

Dpto. Ingeniería de Comunicaciones. University of Málaga

Monitor MAC. Description

Wireless Mobile Simulator (WiMo-SIM)

1. Introduction

This document gives a brief description of all the results which can be monitored in order to analyze the resource allocation made by the scheduler during the simulation. A complete list with all the results generated can be found in the following section. The list presented will contain the name of each parameter, the dimension associated to each one (since all the generated results have a matrix nature) and a description of the information represented by each parameter.

In addition, this document gives details about how to generate this results and how to analyze it.

2. Monitor MAC results' description

Name	Dimension		Description
alloc_IdHarqCh	$nSubFrames$ ($nCC \cdot nCw \cdot nPRBs$)	x	In position 'i'j', HARQ channel identifier for the transmission of information over the PRB associated to index j in the monitored subframe i .
alloc_IdUser	$nSubFrames$ ($nCC \cdot nCw \cdot nPRBs$)	x	In position 'i'j', user identifier the PRB associated to index j has been assigned to in the monitored subframe i .
alloc_ModLevel	$nSubFrames$ ($nCC \cdot nCw \cdot nPRBs$)	x	In position 'i'j', modulation level assigned for the transmission of information over the PRB associated to index j in the monitored subframe i .
alloc_RedVersion	$nSubFrames$ ($nCC \cdot nCw \cdot nPRBs$)	x	In position 'i'j', redundancy version associated to the transmission of information over the PRB associated to index j in the monitored subframe i .
alloc_TbSize	$nSubFrames$ ($nCC \cdot nCw \cdot nPRBs$)	x	In position 'i'j', TB size associated for the transmission of information over the PRB associated to index j in the monitored subframe i .
bufferOccupation	$nSubFrames \times nUsers$		In position 'i'j', number of packets in the queue of user j in the monitored subframe i .
cqi	$nSubFrames$ ($nCC \cdot nCw \cdot nPRBs \cdot nUsers$)	x	Channel Quality Indicator (CQI) associated to each combination of PRB and user. Each position contains the CQI considered by the scheduler in order to do the resource allocation.

Table 1. Results associated to the scheduler module

3. How to obtain and analyze Monitor MAC results

If you want that WiMo-SIM will generate the results associated to the scheduler module, the following steps must be taken:

1. Drag the *Params.xml* file to the *WM-Settings* application.
2. Select the value *true* associated to the parameter *monitorMAC* in the box *Monitoring* in the tab *CONFIG*.
3. Select the subframes to monitor. This is done by means of the parameters:
 - a. *subFrameIniMAC*: Identifier of the first subframe which will be monitored.
 - b. *subFrameStepMAC*: Step used to determine the subframes which will be monitored.
 - c. *subFrameNumMAC*: Total number of subframe which will be monitored.

For example, if the values *subFrameIniMAC* = 10; *subFrameStepMAC* = 3 and *subFrameNumMAC* = 5 are used, the monitored subframes will be subframes number 10, 13, 16, 19 and 21.

It should be noted that the configuration used should not exceed the number of total subframes simulated (determined by the parameter *iterationsNumber* in box *Simulation* in tab *CONFIG*), i.e. the previous example would not be valid if the total simulated subframes number is 20 (*iterationsNumber* = 20).

4. Save the changes by clicking **File → Save**.
5. Close the *WM-Settings* application and double click in the *WM-SIM* application. This will run the simulator using the given parameter configuration.
6. When the simulation run finished, in the result folder associated to it [1], there will appear several *.mat* files associated to the scheduler module. The name of these *.mat* files will be *monitorMAC_CeldaX_simulation* (where *X* is the identifier of the cell to which the file is associated), plus the value and the name of the variable parameters defined in the tab *VAR_PARAM* [1]. Hence, there will be as Matlab files as the multiplication of the number of variations associated to each variable parameter defined and the number of cells simulated. If no variable parameters have been defined, this part of the name will be omitted and the name of the file will be *monitorMAC_CeldaX_simulation.mat* (where *X* is the identifier of the cell to which the file is associated).
7. To obtain a graphical representation of the results generated, the matlab function *GetMonitorMacResult.m* can be used. The *.m* file should be in the *exe_release* folder and a complete description of the parameter is presented in the following table:

Name	Description
path	String with the path in order to load the file to be analyzed.
fileName	Name of the file (including the extension) which contain the results we want to analyze.
idCell	Cell identifier.
nUsers	Number of users considered in the simulation.
nCC	Number of Component Carrier (CC) simulated.
nCws	Number of codewords simulated.
nPRBs	Bandwidth simulated expressed in PRBs.
sfIni	Identifier of the first monitored subframe which will be analyzed.
sfVar	Total number of monitored subframes which will be analyzed.
sfVar	Step used to determine the monitored subframes which will be analyzed.

Table 2. Inputs associated to the Matlab function *GetMonitorMacResults*

The function should be executed as many times as number of *.mat* files we want to analyze, changing the parameter *fileName* each time.

Once it has been executed, the number of figures generated in the result folder indicated in the parameter *path* will be:

$$1 + (5 + nUsers) \cdot nCC \cdot nCw$$

The following figure depicts an example of the kind of figure generated:

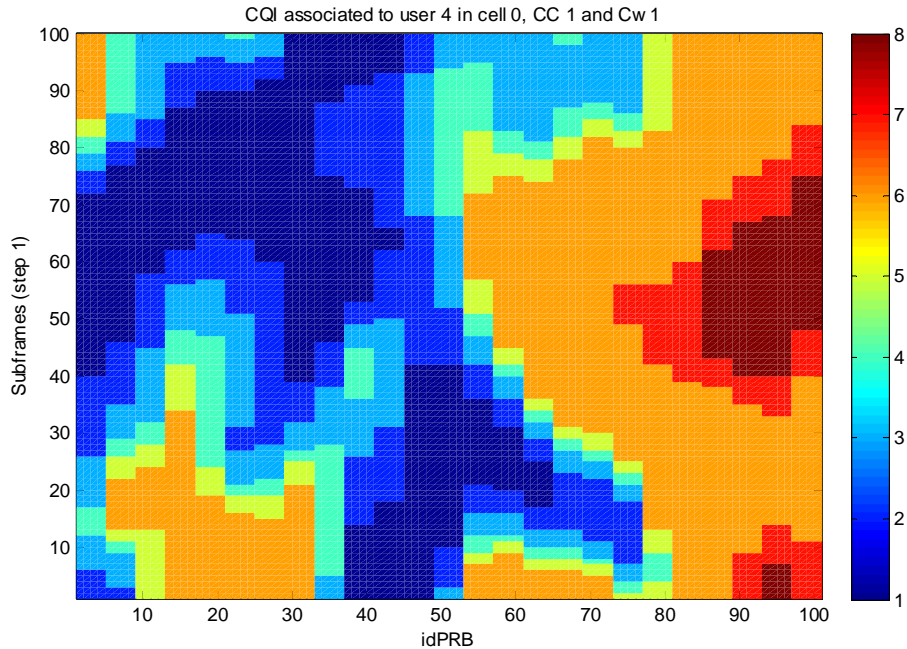


Figure 1. Example of the kind of figures generated by the Matlab function *GetMonitorMacResults*

4. Acronyms

CC	Component Carrier
CQI	Channel Quality Indicator
HARQ	Hybrid Automatic Repeat Request
MAC	Medium Access Control
PRB	Physical Resource Block
TB	Transport Block
WiMo-SIM	Wireless Mobile SIMulator

5. References

- [1] Params_Description_v2.1.pdf