1. Implement and study the performance of GSM on NS2/NS3 (Using MAC layer) or equivalent environment.

# General Parameters

set stop 100; # Stop time.

# Topology

set type gsm; #type of link:

# AQM parameters

set minth 30

set maxth 0

set adaptive 1; # 1 for Adaptive RED, 0 for plain RED

# Traffic generation.

set flows 0; # number of long-lived TCP flows

set window 30; # window for long-lived traffic

# Plotting statistics.

set opt(wrap) 100; # wrap plots?

set opt(srcTrace) is; # where to plot traffic

set opt(dstTrace) bs2; # where to plot traffic

#default downlink bandwidth in bps

set bwDL(gsm) 9600

#default downlink propagation delay in seconds

set propDL(gsm) .500

set ns [new Simulator]

set tf [open out.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

source web.tcl

#Create topology

switch $type {

gsm -

cdma {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 forward 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 "out.tr"

set GETRC "../../../bin/getrc"

set RAW2XG "../../../bin/raw2xg"

exec $GETRC -s $sid -d $did -f 0 out.tr | \

$RAW2XG -s 0.01 -m $wrap -r > plot.xgr

exec $GETRC -s $did -d $sid -f 0 out.tr | \

$RAW2XG -a -s 0.01 -m $wrap >> plot.xgr

exec xgraph -x time -y packets plot.xgr &

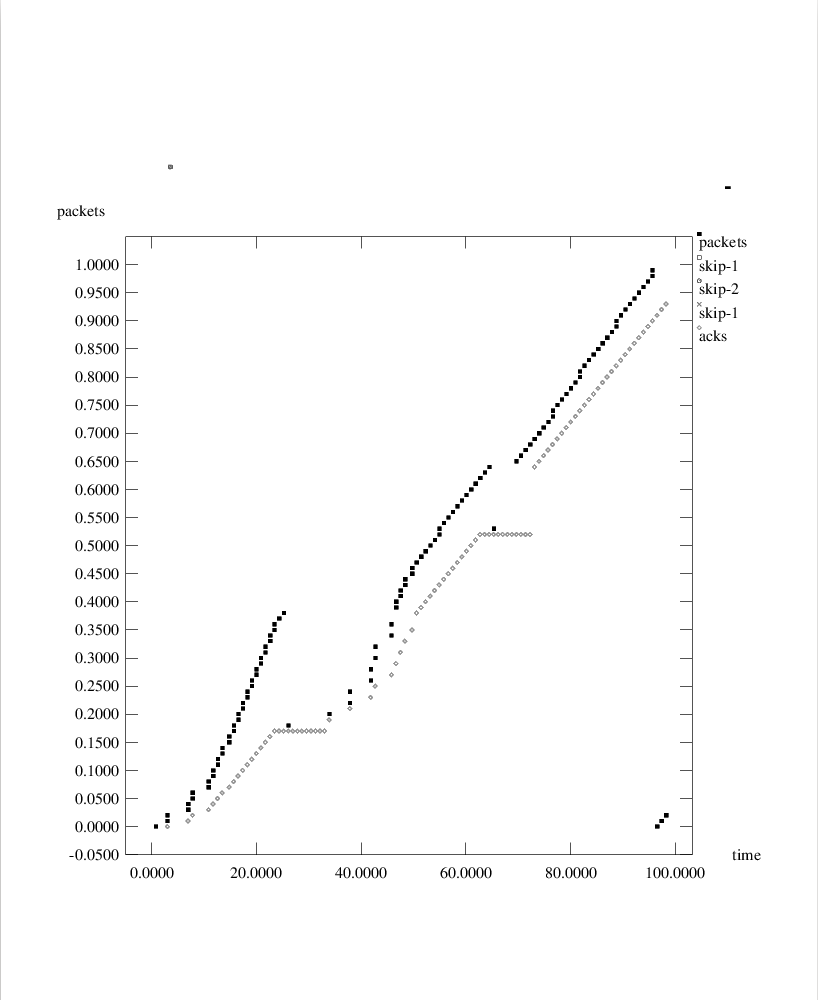
exit 0

}

$ns at $stop "stop"

$ns run

Output:



GSM Trace File:

