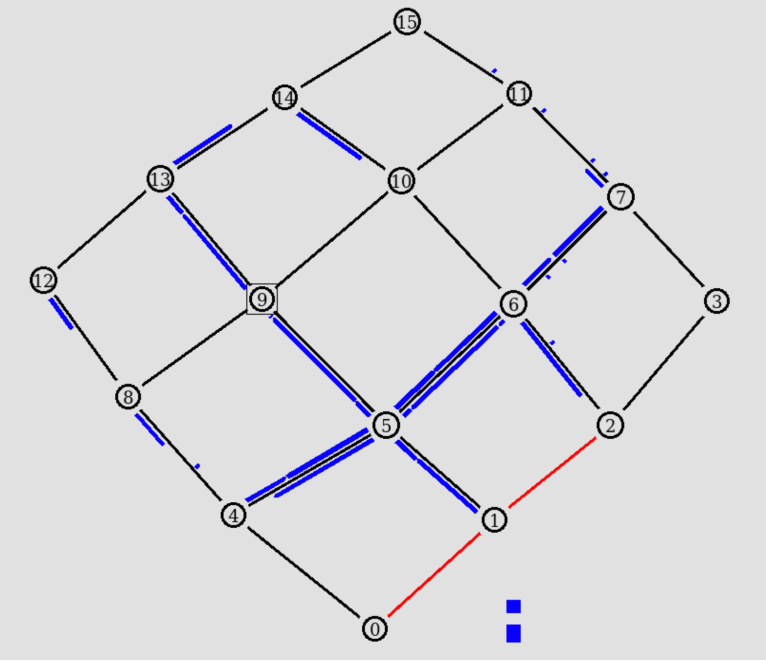
Code:-
======

```
# new simulator object
set ns [new Simulator]

$ns color 1 Blue

set s [ lindex $argv 0 ]
set ss [expr $s * $s]
set proto [ lindex $argv 1 ]

# set protocol
$ns rtproto $proto

# set failure true or not
set failbool [lindex $argv 2]
# setting files for trace and nam data
set namtracefile [open out.nam w]
set tracefile [open out.tr w]
$ns namtrace-all $namtracefile
$ns trace-all $tracefile


# defining finish procedure to close files
proc finish {} {
    global ns namtracefile tracefile
    $ns flush-trace
    close $namtracefile
    close $tracefile
    #exec nam out.nam &
    exit 0
}

# grid


# create nodes
for {set i 0} {$i < $ss} {incr i} {
    set n($i) [$ns node]
}

# create links between them
for {set i 0} {$i < $ss} {incr i} {
    if {[expr $i % $s] != 0} {
        $ns duplex-link $n($i) $n([expr $i - 1]) 1Mb 10ms DropTail
        $ns queue-limit $n($i) $n([expr $i - 1]) 20
        $ns queue-limit $n([expr $i - 1]) $n($i) 20

        if { $failbool == "fail" } {
            if {$i < [expr 0.15 * $ss]} {
```

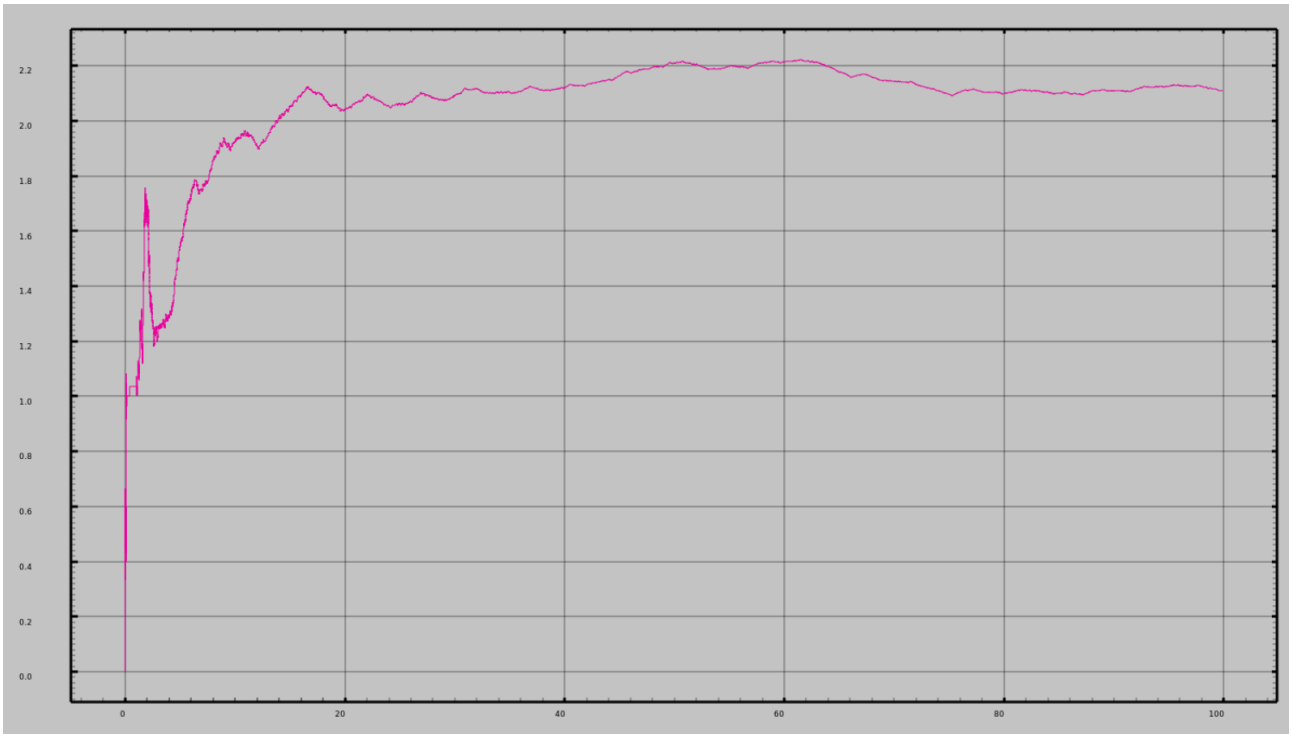
```
                $ns rtmodel-at 30.0 down $n($i) $n([expr $i - 1])
                if {$i < [expr 0.05 * $ss]} {
                    $ns rtmodel-at 60.0 up $n($i) $n([expr $i - 1])
                } else {
                    $ns rtmodel-at 90.0 up $n($i) $n([expr $i - 1])
                }
            }
        }
    }
    if {$i >= $s} {
        $ns duplex-link $n($i) $n([expr $i - $s]) 1Mb 10ms DropTail
        $ns queue-limit $n($i) $n([expr $i - $s]) 20
        $ns queue-limit $n([expr $i - $s]) $n($i) 20
    }
}
set temp [expr $ss - 1 ]

for {set i 0} { $i < [ expr $ss / 2] } {incr i} {
    # setup tcp part
    set tcp($i) [new Agent/TCP]
    set sink($i) [new Agent/TCPSink]
    $ns attach-agent $n($i) $tcp($i)
    $ns attach-agent $n([expr $temp - $i]) $sink($i)
    $ns connect $tcp($i) $sink($i)


    # set packet information
    set ftp($i) [new Application/FTP]
    $ftp($i) attach-agent $tcp($i)
    $ftp($i) set type_ FTP

    # color
    $tcp($i) set fid_ 1

    # # schedule events
    $ns at 1.0 "$ftp($i) start"
    $ns at 99.0 "$ftp($i) stop"
}

$ns at 100.0 "finish"

# run
$ns run
```

<==>

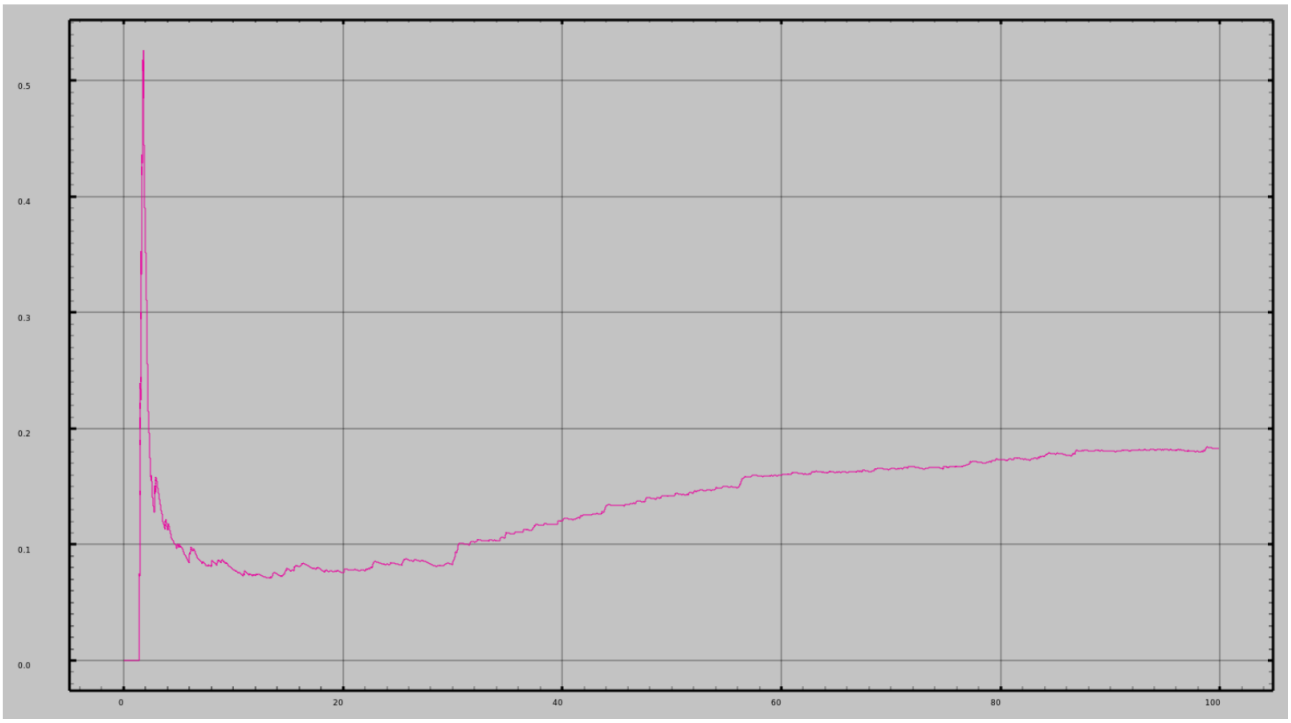
RIP
RIP 16 Nodes with link failure



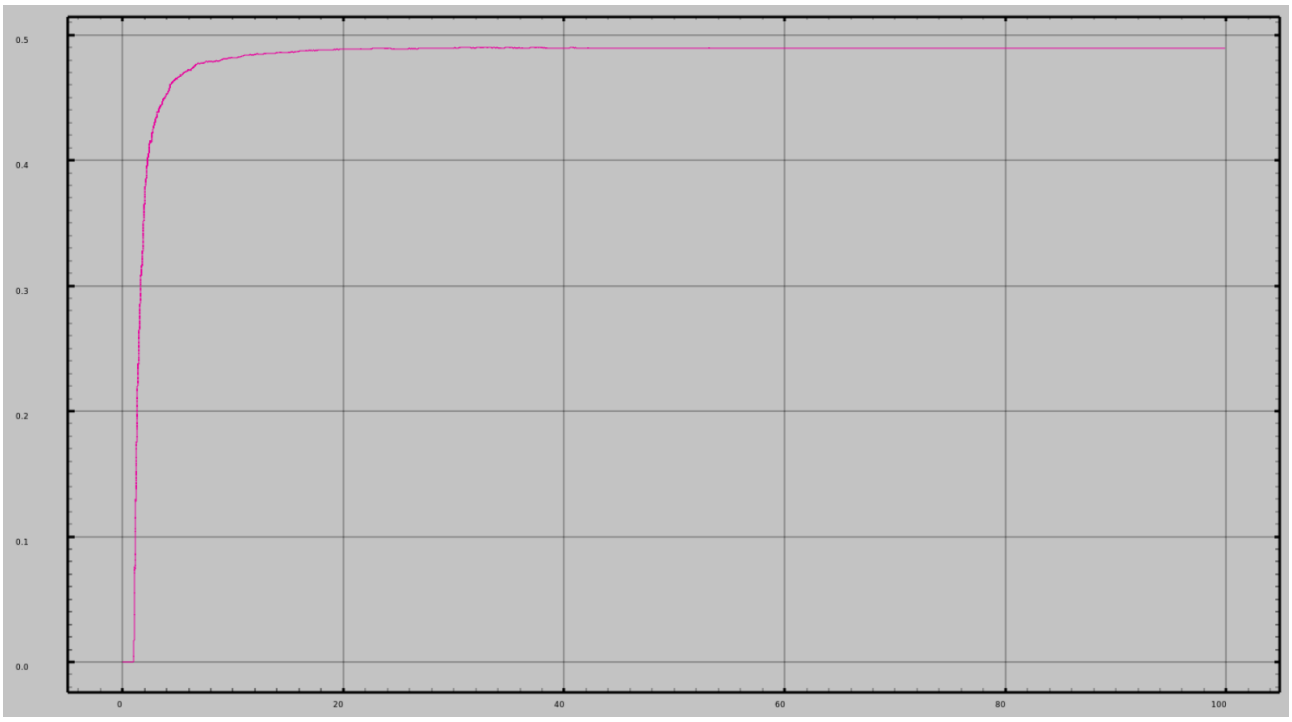
PDR for RIP 16 Nodes with link failure



PLR for RIP 16 Nodes with link failure



CO for RIP 16 Nodes with link failure



<========== DATA TABLES ==========>

Case 1 Table:

Protocol	No of stations (with link failures)											
	16				25				36			
	PDR	PLR	Overhead	Energy	PDR	PLR	Ovehead	Energy	PDR	PLR	Overhead	Energy
RIP	2.108	0.1825	0.48948	4330	1.59096	0.02594	0.4921	6480	2.4753	0.23304	0.4896	9600
OSPF	1.6991	0.161618	0.490531	4300	1.3302	0.03372	0.49265	6300	1.3845	0.2986	0.4822	9600

Case 2 Table:

Protocol	No of stations (without link failures)											
	16				25				36			
	PDR	PLR	Overhead	Energy	PDR	PLR	Overhead	Energy	PDR	PLR	Overhead	Energy
RIP	1.87316	0.0589275	0.493418	4200	1.53887	0.0177018	0.493365	6400	2.5202	0.120213	0.492168	9600
OSPF	1.55608	0.0763997	0.496521	4200	1.09572	0.0158491	0.497129	6400	1.37876	0.209192	0.492363	9600

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