

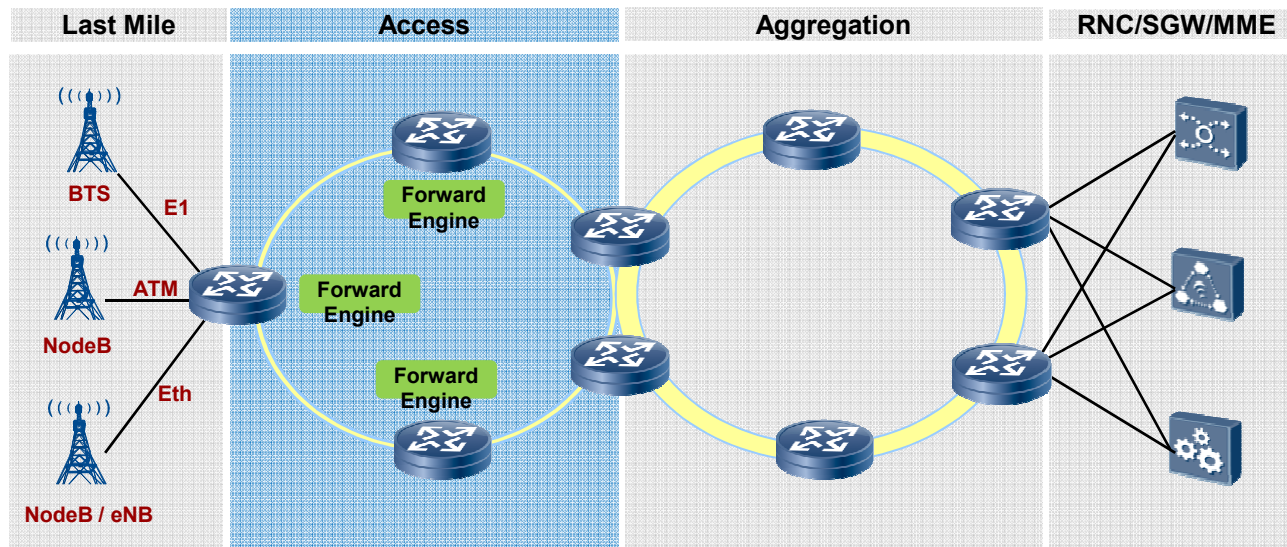
# Problem Statements of Scalable Synchronization Networks

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Liuyan Han, Yuanlong Jiang  
Xian Liu, Jinchun Xu

# Backgrounds

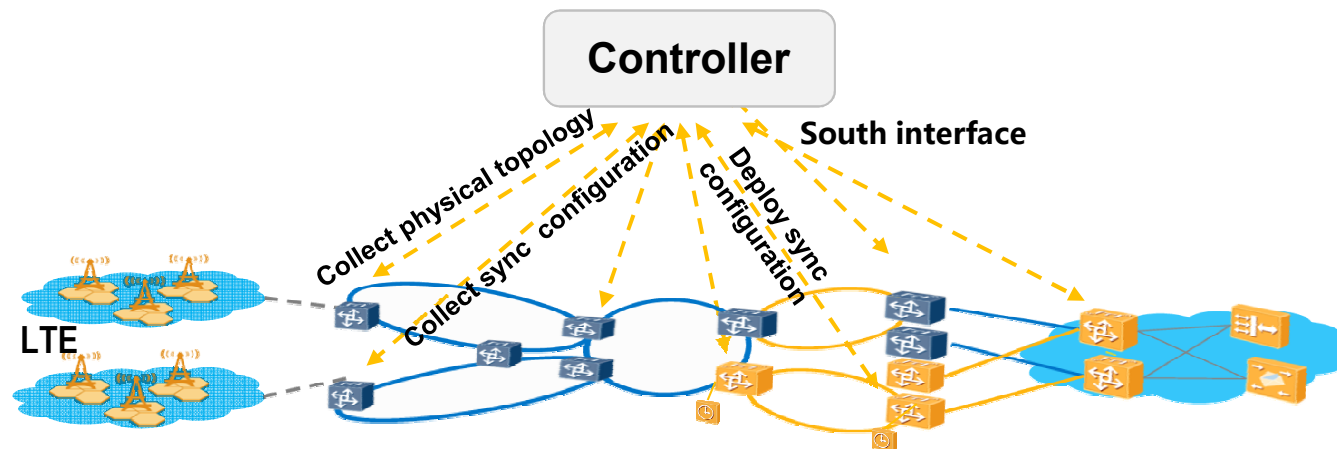
- Packet networks are becoming mainstream mobile backhaul infrastructure, it is important to transmit and distribute high precision timing for the operation of mobile services;
- IEEE 1588v2 and SyncE are widely deployed for time and frequency synchronization respectively in mobile network;
- With the deployment of 4G network, both size of a mobile network and the size of its backhaul network have increased greatly.



# Use cases for scalable synchronization networks

## ■ Synchronization configuration

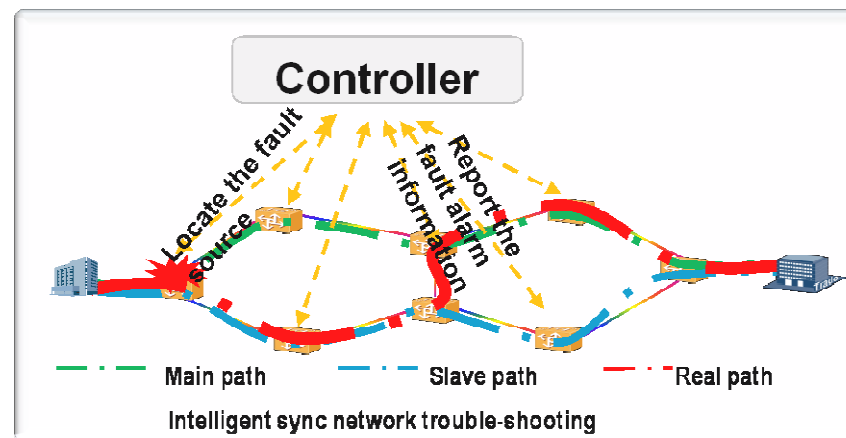
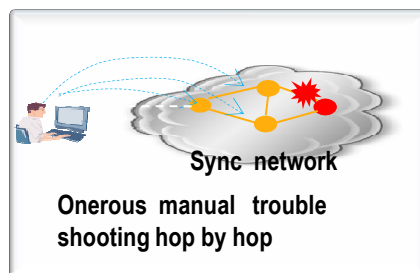
- Manual provisioning and configuration of a large scale network to set up synchronization distribution with complex parameters are onerous and error-prone;
- A central controller, which automatically compute and provision a synchronization network, can accelerate the synchronization configuration and thus fast deployment for a backhaul network;
- A common interface is required to accommodate different types of equipments.



# Use cases for scalable synchronization networks

## ■ Synchronization OAM

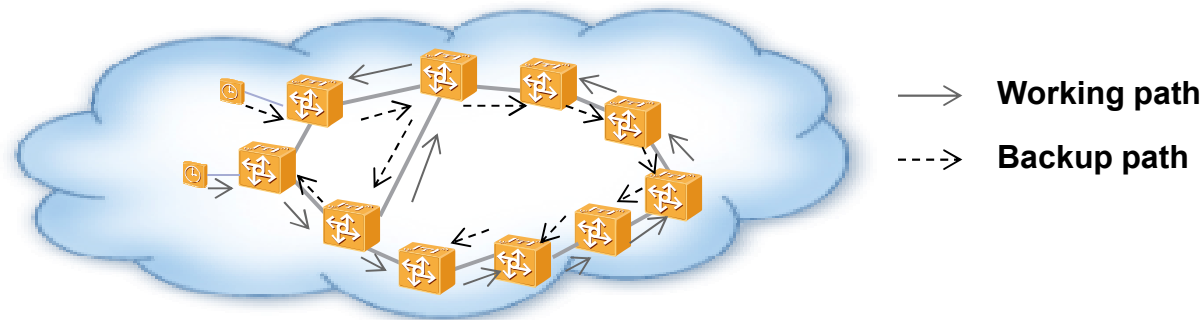
- Traditional synchronization network maintenance is mainly resorted to hop by hop manual trouble shooting, which is much more complex, time-consuming and inefficient in a large network;
- flexible OAM tools for synchronization, such as troubleshooting and performance monitoring, are needed if the timing source is lost, unstable or accuracy is not met.



# Use cases for scalable synchronization networks

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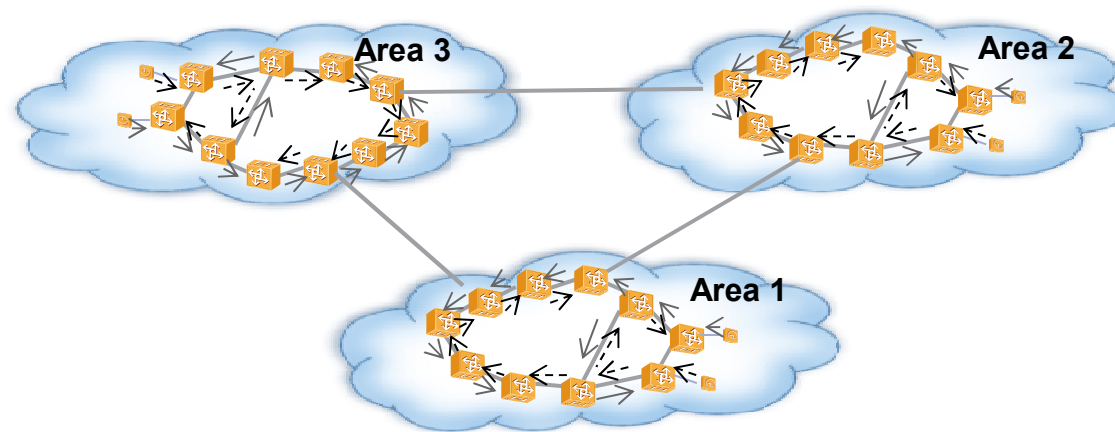
- Synchronization network protection and recovery
  - Faults or degradation in a synchronization network can seriously affect the services provided in the mobile side;
  - A device is required to switch to an backup path automatically when the working paths fails, and may restore to the working path when it recovers;
  - Backup path generation is more complicated in a large synchronization networks as it may inadvertently introduce synchronization loops.



# Use cases for scalable synchronization networks

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- Multi-layer/Multi-area synchronization network
  - In a large scale synchronization network, end devices can hardly satisfy its hop restriction to the timing source;
  - A huge synchronization network is required to be hierarchically divided into multi-layers and/or multi-areas;
  - The interaction between synchronization areas should be taken into consideration.



# *Discussions*

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- Is there any interest in solving these problems in the WG?
- Can we take up the scalable sync network into the new TICTOC WG charter?
- Or do we need a new BoF?

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*Thank You*