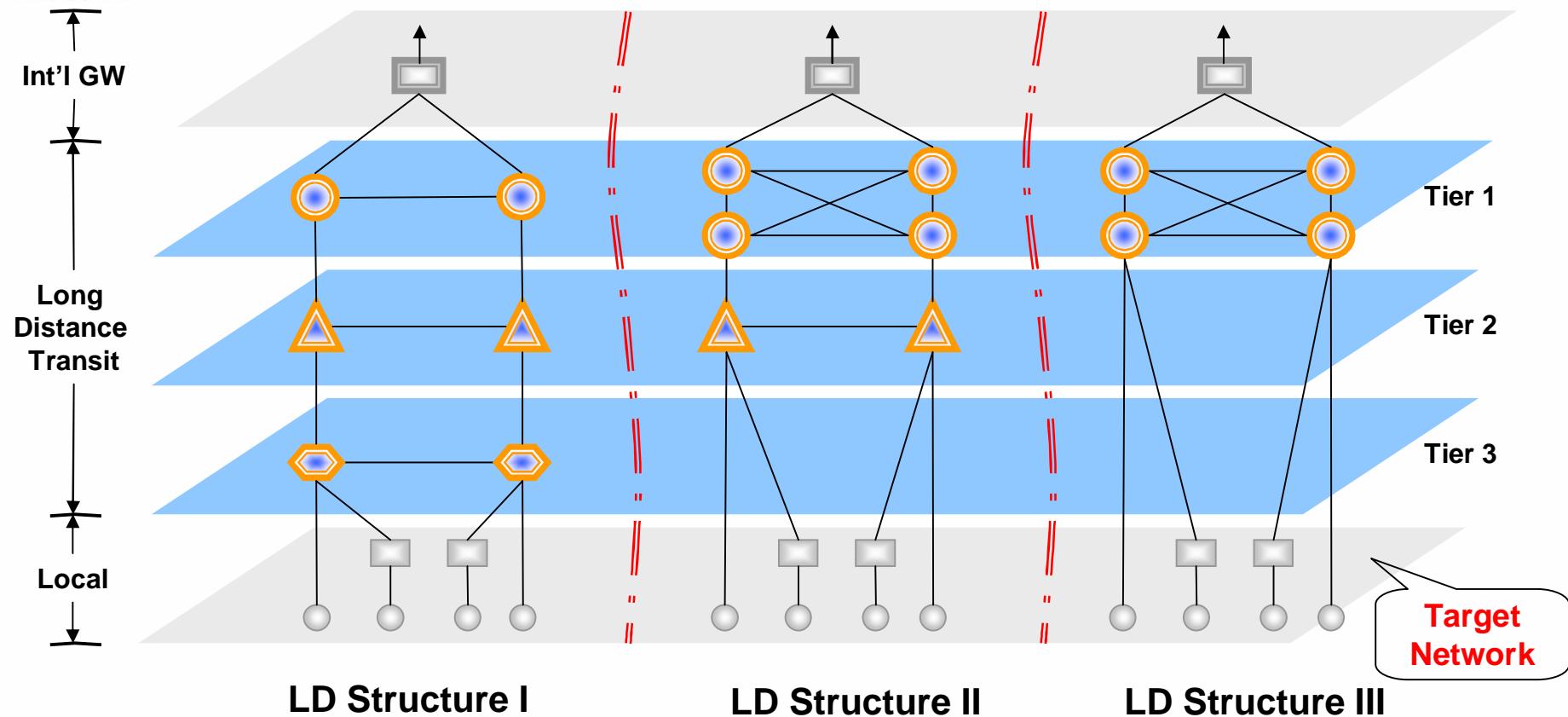
- ► In general, Tier 1 LD exchanges are used to transit national wide LD traffic; Tier 2 for intra-region LD traffic; Tier 3 for intra-district LD traffic.

- ► In current, LD transit network structure is evolving from structure I to structure II and III

- ► LD transit network structure planning depends on following factors: Exchange capability, Transmission CAPEX, Technological development……

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LD Tier 1

DC$_{1-1}$ DC$_{1-2}$
DC$_{1-N}$ DC$_{1-3}$

LD Tier 2

DC$_{2-1}$ DC$_{2-2}$
DC$_{2-N}$ DC$_{2-3}$

Long Distance

Local Network 1 **Local Network 2**

Tandem Tandem

LE LE LE LE LE LE

Local

► DC1 : Deploy in the center city of province to transit inter-province LD traffic

► DC2 : Deploy in the center city of local network to transit intra-province LD traffic

► One LD area code for each local network

► Local target Structure: Two Tiers (tandem & LE) or One tier
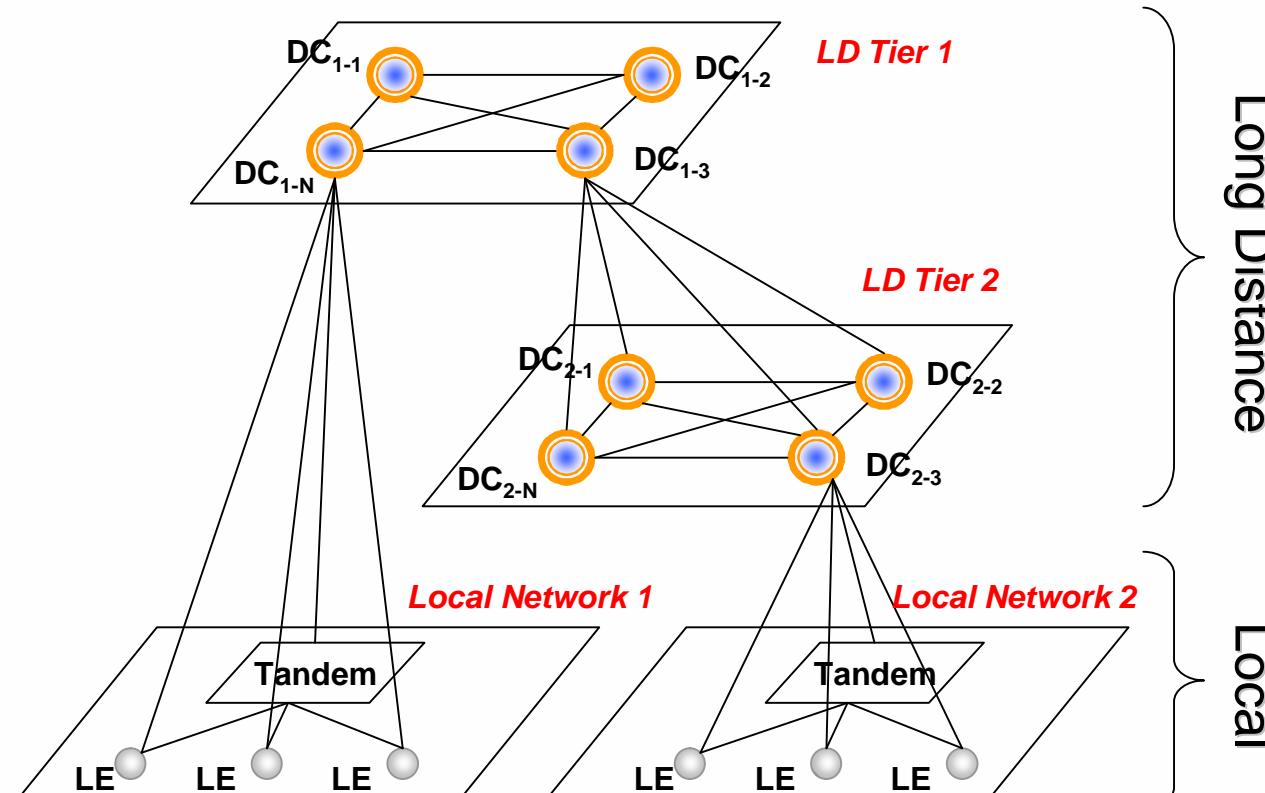
Note :

- *DC1 : Tier 1 long distance transit exchange.*
- *DC2 : Tier 2 long distance transit exchange.*
- *Tandem: Local tandem exchange*

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DC1 Tier

DC2 Tier

Local Network 1 Local Network 2

Tandem

LE LE LE

Tandem

LE LE LE

NGN LD
Transit

DC1 Tier

DC2 Tier

Local Network 1 Local Network 2

Tandem

LE LE LE

Tandem

LE LE LE
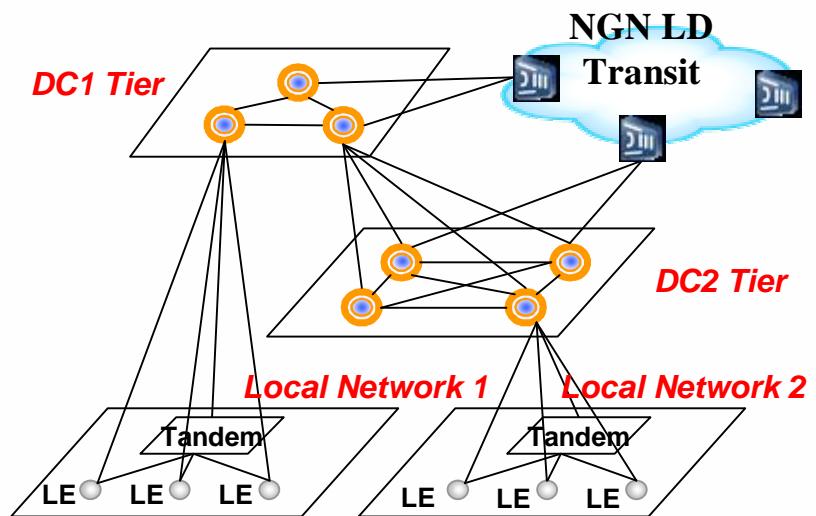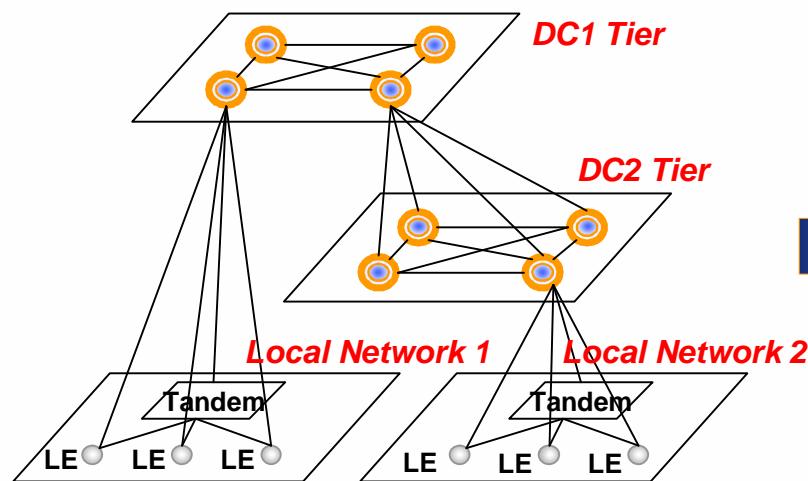
- Migration from PSTN to NGN

  ▶ Step 1 : Deploy NGN plane to replace part function of DC1

  ▶ Step 2 : Expand whole DC1 plane to NGN

  ▶ Step 3: Construct uniform NGN-based long distance transit plane after replacing TDM devices of DC2

NGN LD Transit

DC1 Tier

DC2 Tier

Local Network 1 Local Network 2

Tandem

LE LE LE

Tandem

LE LE LE

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SCP

Functional Server

Application Server

Strategy Server

SoftSwitch

SoftSwitch

IP Network

TG

SG

TG

SG

TG

SG

TG

Local Telecom Network

No.7 Signaling Network

Local Telecom Network
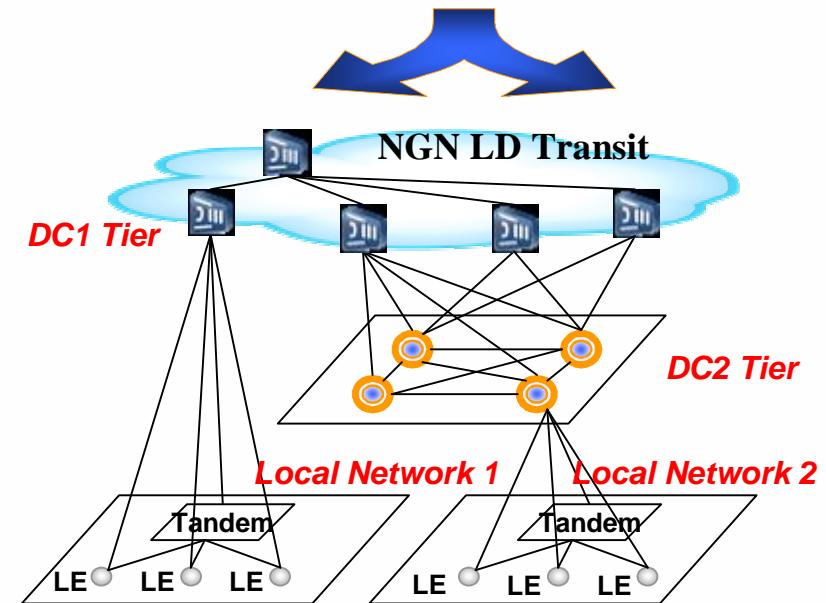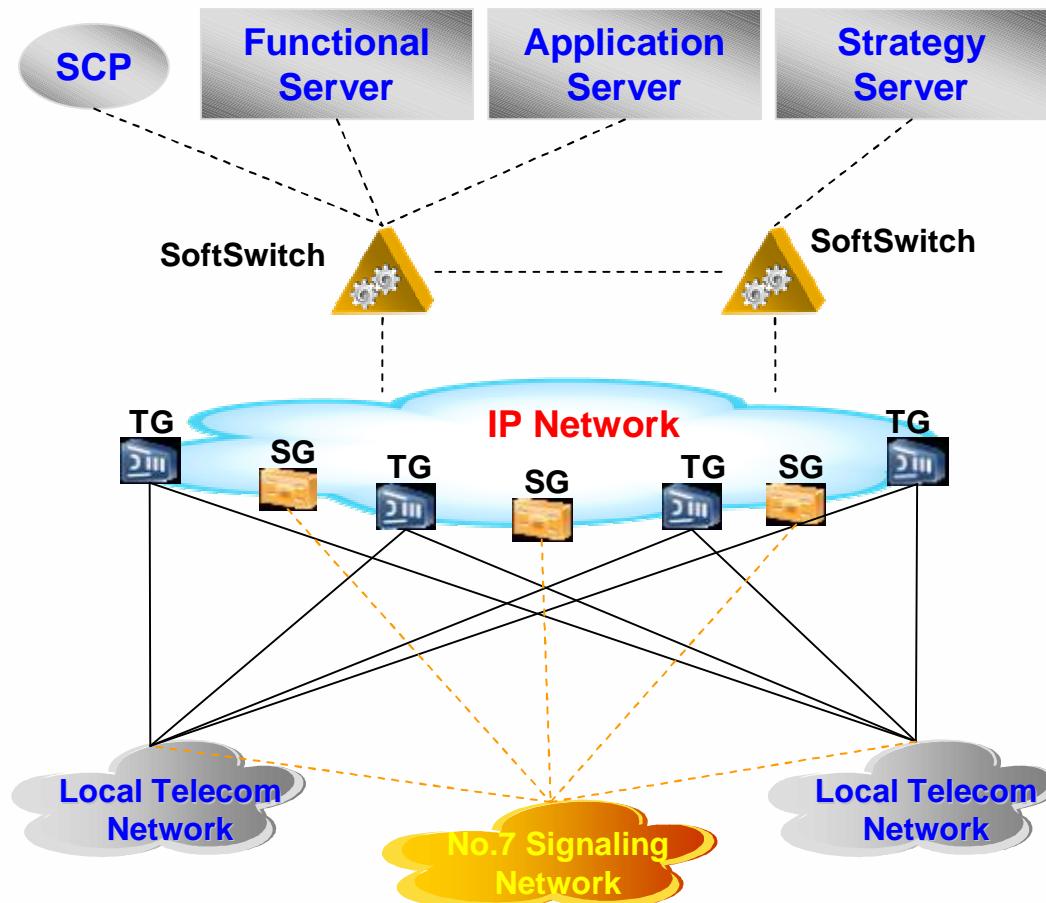
► Core Technology : IP

► Key Devices : NGN Series Devices, like Softswitch, MGW, SG etc.

► Main Advantage:

– Reduce network control point

– Flat network structure

– Suitable for video, data service

– ……

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CONTENT

- Current PTCL Transit Setting

- General Transit Network Structure

- PTCL Transit Deployment Suggestion

Inter-region LD Transit Tier (NGN)

R-tier

D-tier

Inter-District LD Transit Tier (DTE&HCTE)

Inter-District LD Transit Tier (DTE&HCTE)

Region C

District 4

District 3

District 1

District 2
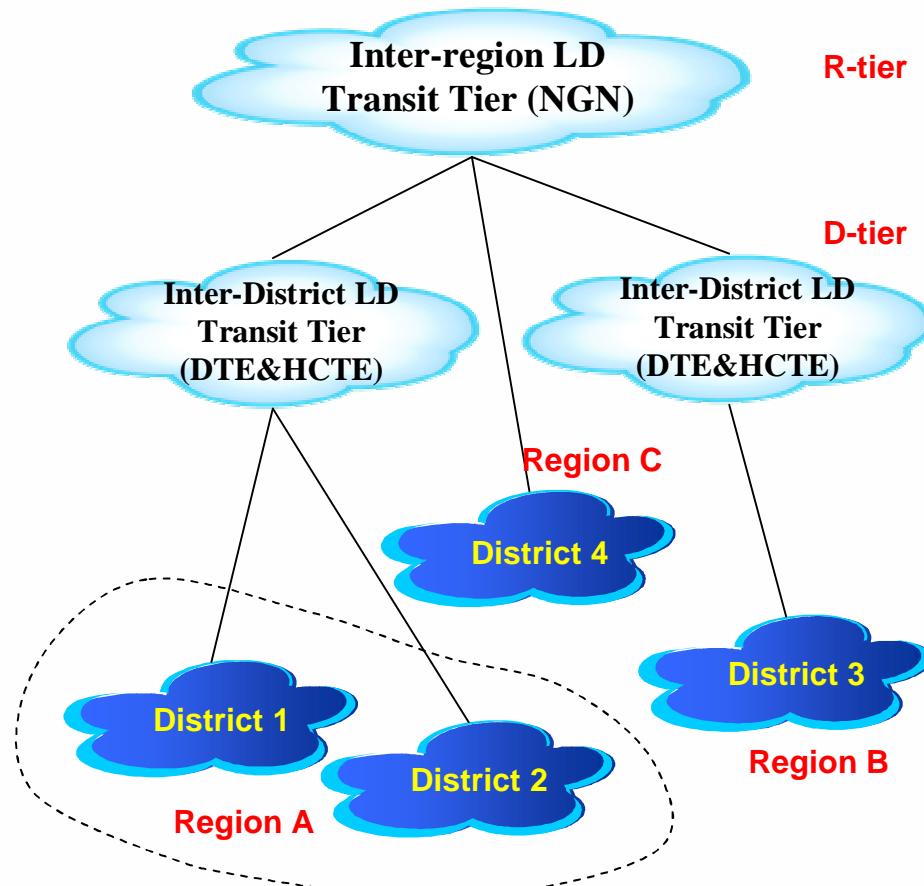
Region B

Region A

- 🔴 **"Dual tiers-Regional Partition" LD Transit Structure**:
  - **R-tier** : transit long distance traffic inter-region, implement with NGN devices
  - **D-tier** : transit long distance traffic inter-district of same region, implement with existing HCTE & DTEs

- 🔴 **Advantage**:
  - Consistent with general maintaining habits by regions

**LD Transit Target**: Flat single tier LD network structure based on NGN

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- *"Single tier-Two plane"* **LD transit structure**:

  – **Prior-plane** : Prior to attract long distance traffic under NGN plane, LD traffic proportion will increase from 0% to 100%

  – **Second-plane** : transit remaining LD traffic on TDM plane based on existing HCTEs & DTEs

- **Advantage**:

  – Consistent with NGN flat network structure

  – In the future, all transit plane will be IP-Based NGN with TDM network withdrawal.

Recommendation Solution

TDM LD Transit Plane

NGN LD Transit Plane

Z%   100%-Y%

Y%   100%-Z%

Local Telecom Network 1

X% 100%-X%

Local Telecom Network 3

District   District

Local Telecom Network 2

District
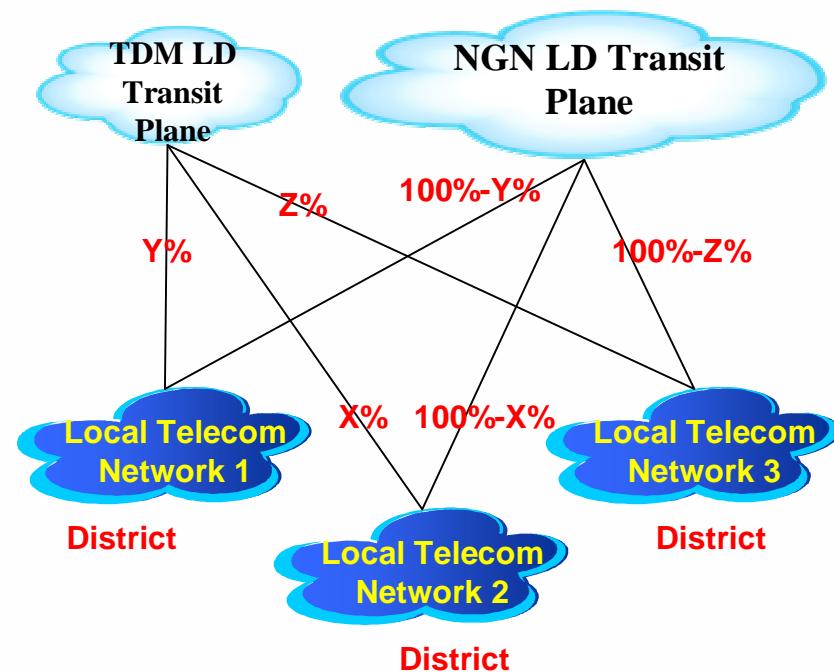
LD Transit Target: Single tier flat LD network structure based on NGN

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Thank You

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