#General parameters
set stop 100
set type gsm
#AQM parameters
set minth 30
set maxth 0
set adaptive 1
#traffic generation
set flows 0
set window 30
#plotting statistics
set opt(wrap) 100 set opt(srcTrace) is set opt(dstTrace) bs2
#default downlink bandwidth in bps
set bwDL(gsm) 9600
#**default propogation delay in sec**
set propDL(gsm) .500
set ns [new Simulator] set tf [open Mlab5.tr w]
$ns trace-all $tf
set nodes(is) [$ns node] set nodes(ms) [$ns node] set nodes(bs1) [$ns node] set nodes(bs2) [$ns node] set nodes(lp) [$ns node]
proc cell_topo {} {
global ns nodes
$ns duplex-link $nodes(lp) $nodes(bs1) 3Mbps 10ms DropTail
$ns duplex-link $nodes(bs1) $nodes(ms) 1 1 RED
$ns duplex-link $nodes(ms) $nodes(bs2) 1 1 RED
$ns duplex-link $nodes(bs2) $nodes(is) 3Mbps 50ms DropTail puts "GSM Cell Topology" }
proc set_link_params {t} {
global ns nodes bwDL propDL
$ns bandwidth $nodes(bs1) $nodes(ms) $bwDL($t) duplex
$ns bandwidth $nodes(bs2) $nodes(ms) $bwDL($t) duplex
$ns delay $nodes(bs1) $nodes(ms) $propDL($t) duplex

```
$ns delay $nodes(bs2) $nodes(ms) $propDL($t) duplex
$ns queue-limit $nodes(bs1) $nodes(ms) 10
$ns queue-limit $nodes(bs2) $nodes(ms) 10   }
#RED and TCP parameters
 Queue/RED set adaptive_ $adaptive
 Queue/RED set thresh_ $minth
Queue/RED set  maxthresh_ $maxth
Agent/TCP set window_ $window
#create topology
 switch $type {
gsm -  umts {cell_topo}      }
set_link_params $type
$ns insert-delayer $nodes(ms) $nodes(bs1) [new Delayer]
$ns insert-delayer $nodes(ms) $nodes(bs2) [new Delayer]
# set up TCP connection
 if {$flows == 0} {
set tcp1 [$ns create-connection TCP/Sack1 $nodes(is)
TCPSink/Sack1 $nodes(lp) 0]
set ftp1 [[set tcp1] attach-app FTP]
$ns at 0.8 "[set ftp1] start"
}
proc stop {} {
global nodes opt tf
set wrap $opt(wrap)
set sid [$nodes($opt(srcTrace)) id]
 set did [$nodes($opt(dstTrace)) id]
set a "Mlab5.tr"
set GETRC "../bin/getrc"
set RAW2XG "../bin/raw2xg"
exec $GETRC -s $sid -d $did -f 0 Mlab5.tr | \
$RAW2XG -s 0.01 -m $wrap -r > plot.xgr
exec $GETRC -s $did -d $sid -f 0 Mlab5.tr | \
$RAW2XG -a -s 0.01 -m $wrap >> plot.xgr
exec xgraph -x time -y packets plot.xgr &
 exit 0   }
$ns at $stop "stop"
$ns run
```