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Central Controlled IPRAN
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Introduction

- IP RAN (Radio Access Network) is a run solution using IP technology to provide network services between UE devices and mobile core network.

- IP RAN has been widely used to provide varies access modes with high scalability and flexibility, it reduced network construction cost and protects codes of investments.

- However the existing IP RAN implementation needs to be improved due to
  - ➢ Manual configuration Point-by-Point
  - ➢ Complex network construct and service deployment
  - ➢ Low troubleshooting efficiency

- Central Controlled IP RAN (SDN enabled) can further improve the IP RAN and resolve these problems

Central Controlled IP RAN Use Case

## Applied in China Telecom's Access and Aggregation Network
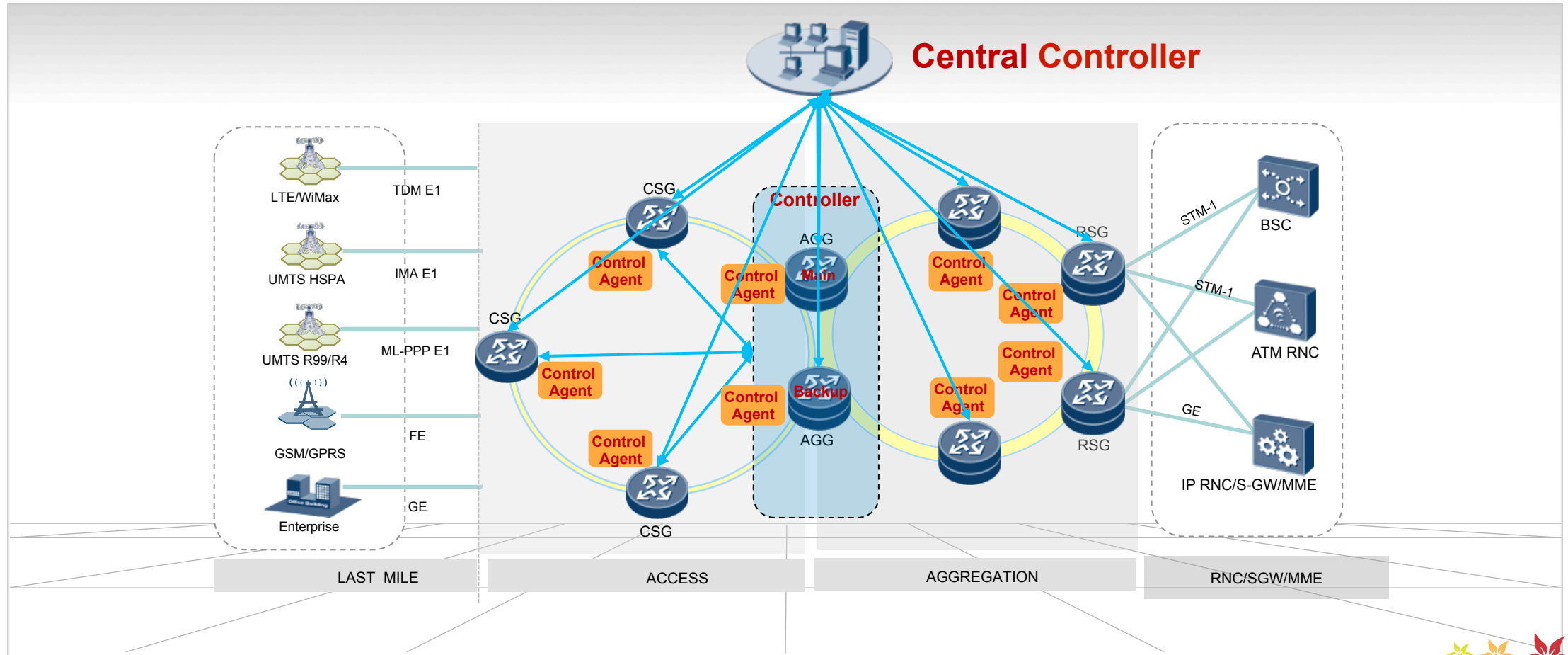
CC IP RAN Network Architecture
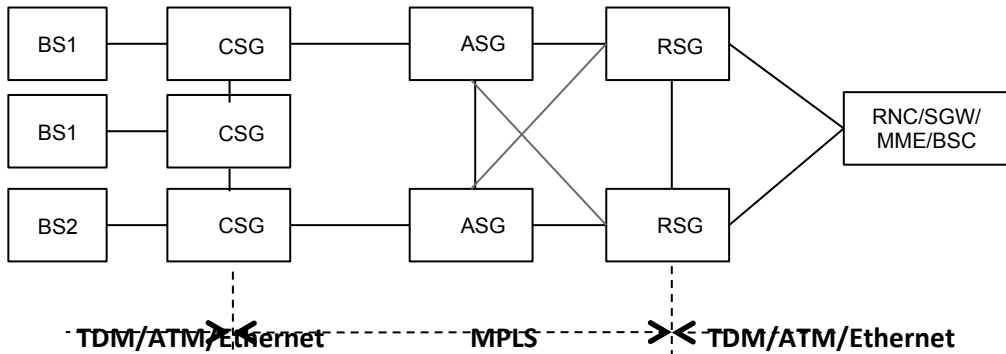
- ASG: Aggregation Service Gateway
- BS: Base Station
- CSG: Cell Site Gateway
- RSG: Radio Service Gateway

Conversional IP RAN Network

- Major Control functions are moved to controller from network devices
- Controller has E2E control capability
- Access, Aggregation and RSG are forwarding devices.
- Programmability of controller
- Open to third party applications
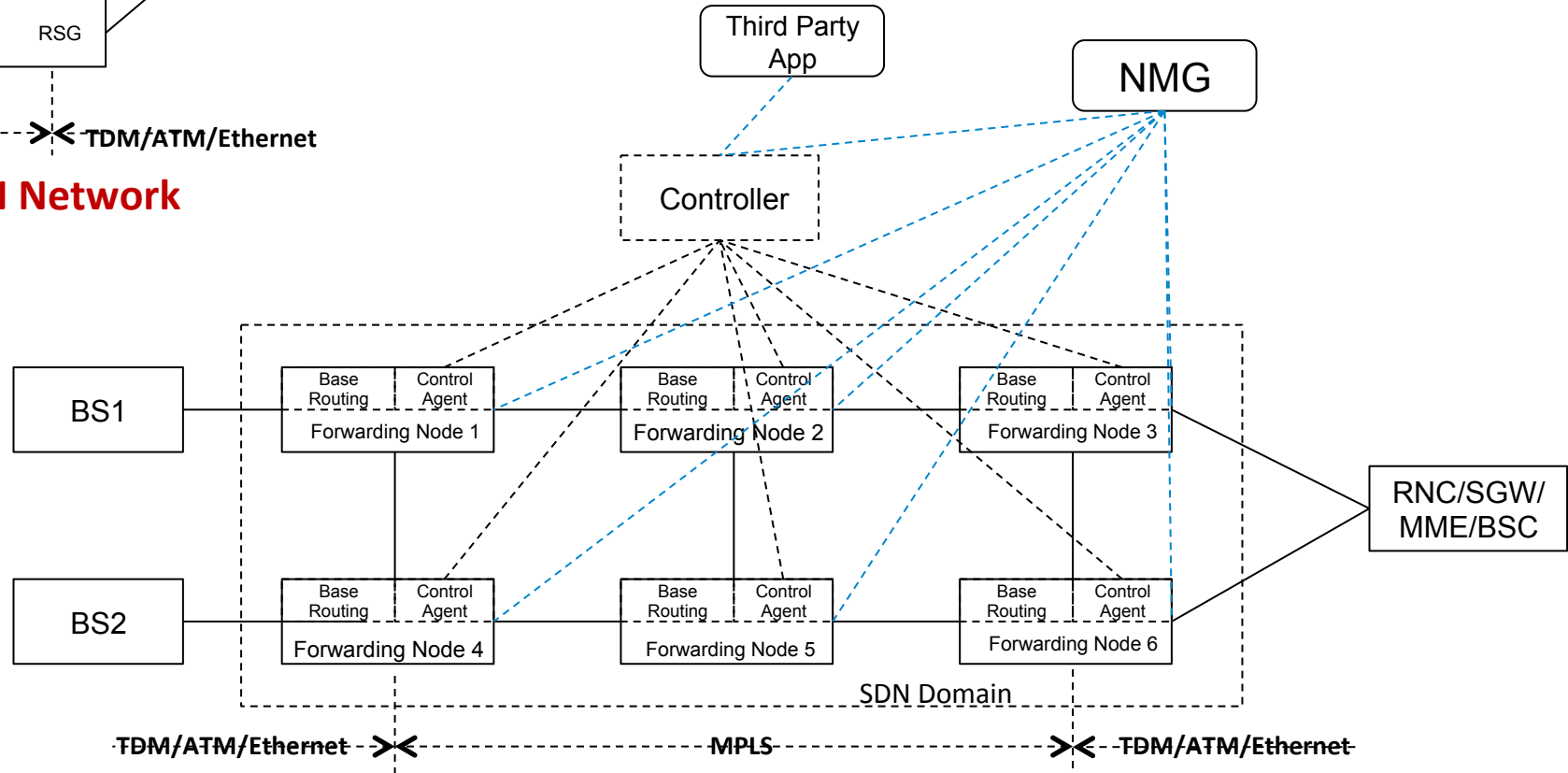
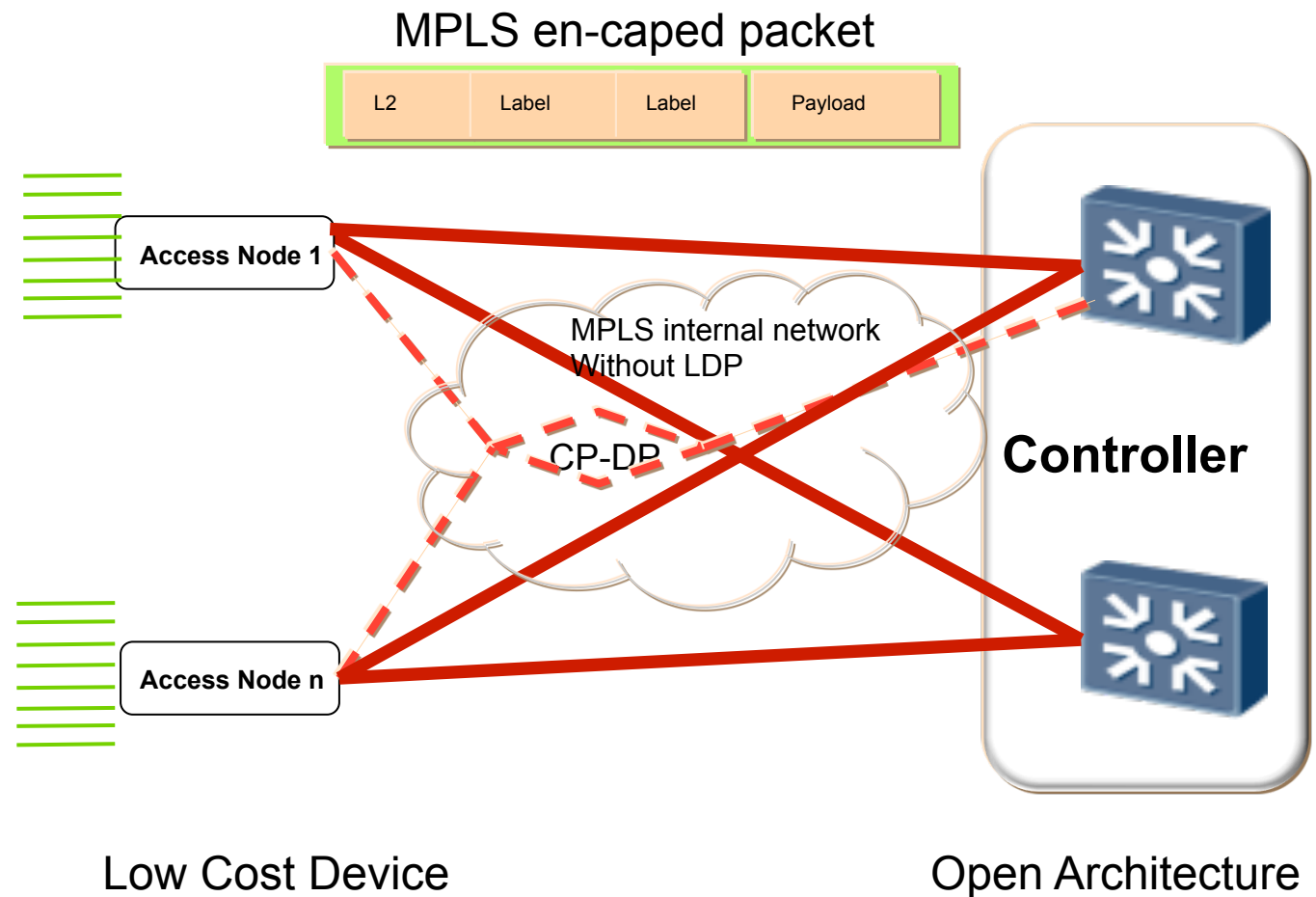**Central Controlled IP RAN Network**

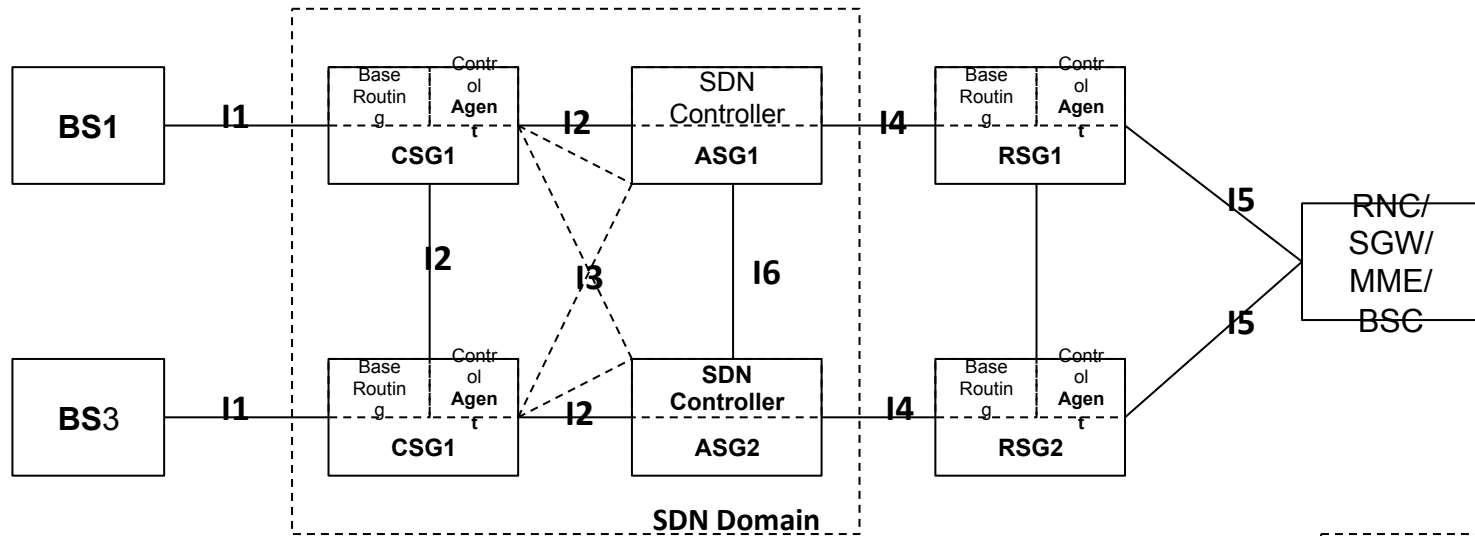# System Architecture

- **Functions of Controller**
  - CP-DP control protocol features
  - Network resource management features
  - Network virtualization features
  - Network protocol layer, IGP,LDP/RSVP
  - Network service layer,L2 (VPWS/VPLS) VPN, L3 VPN
  - Fault, Alarm, NB-API

- **Functions of Forwarding Node**
  - IP/ MPLS forwarding
  - CP-DP protocol features
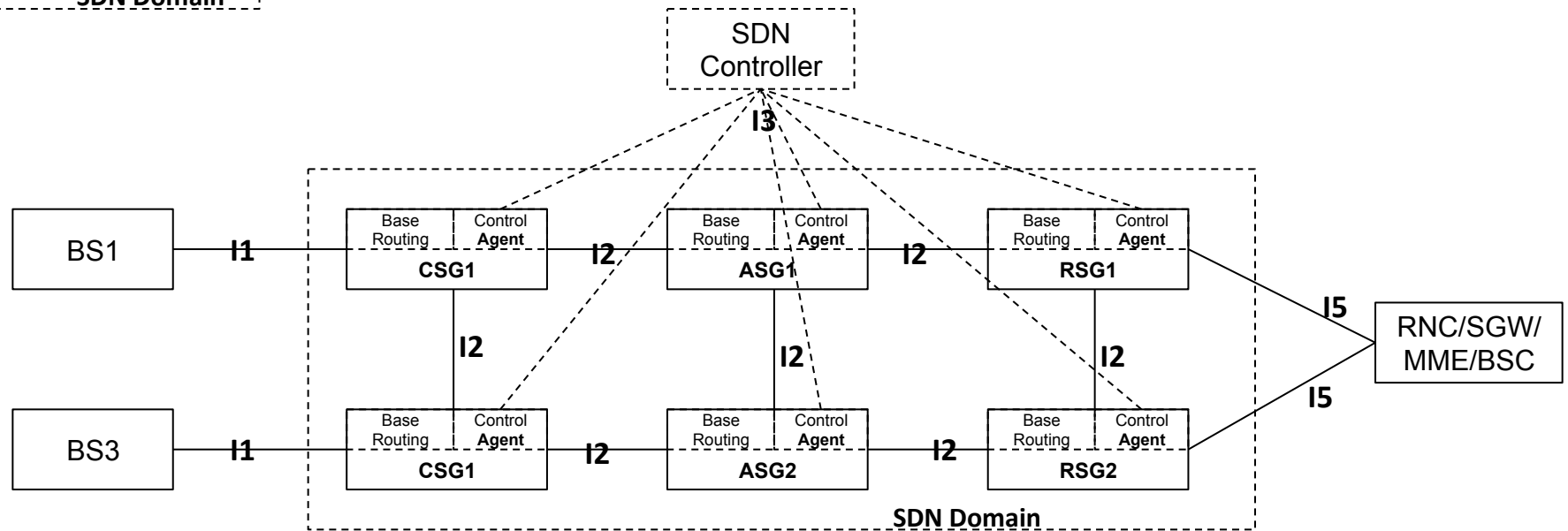 - Control Agent
  - Light IGP for connectivity

MPLS en-caped packet
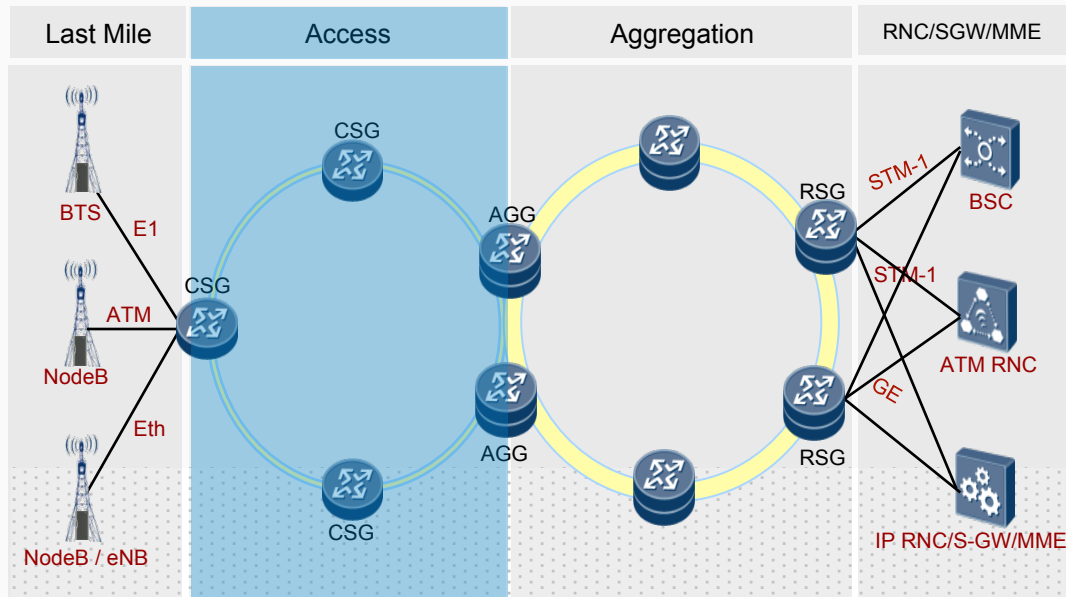
L2	Label	Label	Payload

Access Node 1

MPLS internal network
Without LDP

CP-DP

Controller

Access Node n

Low Cost Device

Open Architecture

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Controller Deployment Options

Built-in Mode:
Controller on Device

Stand-along Mode:
Controller on Server
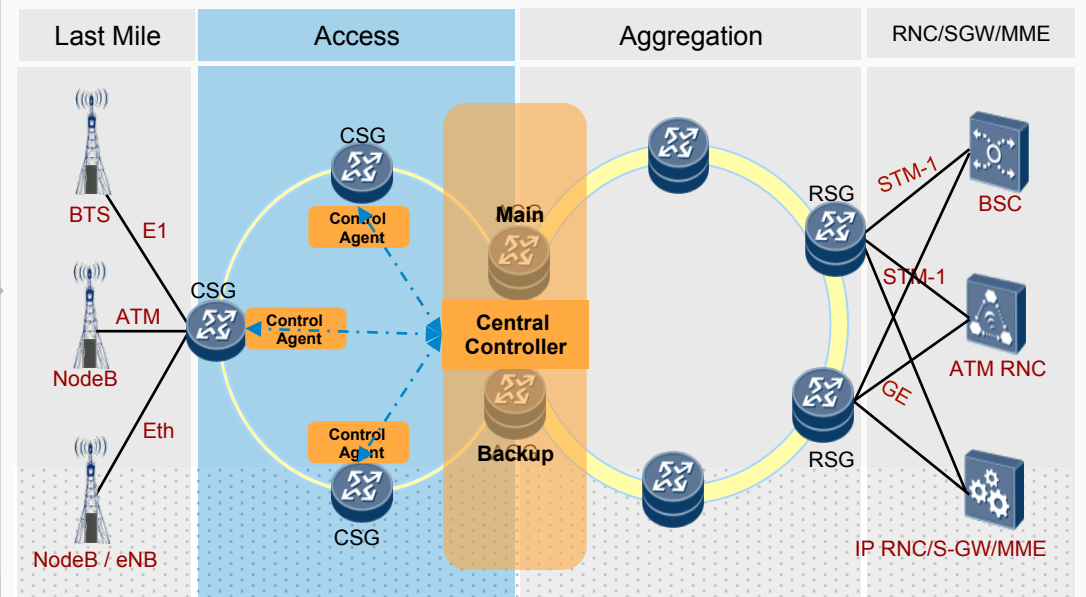
Central Controlled IP RAN Overview

Mobile Backhaul

| Last Mile | Access | Aggregation | RNC/SGW/MME |

BTS, E1, NodeB, ATM, Eth, NodeB / eNB, CSG, AGG, RSG, STM-1, BSC, STM-1, ATM RNC, GE, IP RNC/S-GW/MME

Manual configuration point-by-point

Central Controlled IP RAN

| Last Mile | Access | Aggregation | RNC/SGW/MME |

BTS, E1, NodeB, ATM, Eth, NodeB / eNB, CSG, Control Agent, Main, Central Controller, Backup, RSG, STM-1, BSC, STM-1, ATM RNC, GE, IP RNC/S-GW/MME
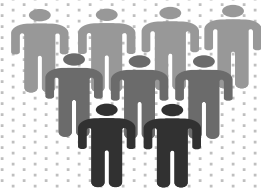
■**Simple O&M**

➢Free Service Planning, Plug and Play

➢Automatic protocols deployment and fast services launch

➢Fast trouble shooting

Free Service Planning, Plug and Play
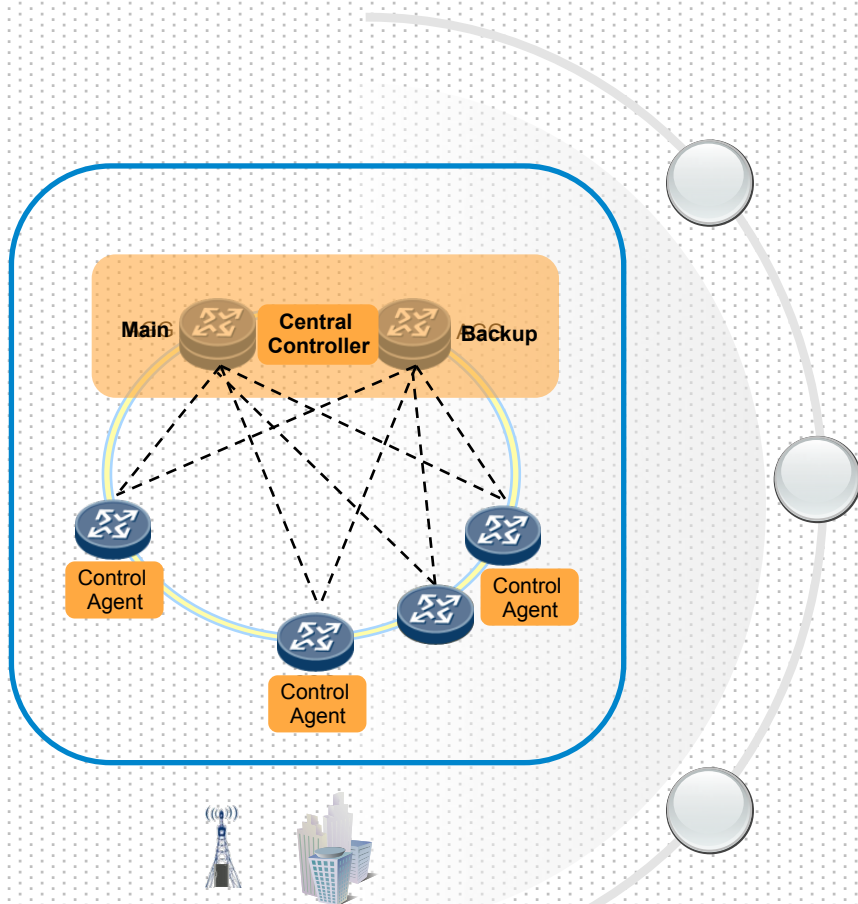
Mobile Backhaul: Complex services planning

| Planning IP Address | Dividing IGP Area | Planning CSG&AGG ring relations |

SDN-based Mobile Backhaul: Free Services Planning

| Planning IP Address | Dividing IGP Area | Planning CSG&AGG ring relations |

Saving

Plug and Play, Zero Touch for Basic Network

Protocol \ Solution	Current IP RAN Access Solution	Central Controlled IP RAN
IGP	Yes	Automatic deployment
RSVP-TE	Yes	No

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Automatic Protocols Deployment and Fast Services Launch

Mobile Backhaul
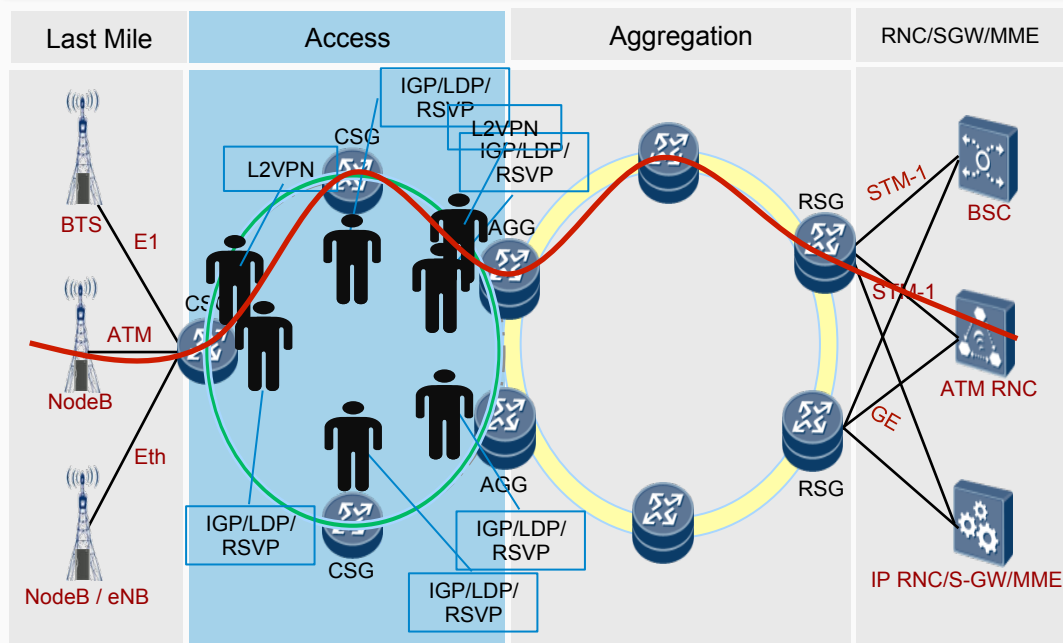
Protocol-based point-by-point services launch

Simple protocol
Automatic configuration

Lowers skill
requirements of staff

Central Controlled IP RAN
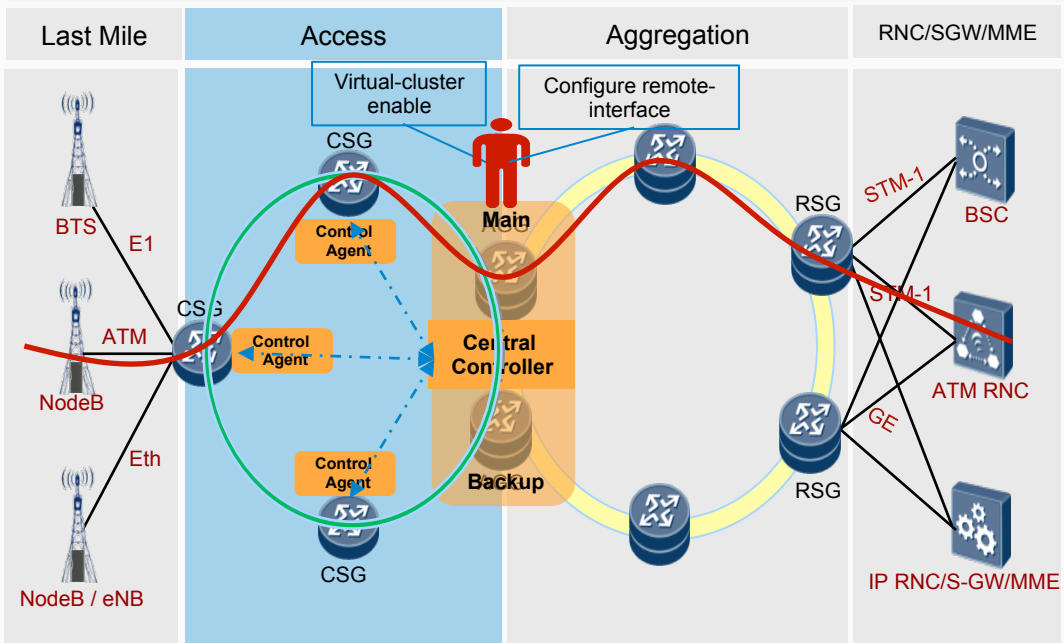
Service-based end-to-end services launch

Improves efficiency of
services launch

Fast Trouble shooting

Thank you

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