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Re:	Call for contribution and comments.
Abstract	Fix for HO Race Condition Issue.
Purpose	Adoption
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Fix for HO Race Condition Issue

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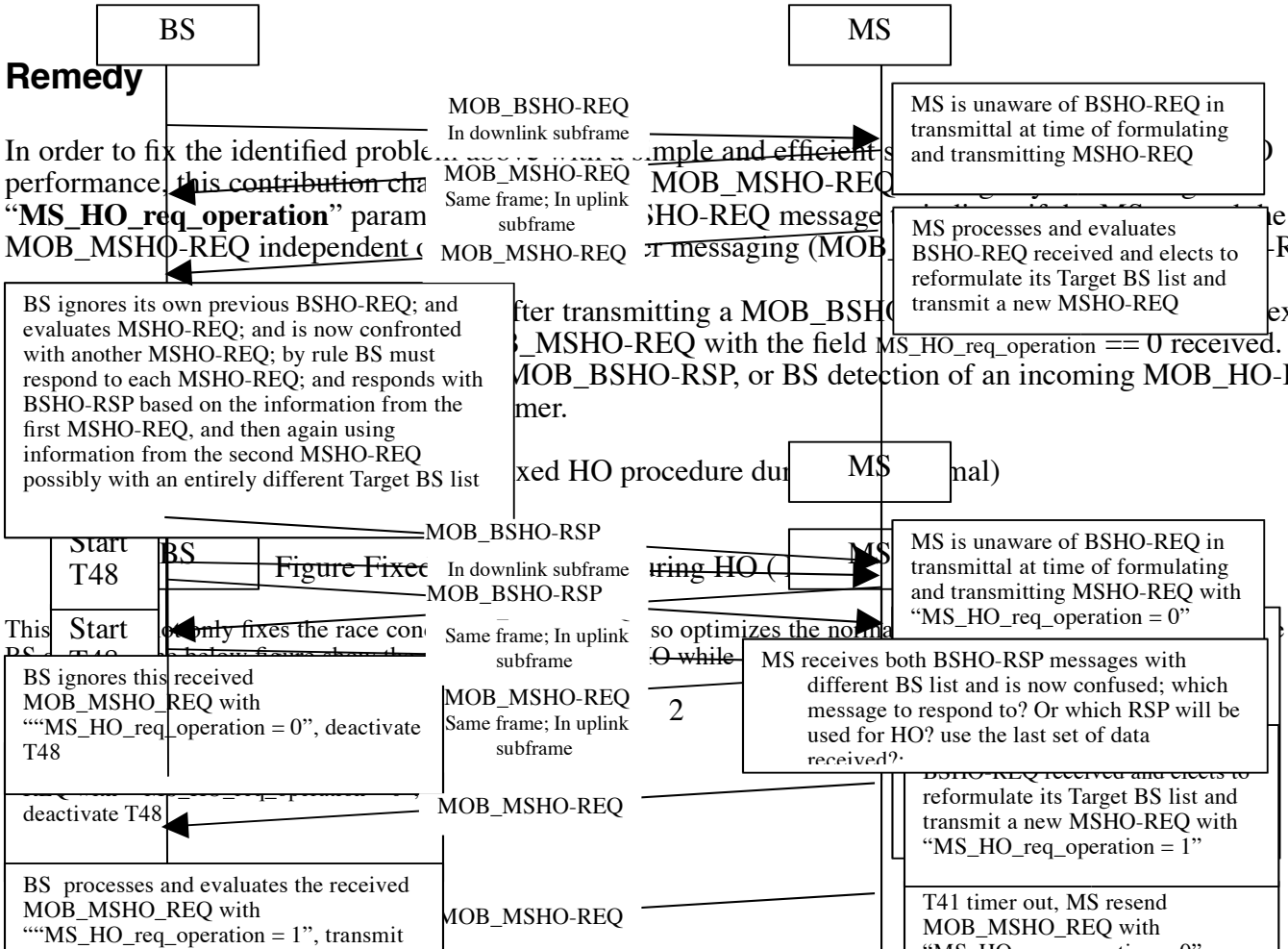
Problem Definition

Handover can be initiated either by BS or MS independently based on information they collect. Therefore, it is highly possible that the MS and BS may initiate the HO by sending HO request to each other at the same time (in the same frame) without knowledge that the peer is also initiating HO request, creating a race condition. The current standard has the following definition to handle this race condition.

"If an MS that transmitted a MOB_MSHO-REQ message detects an incoming MOB_BSHO-REQ message, it may respond with a MOB_MSHO-REQ or a MOB_HO-IND message and ignore its own previous request. A BS that transmitted a MOB_BSHO-REQ message and detects an incoming MOB_MSHO-REQ message from the same MS shall ignore its **MOB_BSHO-REQ [emphasis added]**. A BS that transmitted a MOB_BSHO-REQ message and detects an incoming MOB_HO-IND message from the same MS shall ignore its own previous request. "

> NOTE: the bold text is the corrected message. This was changed in error, breaking message flow, for the D8 document and carried into the D9 document and there is a comment to remedy this.

Under the situation which BS transmits MOB_BSHO_REQ and MS transmits MOB_MSHO_REQ at the same time (or at least within the message processing latency), the problems of the current standard definition are:



Remedy

In order to fix the identified proble… mple and efficient s… performance, this contribution cha… MOB_MSHO-REQ … "**MS_HO_req_operation**" param… SHO-REQ message … MOB_MSHO-REQ independent … messaging (MOB… -RSP).

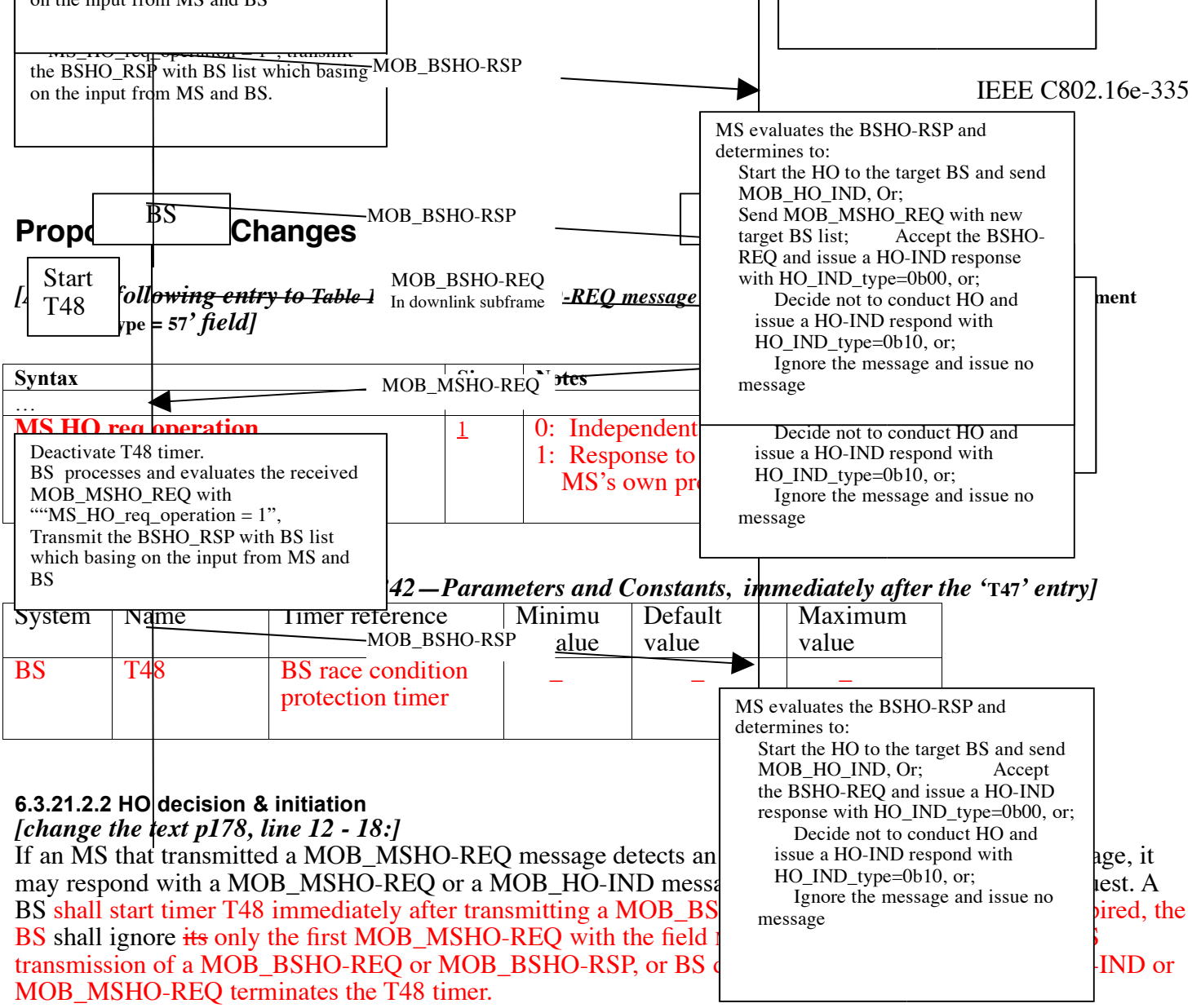
…fter transmitting a MOB_BSH… expired, …_MSHO-REQ with the field MS_HO_req_operation == 0 received. BS …MOB_BSHO-RSP, or BS detection of an incoming MOB_HO-IND or …mer.

…xed HO procedure du… mal)

Figure Fixed … uring HO (…

This … only fixes the race con… so optimizes the norma… between … O while … 2

MS
MS is unaware of BSHO-REQ in transmittal at time of formulating and transmitting MSHO-REQ with "MS_HO_req_operation = 0"
MS receives both BSHO-RSP messages with different BS list and is now confused; which message to respond to? Or which RSP will be used for HO? use the last set of data received?
…BSHO-REQ received and elects to reformulate its Target BS list and transmit a new MSHO-REQ with "MS_HO_req_operation = 1"
T41 timer out, MS resend MOB_MSHO_REQ with …



Propo Changes

[A following entry to Table 1

-REQ message

ment

ype = 57' field]

Syntax	Size	Notes
…		
MS HO req operation	1	0: Independent 1: Response to MS's own pr

42—Parameters and Constants, immediately after the 'T47' entry]

System	Name	Timer reference	Minimu alue	Default value	Maximum value
BS	T48	BS race condition protection timer	_	_	_

6.3.21.2.2 HO decision & initiation

[change the text p178, line 12 - 18:]

If an MS that transmitted a MOB_MSHO-REQ message detects an age, it may respond with a MOB_MSHO-REQ or a MOB_HO-IND messa est. A BS shall start timer T48 immediately after transmitting a MOB_BS pired, the BS shall ignore ~~its~~ only the first MOB_MSHO-REQ with the field transmission of a MOB_BSHO-REQ or MOB_BSHO-RSP, or BS IND or MOB_MSHO-REQ terminates the T48 timer.

6.3.21.3.1 SHO decision and initiation

[change the text p188, line 1 – 5 to following text:]

If an MS that transmitted a MOB_MSHO-REQ message detects an incoming MOB_BSHO-REQ message, it may respond with a MOB_MSHO-REQ or a MOB_HO-IND message and ignore its own previous request. ~~Similarly, a BS that transmitted a MOB_BSHO-REQ message and detects an incoming MOB_MSHO-REQ or MOB_HO-IND message from the same MS shall ignore its own previous request.~~ A BS shall start timer T48 immediately after transmitting a MOB_BSHO-REQ. While timer T48 is unexpired, the BS shall ignore ~~its~~ only the first MOB_MSHO-REQ with the field MS_HO_req_operation == 0 received. BS transmission of a MOB_BSHO-REQ or MOB_BSHO-RSP, or BS detection of an incoming MOB_HO-IND or MOB_MSHO-REQ terminates the T48 timer.

6.3.21.3.2 FBSS Decision and Initiation

[change the text p189, line 1 – 5 to following text:]

If an MS that transmitted a MOB_MSHO-REQ message detects an incoming MOB_BSHO-REQ message, it

may respond with a MOB_MSHO-REQ or a MOB_HO-IND message and ignore its own previous request. ~~Similarly, a BS that transmitted a MOB_BSHO-REQ message and detects an incoming MOB_MSHO-REQ or MOB_HO-IND message from the same MS shall ignore its own previous request.~~ A BS shall start timer T48 immediately after transmitting a MOB_BSHO-REQ. While timer T48 is unexpired, the BS shall ignore ~~its~~ only the first MOB_MSHO-REQ with the field MS_HO_req_operation == 0 received. BS transmission of a MOB_BSHO-REQ or MOB_BSHO-RSP, or BS detection of an incoming MOB_HO-IND or MOB_MSHO-REQ terminates the T48 timer.

Operator Operator
Network Network