

Frame Structure for multi-hop relay and Postamble for relay link

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Purpose:

The purpose of this slide is to support proposed frame structure for multi-hop relay and postamble for relay link.

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**Frame structure for multi-hop relay and
postamble for relay link:
#07/135, #07/136**

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Outline

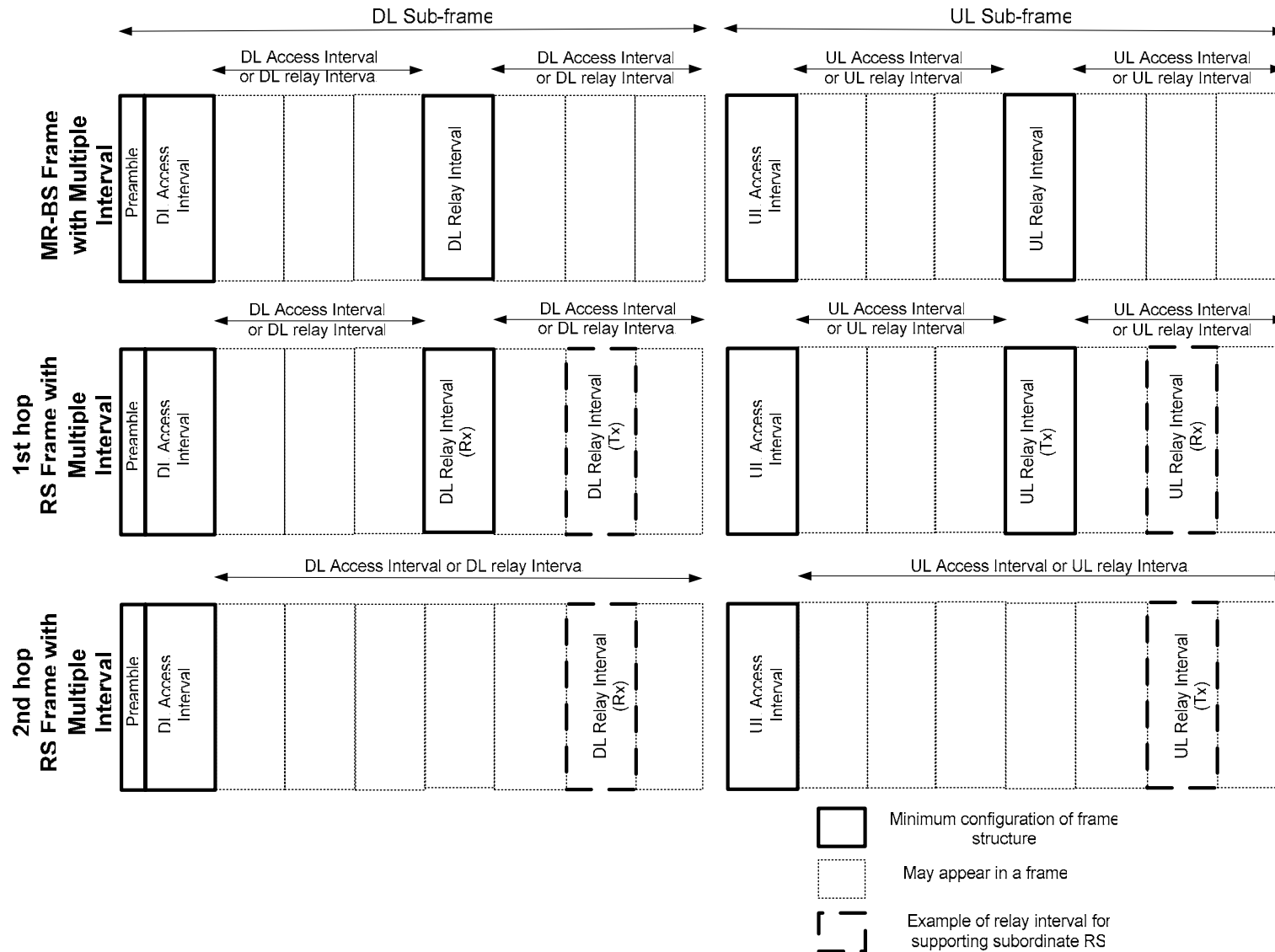
- Frame Structure for Multi-hop relay
- Postamble for the relay link
- Summary

**Frame structure for
multi-hop relay
#07/135**

Frame structure for multi-hop relay

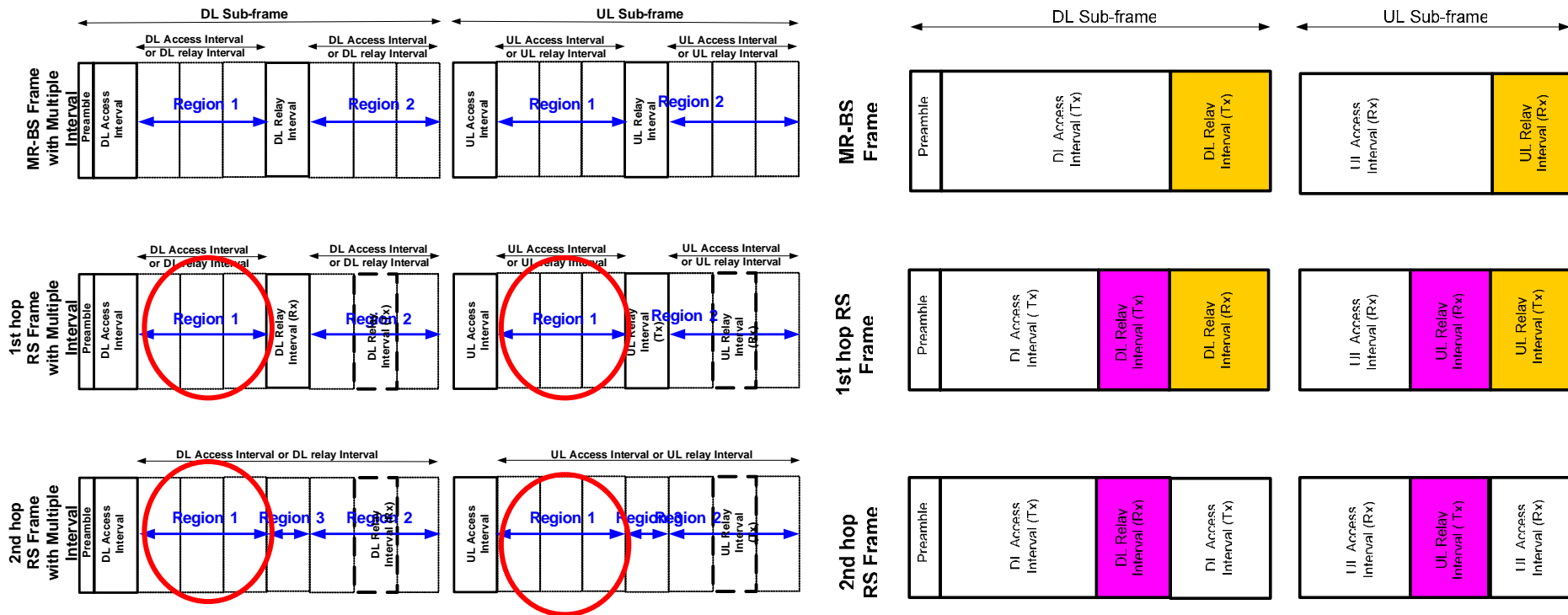
- Generalized frame structure
 - Exactly follows the text that is agreed in the November meeting
 - With signaling and scheduling, configuration of some example frame structures can be derived
- Minimum configuration of frame structure
 - Aligned with Figure 218 (802.16e) in the level of detail
 - Same level of frame structure is provided
- Term change
 - Access/Relay **zone** => Access/Relay **interval**
 - To avoid confusion with existing term in 802.16e
- In the generalized frame structure,
 - The first access interval shall include preamble, FCH, DL(UL)-MAP
 - The additional access interval shall not include preamble,FCH,DL(UL)-MAP

Generalized Frame Structure (GFS)



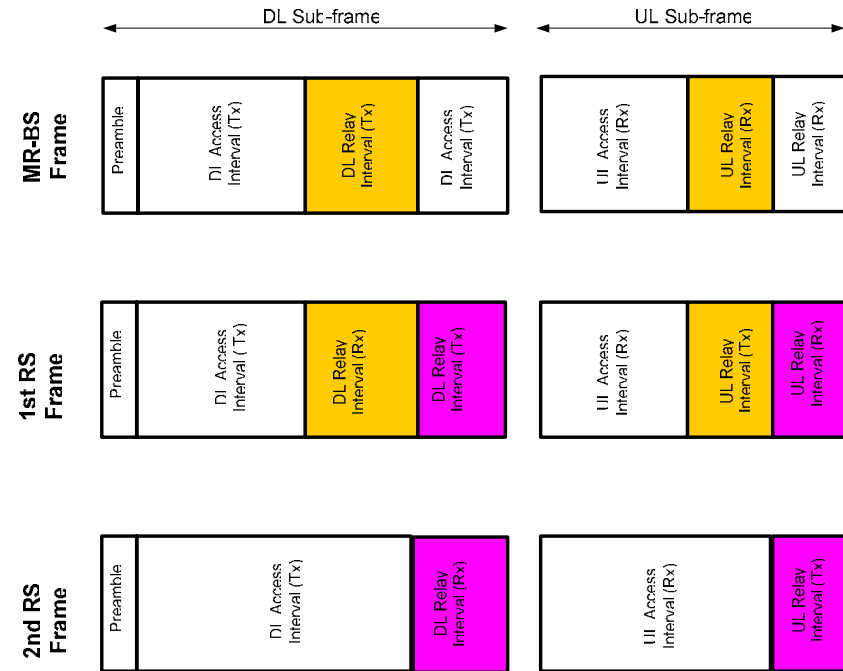
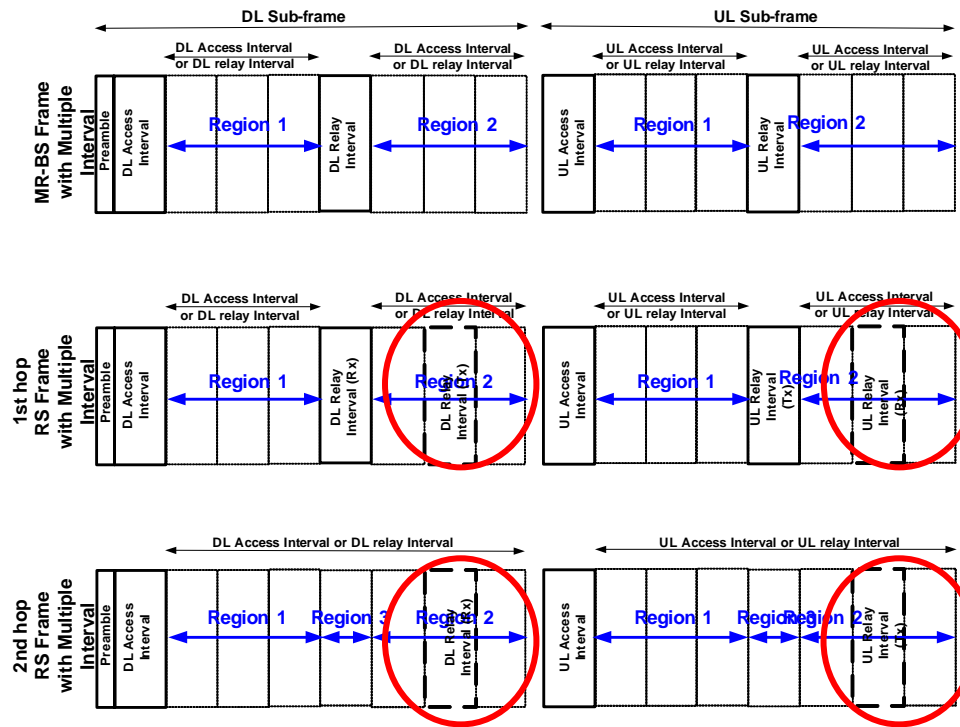
With signaling and scheduling, GFS can support various configurations

Configuration #1 from GFS



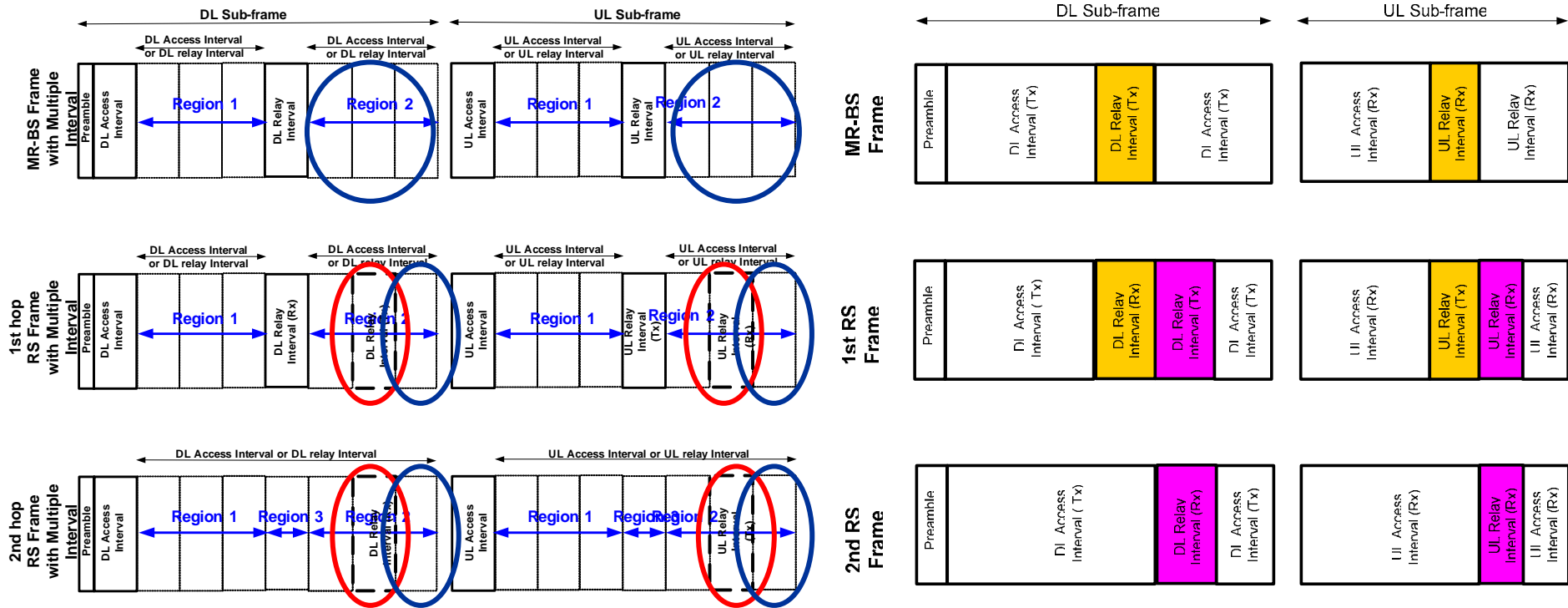
- 1st hop RS enables region 1 for relay interval
- 2nd hop RS enables region 1 for relay interval

Configuration #2 from GFS



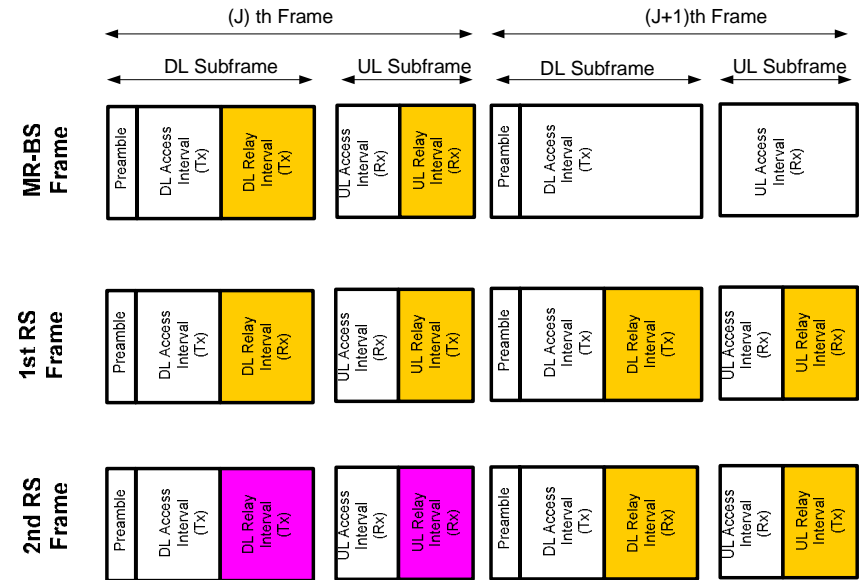
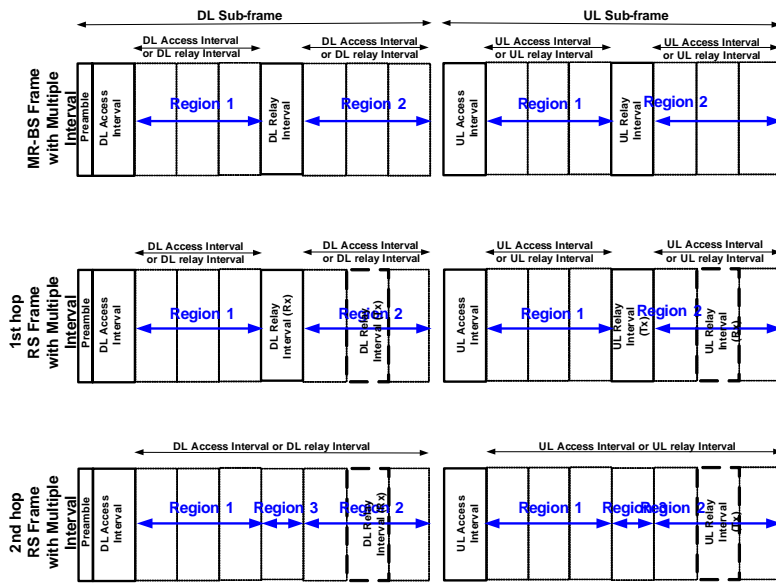
- 1st hop RS enables region 2 for relay interval
- 2nd hop RS enables region 2 for relay interval

Configuration #3 from GFS



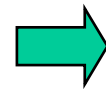
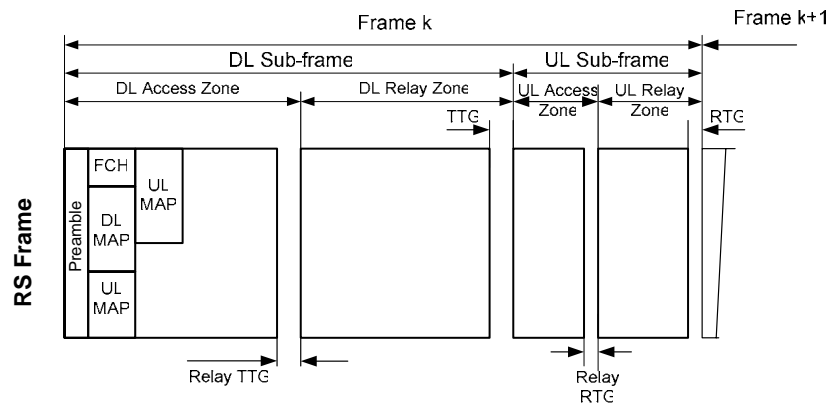
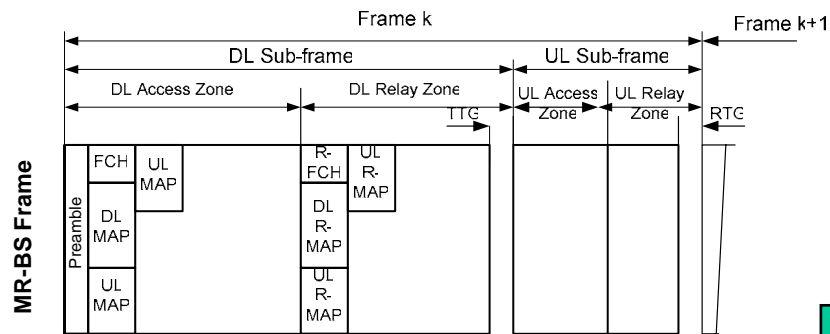
- 1st hop RS enables region 2 for relay interval and access interval
- 2nd hop RS enables region 2 for relay interval and access interval

Configuration #4 of GFS

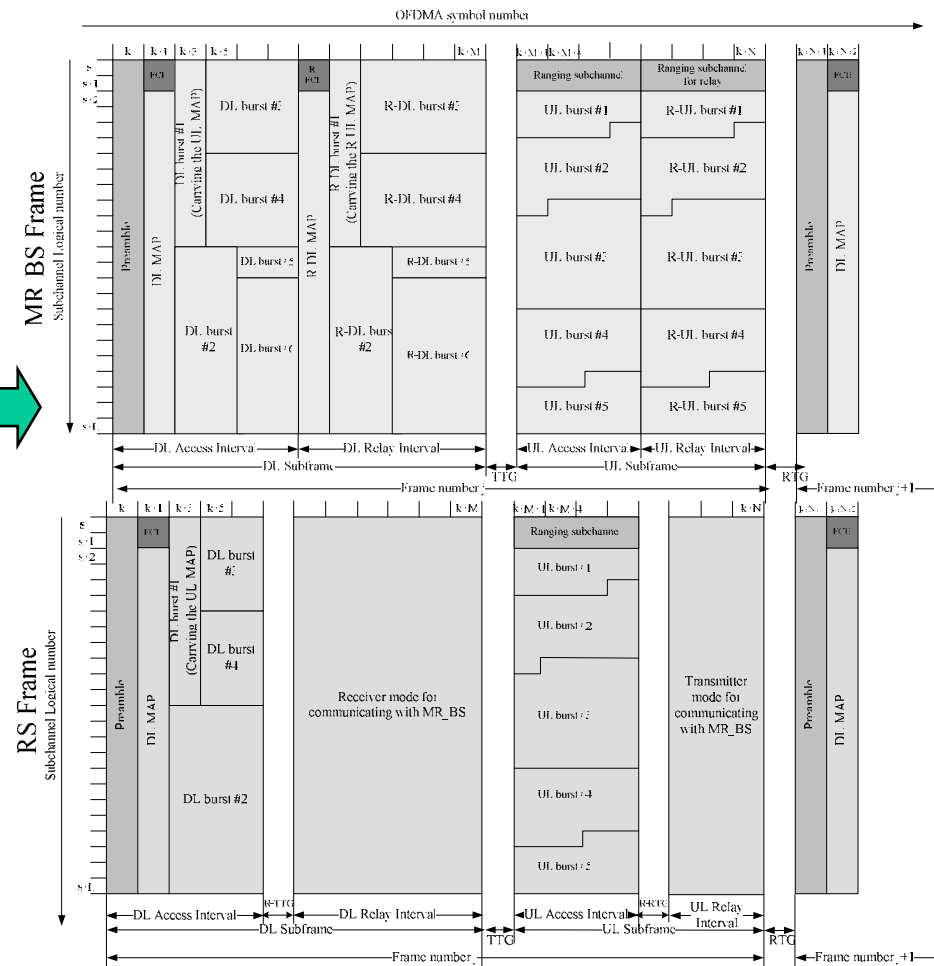


Minimum Configuration of the inband frame structure

**-Previous-
(High level)**



**-Proposed-
(Same level as Figure 218 in 802.16e)**



**Postamble for the
relay link
#07/136**

Amble for the relay link

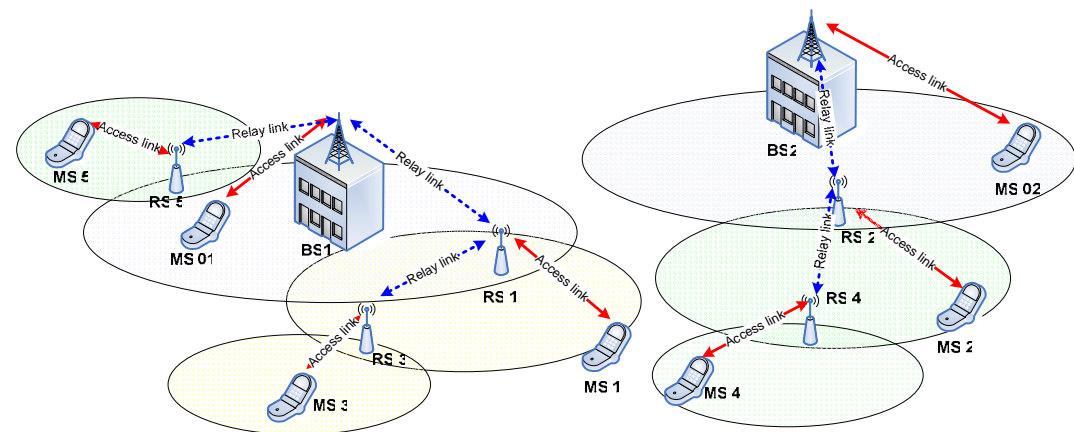
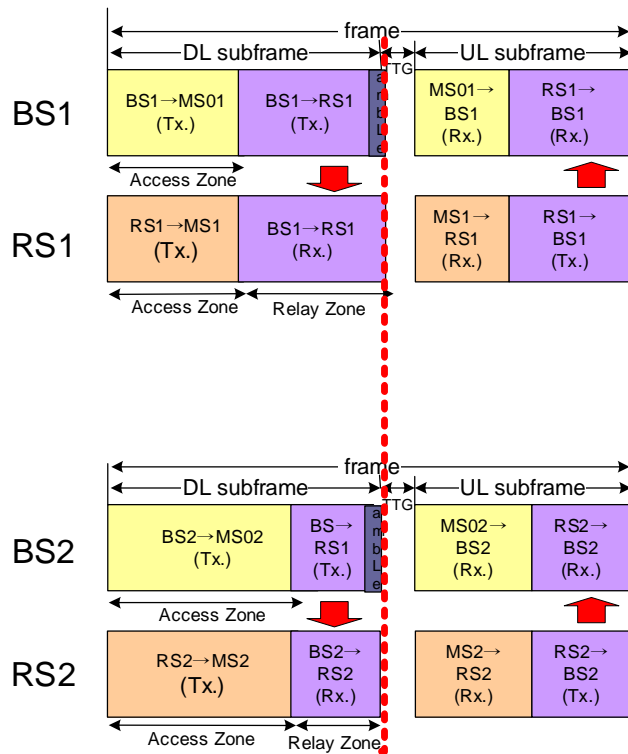
- Time Aligned amble location

- Synchronization for the relay link
- Neighbor scanning

- Flexible relay zone

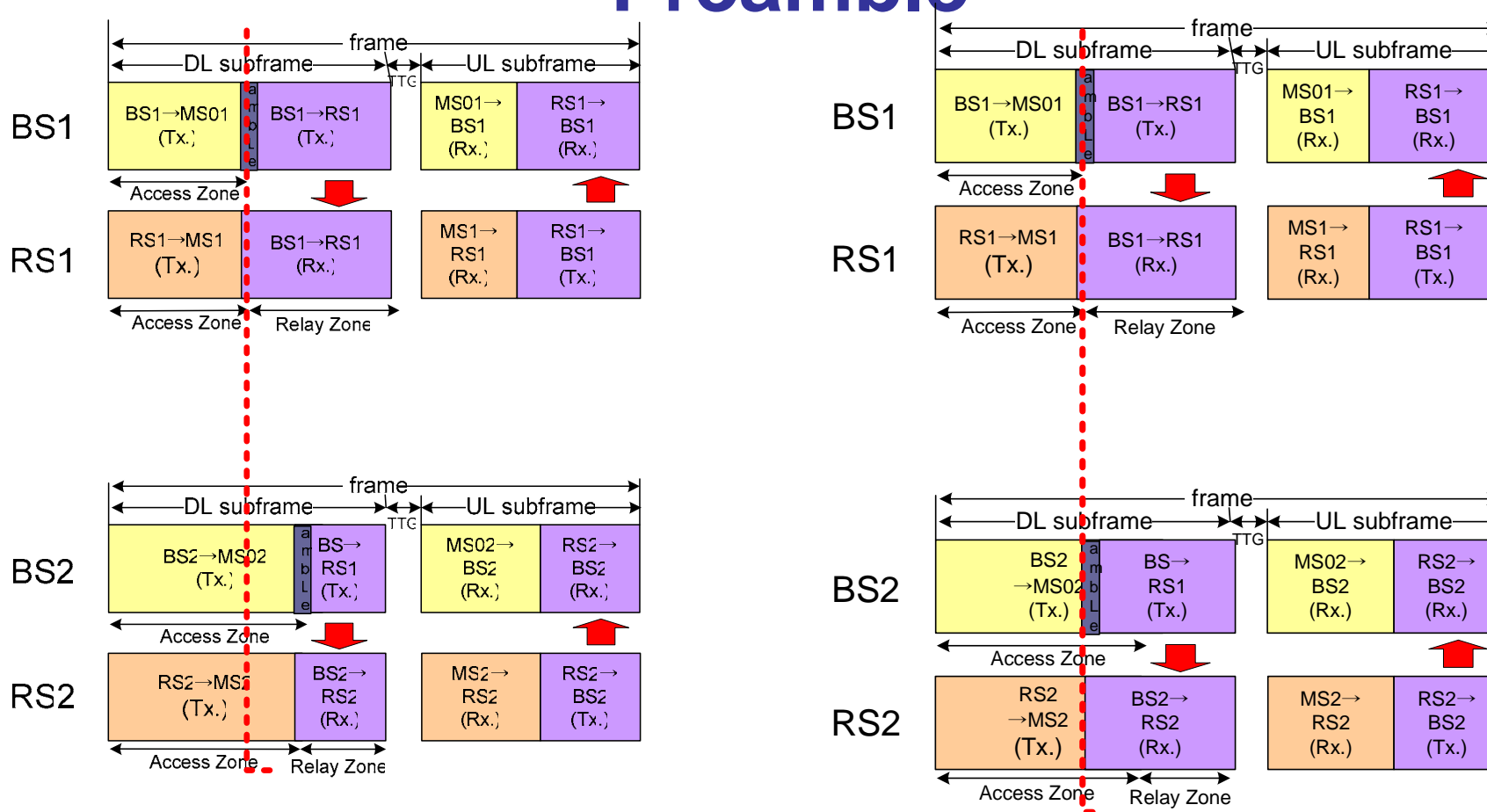
- To support Load balancing (access zone/relay zone)
- Postamble can support flexible access/relay zone

Amble location for the relay link -Postamble-



Both flexibility and time alignment can be satisfied

Amble location for the relay link -Preamble-

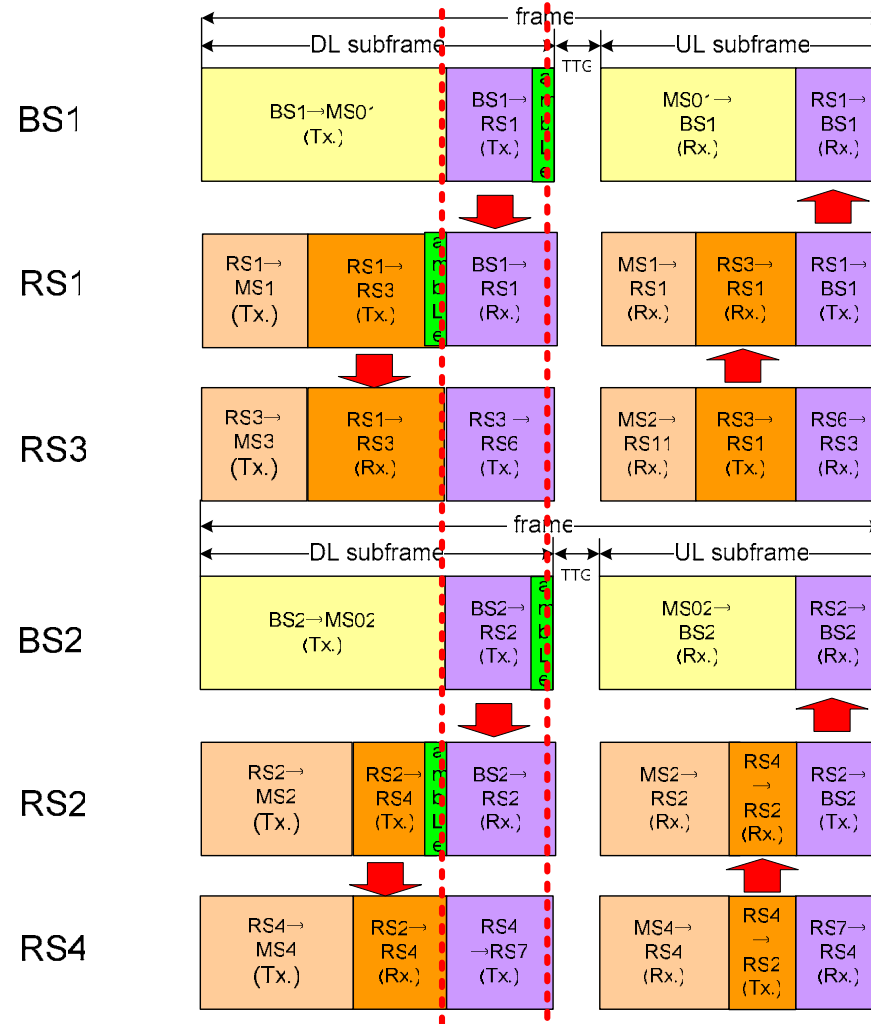


-flexibility is satisfied
However, time alignment is **not** satisfied-

-time alignment is satisfied
However, flexibility is **not** satisfied-

Both flexibility and time alignment can **not** be satisfied **simultaneously**

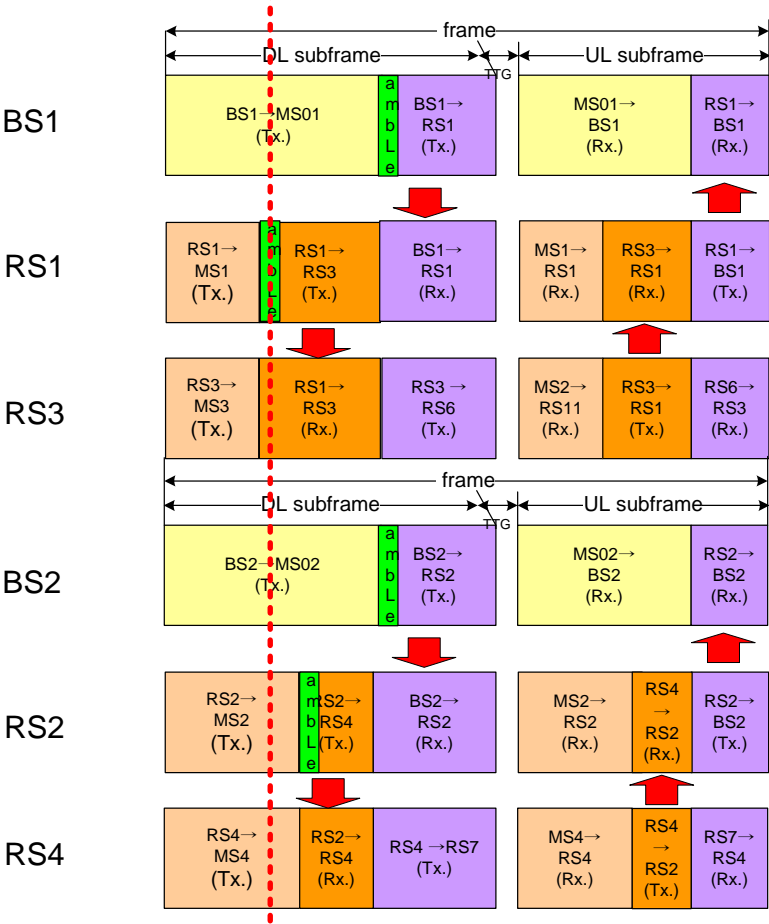
Amble location for the relay link -Postamble-



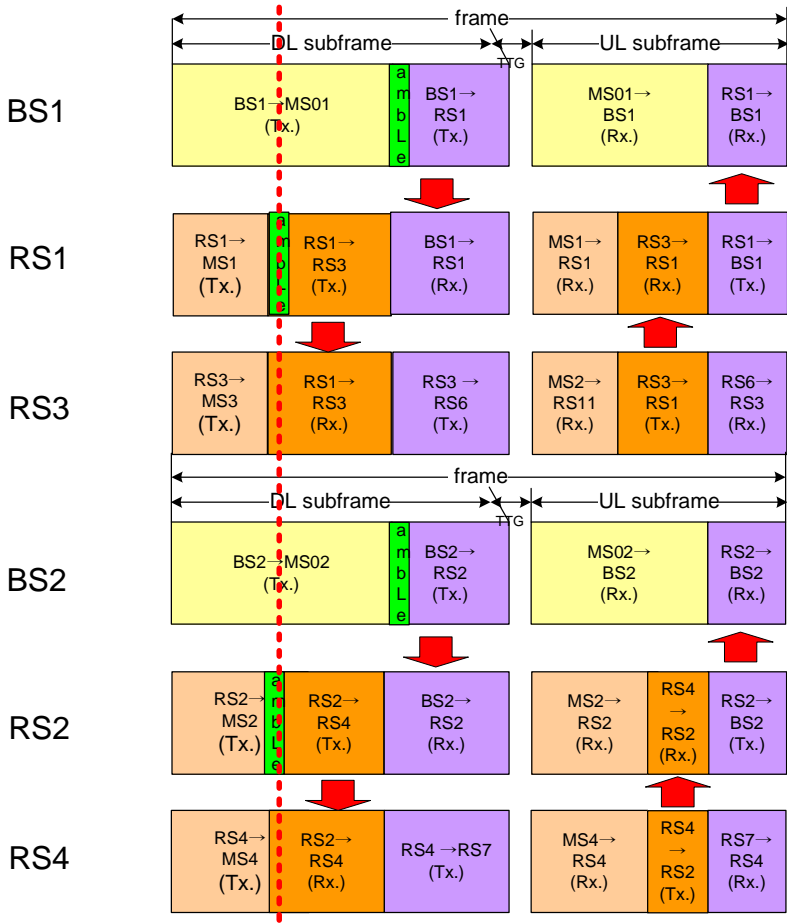
Both flexibility and time alignment can be satisfied simultaneously

Amble location for the relay link

-Preamble-



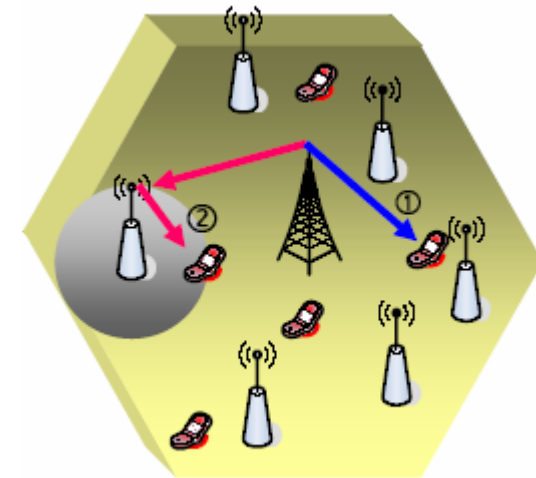
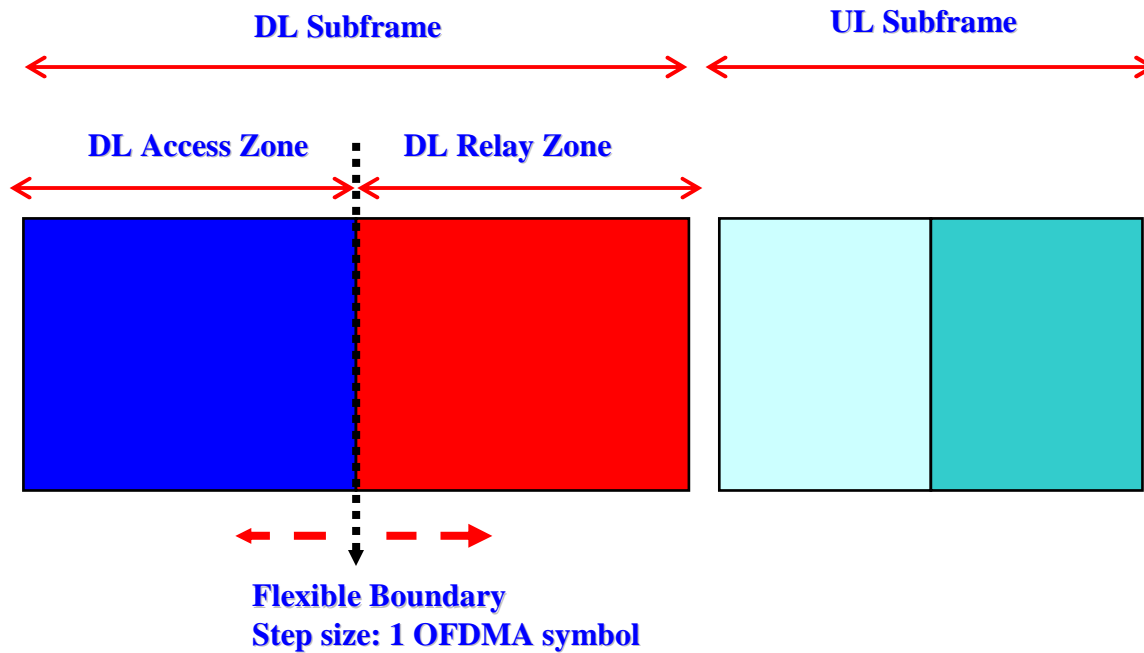
-flexibility is satisfied
However, time alignment is **not** satisfied-



-time alignment is satisfied
However, flexibility is **not** satisfied-

Both flexibility and time alignment can **not** be satisfied **simultaneously**

Performance Result -Load Balancing-



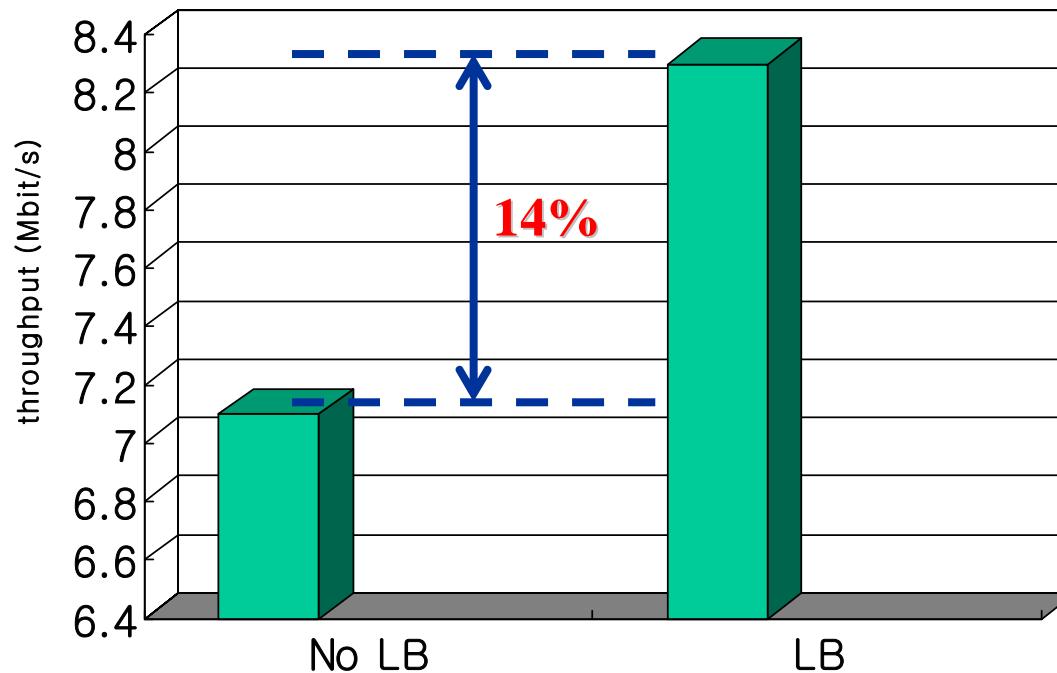
1 frame: 42 OFDMA symbols
DL subframe: UL subframe=27:15

Load Balancing (Simulation Parameter)

Frequency Band	2.3GHz
Bandwidth	10MHz
Cell layout	10 cells-wrap around
Cell radius	1km
Sectorization	No (omni antenna)
RS configuration	6 Fixed RS per cell, 2/3 position from MR-BS
BS Power	20W
RS Power	10W
Channel model (BS-RS link)	Path-loss: LOS(Winner model), Shadow fading:3.4dB
Channel model (BS-MS link/RS-MS link)	Path-loss: NLOS (Winner model), Shadow fading: 8dB Multi-path fading: ITU-R Pedestrian A model
Mobile speed	3km/h
Scheduling	Round Robin
Traffic model	Ethernet model (Average rate ~100kbps) Arrival process: Pareto distribution($\alpha=1.3$) Average packet size=2944.8bits

Cell Throughput Comparison

(No Load Balancing (No LB) vs. Load Balancing(LB))



Number of users in a cell: 100

Summary

- Frame Structure for multi-hop relay
 - Generalized frame structure
 - Supports various multi-hop frame structure configurations
 - Detailed minimum configuration of frame structure
 - Term change: zone => interval
 - The first access interval shall include preamble, FCH, DL(UL) MAP
- Postamble for the relay link
 - Time aligned amble location
 - Postamble supports both time alignment and flexibility of resource allocation between access and relay intervals.