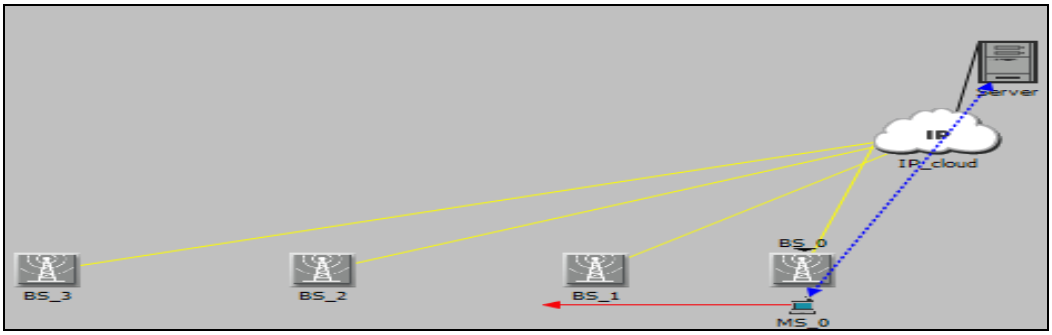
Additional file 1 Detail on simulation scenario configuration



1.Topology

Number of cells	4
Distance between BS_0 and BS_1 (m)	1200
Distance between BS_1 and BS_2 (m)	1200
Distance between BS_2 and BS_3 (m)	1200
MS's speed (m/s)	27,78
Dwelling time (s)	43,2

Trajectory	X Pos (m)	Y Pos (m)
Initial Position	0	0
Final Position	-2500	0

Antennas' height	
BS_0, BS_1, BS_2, BS_3	70 m
MS_0	2 m

Antenna Gain (dBi)	
BS_0, BS_1, BS_2, BS_3	15
MS	-1

Maximum Transmision Power	
BS_0, BS_1, BS_2, BS_3	2W
MS	1W

BS	Permutation Base (BSID)	Neighbourhood ID
BS_0	0	0
BS_1	1	0
BS_2	2	0
BS_3	3	0

2.Air Link Channel

Multipath Channel Model	ITU Vehicular B
Pathloss Model	Vehicular Environment
Terrain Type	burban Fixed Terrain Type C
Shadow Fading Standard Deviation	10

3.Physical Layer Parameters

PHY Profile

PHY Profile	WirelessOFDMA 5Mhz
PHY Profile Type	OFDM
Frame Duration (ms)	5
Symbol Duration	100.8 µsec
Number of Subcarriers	512
Duplexing Technique	TDD
TC Overhead Factor	0.0
Base Frequency	5.8 GHz
Bandwidth	20 MHz
Frequency Division in UL Zones	512-FFT PUSC
Frequency Division in DL Zones	512-FFT PUSC

Frame Structure

Frame Preambles	1 symbol
TTG	100.8 µsec
RTG	302.4 µsec
UL/DL Boundary	Fixed
DL-MAP Repetition Count	Repetition Coding of 4
DL Information Element Size	32 bits
Contention Area (Initial Ranging Area)	One Slot (6x2)
Contention Area (Periodic Ranging/Bandwidth Request Area)	One Slot (6x1)

4.Traffic Configuration

Handover Policy	RMPA (distance based)

Service Class Definitions

Service Class Name	Scheduling Type	Maximum Sustained Traffic Rate	Minimum Reserved Traffic Rate	Maximum Latency (ms)
Bronze	Best Effort	384 Kbps	384 Kbps	30.0
Silver	rtPS	384 Kbps	384 Kbps	30.0
Gold	rtPS	384 Kbps	384 Kbps	30.0
Platinum	UGS	5 Mbps	5 Mbps	30.0

Classifier Definitions

BS_0, BS_1, BS_2, BS_3	
IP ToS	Service Class
Excellent Effort (3)	Silver
Interactive Voice (6)	Platinum
MS	
IP ToS	Service Class
Excellent Effort (3)	Silver

Service Flow Definitions

Downlink Service Flow						
Service Flow ID	Sevice Class Name	Initial Modulation	Initial Code Rate	Average SDU Size	Activity Idle Timer	Buffer Size
0	Silver	64-QAM	¾	1500 bytes	60 s	64KB
Uplink Service Flow						
Service Flow ID	Sevice Class Name	Initial Modulation	Initial Code Rate	Average SDU Size	Activity Idle Timer	Buffer Size
0	Silver	64-QAM	¾	1500 bytes	60 s	64KB

Type of traffic

1. Server --> MS_0	
IP traffic flow (64KB = 10 packets/second)	
Protocol	IP
Type of Service	Best Effort (0)
Overhead/Segmentation	None
SLA Parameters	Not Set
2. MS_0 --> Server	
IP traffic flow (64KB = 10 packets/second)	
Protocol	IP
Type of Service	Best Effort (0)
Overhead/Segmentation	None
SLA Parameters	Not Set

5.WiMax Parameters

Handover Policy	RMPA (distance based)

BS	
Received Power Tolerance	
Minimum Power Density	-100 dBm/subchannel
Maximum Power Density	- 60 dBm/subchannel
CDMA Codes	
Number of Initial Ranging Codes	8
Number of HO Ranging Codes	8
Number of Periodic Ranging Codes	8
Number of Bandwidth Request Codes	8
Backoff Parameters	
Ranging Backoff Start	2
Ranging Backoff End	4
Bandwidth Request Backoff Start	2
Bandwidth Request Backoff End	4
Neighbour Advertisement Parameters	
Neighbour Advertisement Interval	10 Frames
Scanning Parameters	
MS	
Ranging Power Step	0.25mW
Timer	
T3*	50 ms
Handover Parameters	
MS Handover Retransmission Timer	30 ms
Maximum Handover Request Retransmissions	6

**Resource Retain Time	200 ms