

Proposal of an RS Concept Utilizing True Sectoring Capabilities

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Base Document:

None

Purpose:

Propose an RS concept which combines flexibility, efficiency and it's implementable using existing technologies. Point out related issues to be addressed in standard.

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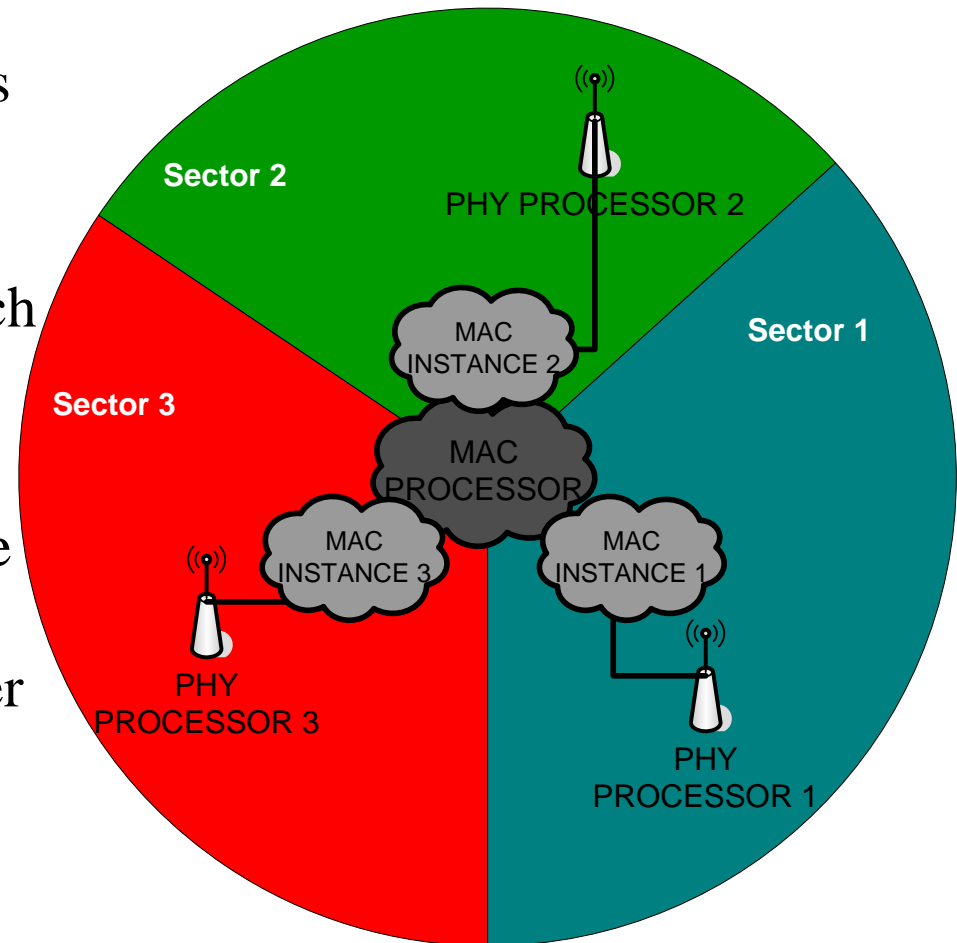
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Outline

- Presentation of “True Sectoring” concept
- Presentation of a RS approach
- RS related MAC SAP issues
- RS related PHY SAP issues
- Allocate points of needed amendments in the context of P802.16j baseline document

True Sectoring Support

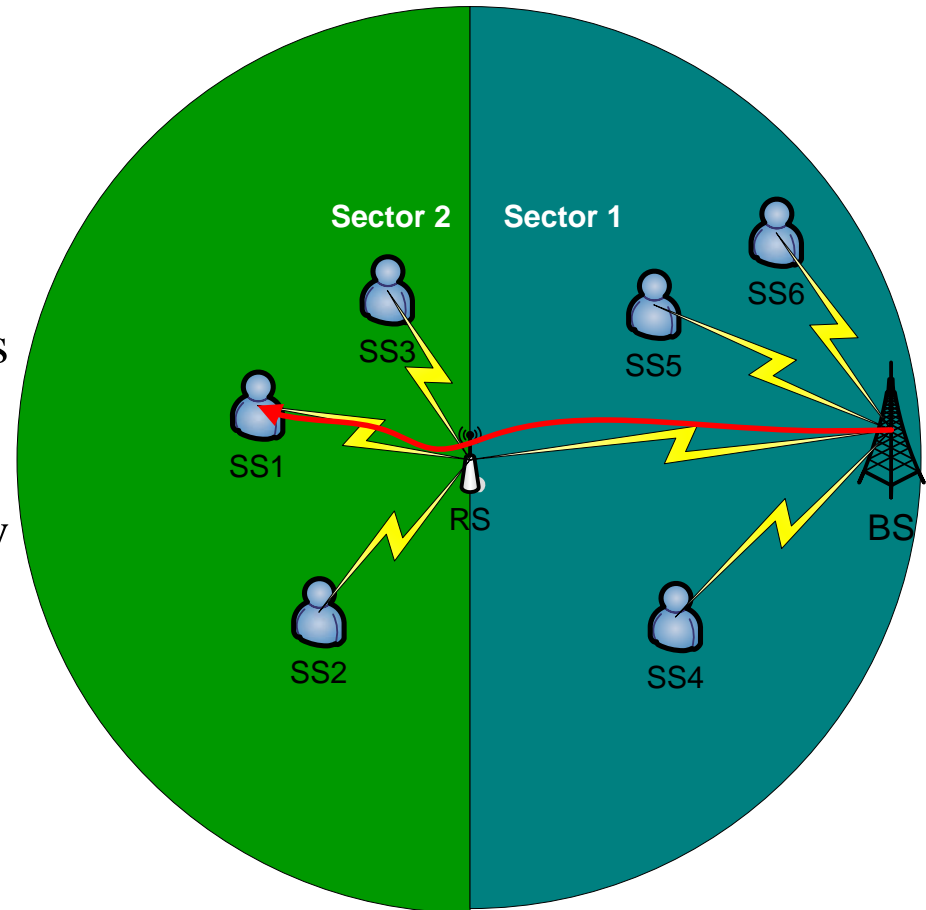
- One MAC processor incorporates adequate number of MAC instances depending upon the number of sectors
- One PHY processor assigned to each sector
- Directional antennas utilized
- Each combination of MAC instance – PHY processor forms a logical system not interfering with the other due to directional antennas
- Figure to the right shows conceptually a three sector system



Proposing a RS concept

Back-to-back RS concept

- ✓ Assumption : RS node supports true sectoring
- RS incorporates both BS and SS functionalities
- One sector behaves like an SS towards the BS while the others like BSs towards associated SSs
- One sector receives the data to be forwarded, and the a second one actually forwards them to the right SS
- i.e. in a 2-sector system, sector 1 MAC instance
 - Receives data
 - Determines the final destination
 - Data are transmitted to final destination by sector 2 MAC instance



Proposing a RS concept

Back-to-back RS concept

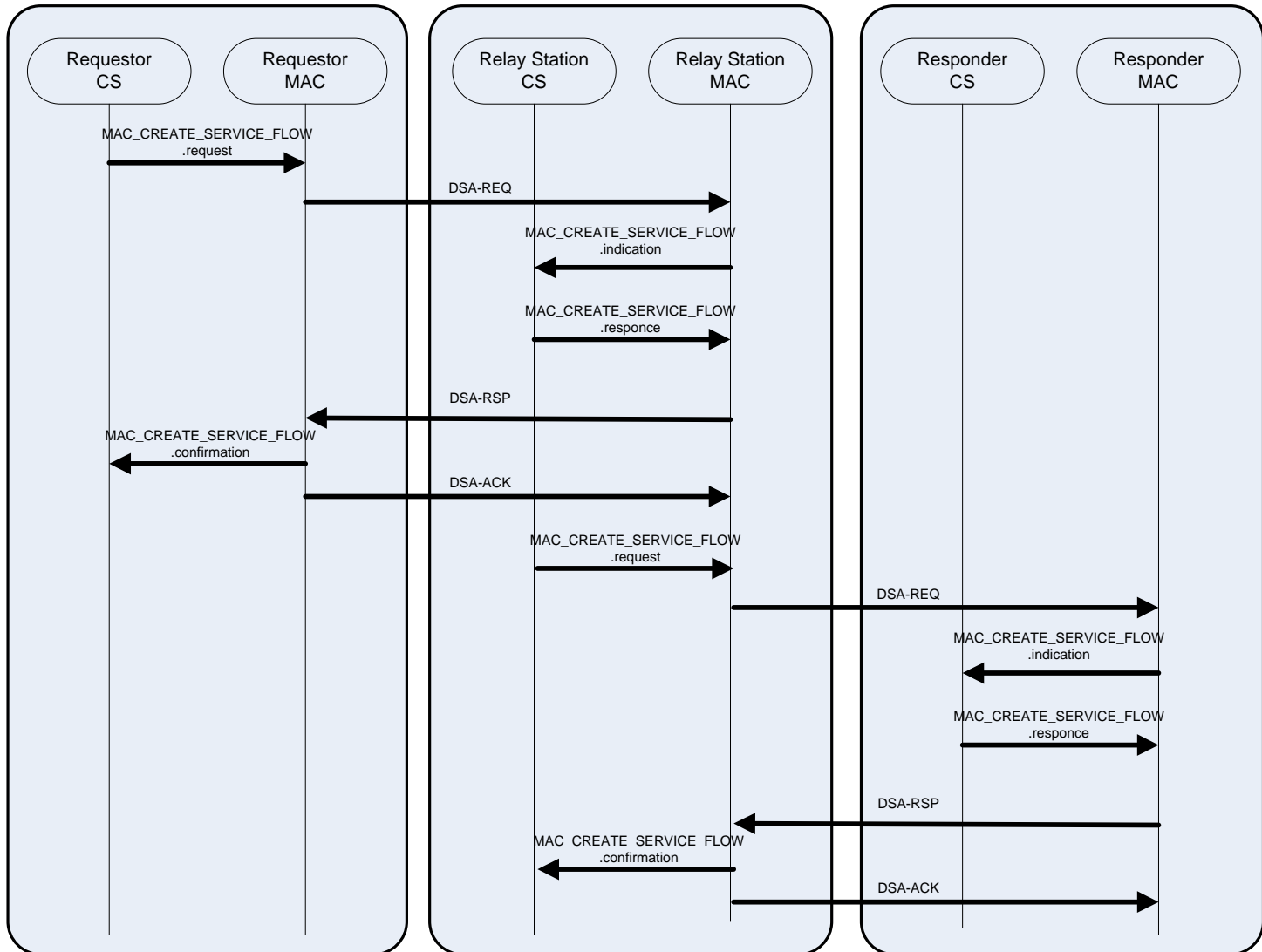
- Features
 - Provides maximum degree of backwards compatibility to existing SS and BS designs
 - SS “sees” the sector to which it is associated as a standard compliant BS
 - BS “sees” the sector to which it is associated as a standard compliant SS
 - True sectoring technology is available
 - Spatial reuse is easily to implement
 - Standard scheduling algorithms work although new can provide considerable performance enhancement
 - Simpler and faster handover procedures between sectors

RS related MAC SAP issues (1/3)

- Concerning the standard new issues arise related to the RS involvement to connection establishment
 - End-to-end connection establishment procedure vs Split connection establishment procedure as depicted in following figures

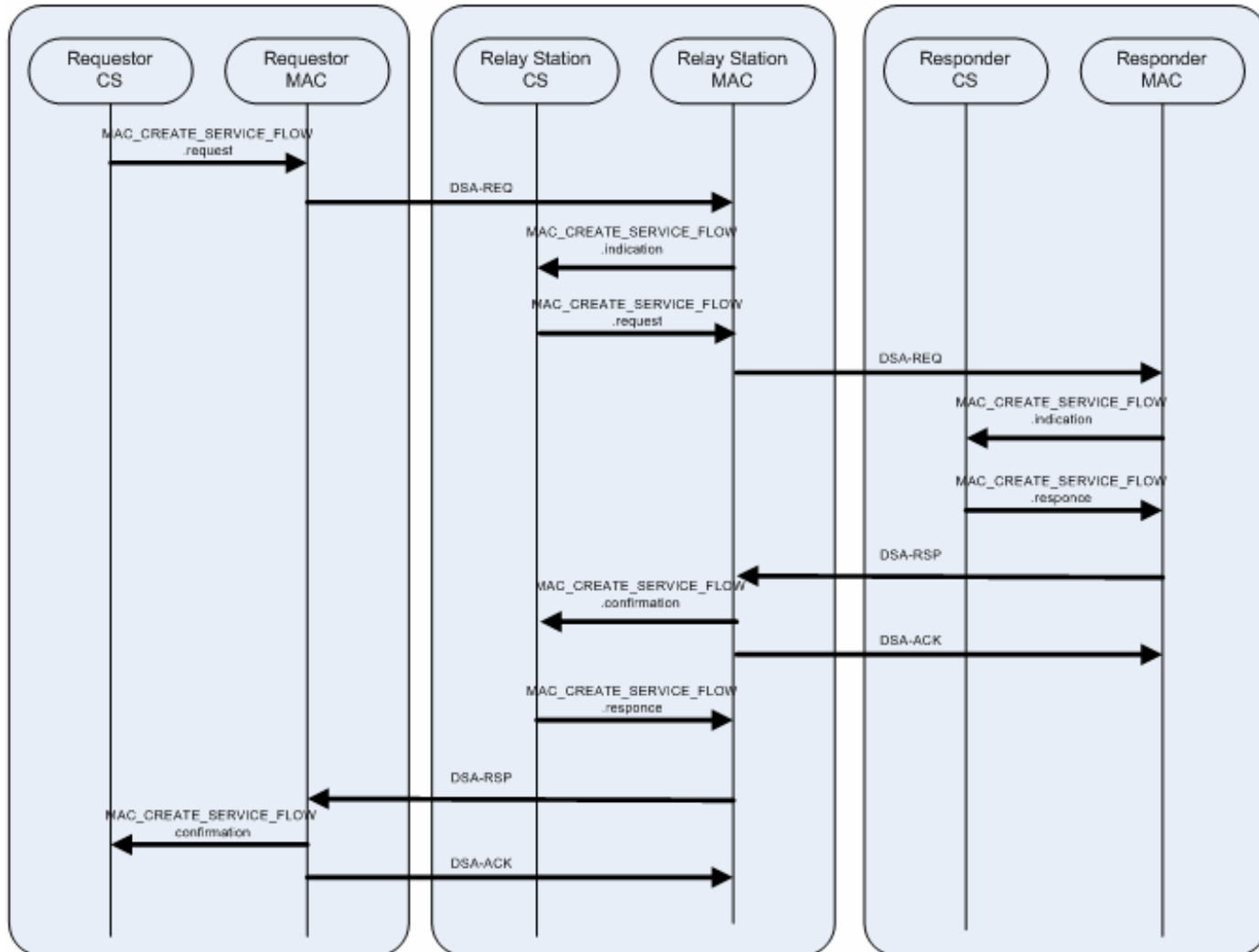
RS related MAC SAP issues (2/3)

- Split connection procedure



RS related MAC SAP issues (3/3)

- End-to-end connection procedure



RS related PHY SAP issues

- Concerning the standard, new amendment will be needed related to necessary PHY SAP primitive in order to support true sectoring
 - INTEL has already presented its own concept in “OFDMA PHY SAP Interface Specification for 802.16 Broadband Wireless Access Base Stations”
Revision: 2.28, Date: May 22, 2006

Allocate points of needed amendments in the IEEE 802.16 Standard

- According to the P802.16j baseline document in order to incorporate this approach amendment will be needed in 6.1.1
- Concerning the PHY SAP issues amendment will be needed in 6.3.7.7
- Considering the IEEE 802.16e document some amendment will be needed in Annex regarding the MAC SAP procedures presented here