Proposal for Adaptive HARQ ACID Expansion on Relay Links

IEEE 802.16 Presentation Submission Template (Rev. 8.3)

Document Number:

IEEE S802.16j-07/116

Date Submitted:

2007-01-08

Source:

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Venue:

IEEE 802.16 Session #47, London, UK

Base Document:

None

Purpose:

Propose to adopt the adaptive HARQ ACID expansion mechanism described herein into IEEE 802.16j.

Proposal for Adaptive HARQ ACID Expansion on Relay Links

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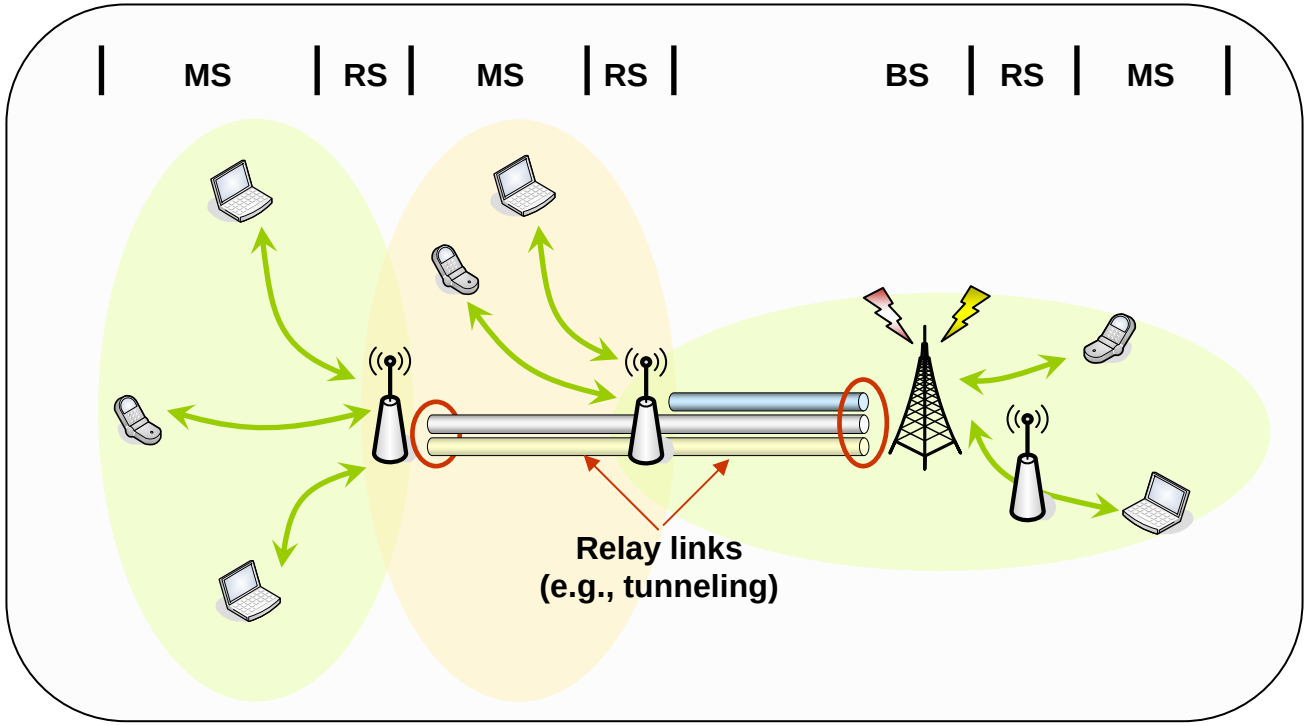
Requirement of Relay Links

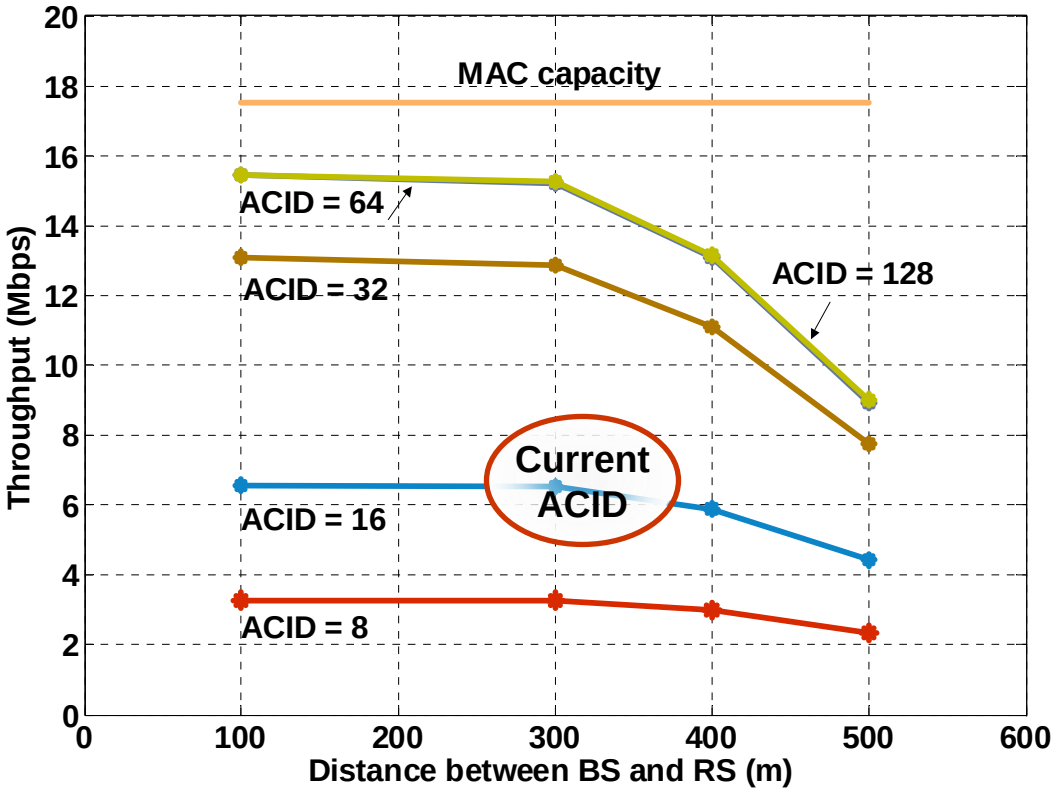
- Relay stations have to carry traffic initiated from or terminated at all the MSs associated with it.
  - Traffic aggregation naturally occurs on relay links.

- High performance is thus demanded, in order to support aggregated traffic on relay links.



Problem of Current HARQ ACID Size

- **Major findings:**
  - As the number parallel HARQ channels decreases, the achievable throughput drops significantly.
  - Current HARQ ACID field can support up to 16 HARQ channels.



Proposed Solution Approach

- Expand ACID field to be ***8-bit*** long in the HARQ-related IEs.
  - For example, the DL HARQ Chase sub-burst IE will assume the format as follows:

Table 286m —DL HARQ Chase sub-burst IE format

Syntax	Size	Notes
…		
}		
ACID	8 bits	The ACID field is extended to 8 bits
AI_SN	1 bit	
ACK disable	1 bit	
Dedicated DL Control Indicator	2 bits	
Reserved	4 bits	
…		

- The actual number of parallel HARQ channels supported can be indicated by
  - ***OFDMA SS modulator TLV*** and ***OFDMA SS demodulator TLV*** in SBC-REQ/SBC-RSP handshake.

- These two TLVs specify the number of UL and DL HARQ channels the SS/MS support, which can be in the range of [1, 255].

Proposed Solution Approach

- The actual number of parallel HARQ channels to be used can be specified and negotiated by
  - ***HARQ services flow TLV*** in DSA-REQ/DSA-RSP, and REG-REQ/REG-RSP handshake.

- The HARQ Service Flows TLV not only indicates whether the connection uses HARQ or not, but also conveys the number of HARQ channels that the HARQ transmitter desire to use.

HARQ Service Flows TLV

Type	Length	Value	Scope
[145/146].44	1	0 = Non-HARQ (Default) *1 = HARQ connection* *Support 1 HARQ channel* *2 = HARQ connection* *Support 2 HARQ channels* *...* *255 = HARQ connection* *Support 255 HARQ channels*	DSA-REQ, DSA-RSP, REG-REQ, REG-RSP