

# TOPOLOGY

- **Two nodes, one link**

```
set ns [new Simulator]
```

```
set nf [open out.nam w]
```

```
$ns namtrace-all $nf
```

```
proc finish {} {  
    global ns nf  
    $ns flush-trace  
    close $nf  
    exec nam out.nam &  
    exit 0  
}
```

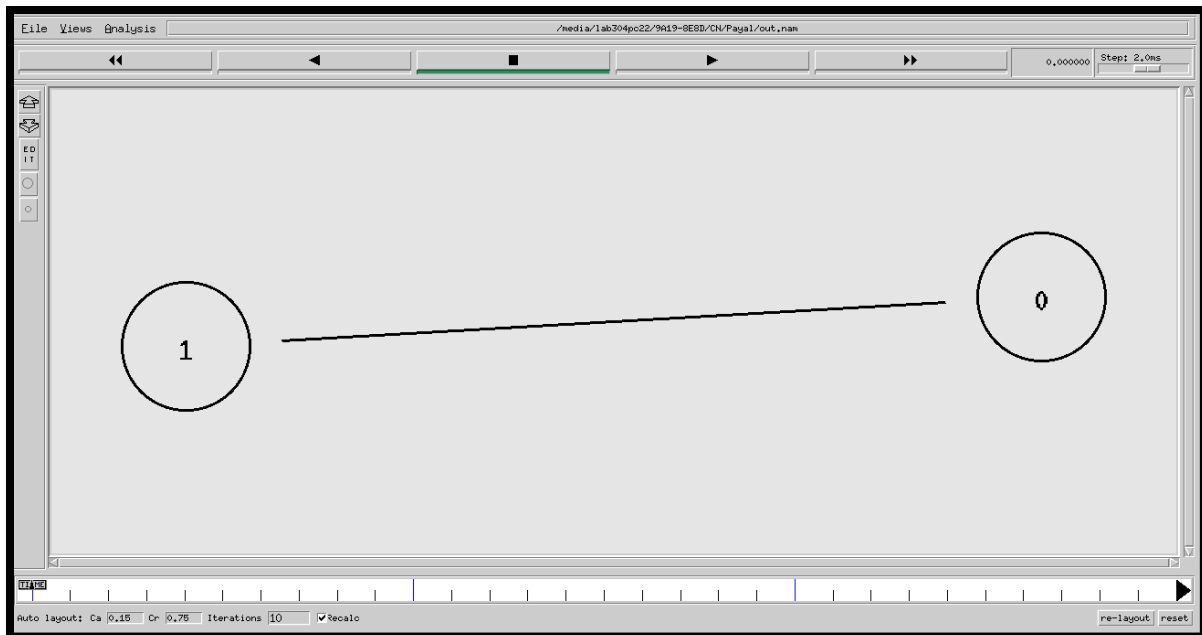
```
set n0 [$ns node]
```

```
set n1 [$ns node]
```

```
$ns duplex-link $n0 $n1 1Mb 10ms DropTail
```

```
$ns at 5.0 "finish"
```

```
$ns run
```



- **Creating a larger topology**

```
set ns [new Simulator]
```

```
set nf [open out.nam w]
```

```
$ns namtrace-all $nf
```

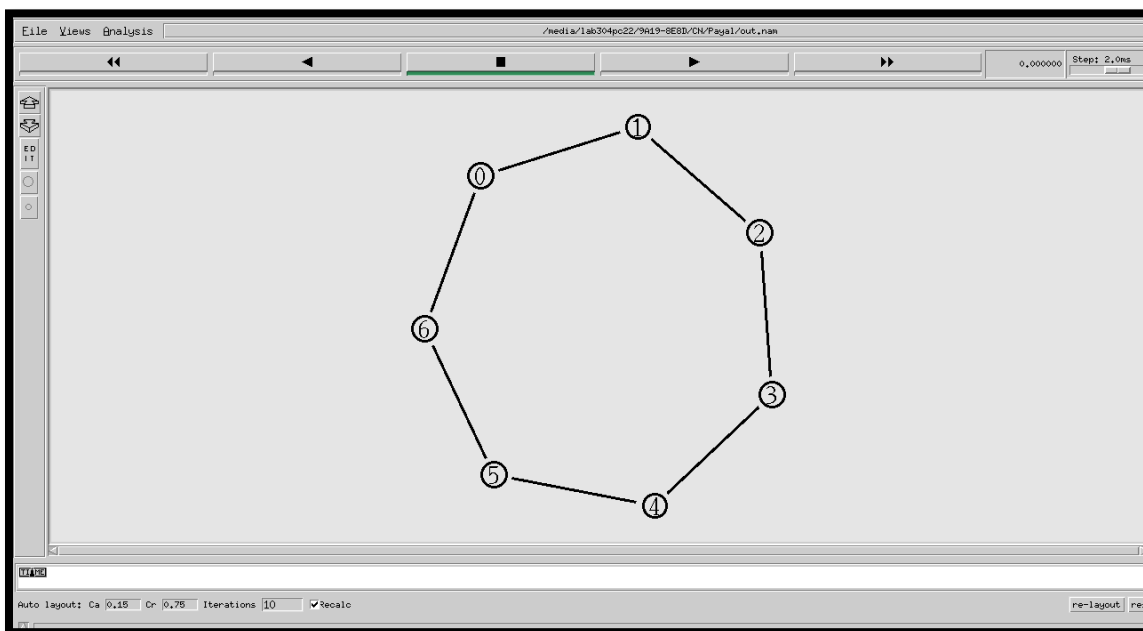
```
proc finish {} {
    global ns nf
    $ns flush-trace
    close $nf
    exec nam out.nam &
    exit 0
}
```

```
for {set i 0} {$i < 7} {incr i} {
    set n($i) [$ns node]
}
```

```
for {set i 0} {$i < 7} {incr i} {
    $ns duplex-link $n($i) $n([expr ($i+1)%7]) 1Mb 10ms DropTail
}
```

```
$ns at 5.0 "finish"
```

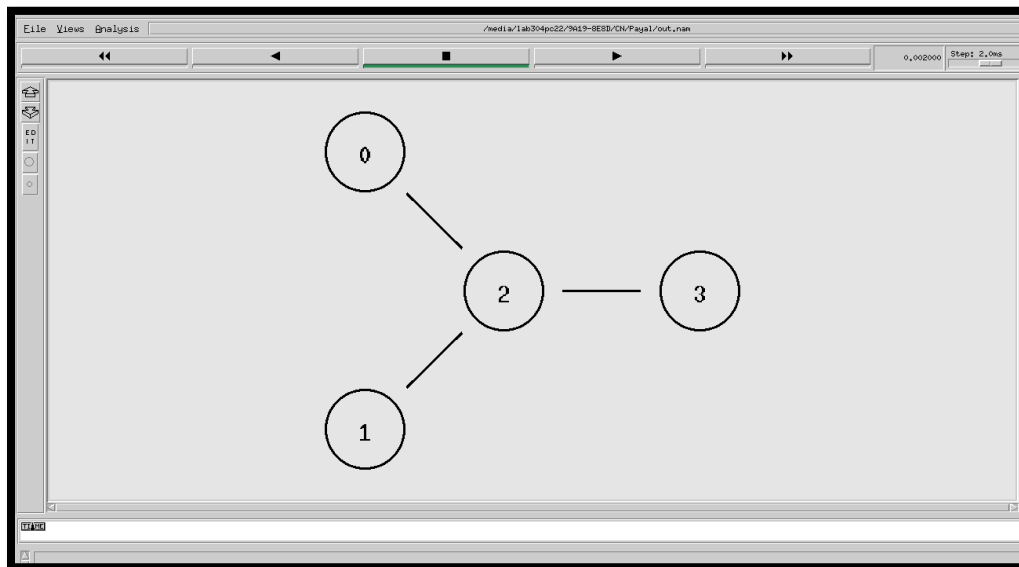
```
$ns run
```



# CBR TRAFFIC FLOW

- **The topology**

```
set ns [new Simulator]
set nf [open out.nam w]
$ns namtrace-all $nf
proc finish {} {
    global ns nf
    $ns flush-trace
    close $nf
    exec nam out.nam &
    exit 0
}
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
$ns duplex-link $n0 $n2 1Mb 10ms DropTail
$ns duplex-link $n1 $n2 1Mb 10ms DropTail
$ns duplex-link $n3 $n2 1Mb 10ms DropTail
$ns duplex-link-op $n0 $n2 orient right-down
$ns duplex-link-op $n1 $n2 orient right-up
$ns duplex-link-op $n2 $n3 orient right
$ns at 5.0 "finish"
$ns run
set ns [new Simulator]
```



- **The events**

```
set nf [open out.nam w]
$ns namtrace-all $nf
```

```
proc finish {} {
    global ns nf
    $ns flush-trace
    close $nf
    exec nam out.nam &
    exit 0
}
```

```
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
```

```
$ns duplex-link $n0 $n2 1Mb 10ms DropTail
$ns duplex-link $n1 $n2 1Mb 10ms DropTail
$ns duplex-link $n3 $n2 1Mb 10ms DropTail
```

```
$ns duplex-link-op $n0 $n2 orient right-down
$ns duplex-link-op $n1 $n2 orient right-up
$ns duplex-link-op $n2 $n3 orient right
```

```
#Create a UDP agent and attach it to node n0
set udp0 [new Agent/UDP]
$ns attach-agent $n0 $udp0
#Create a CBR traffic source and attach it to udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0
#Create a UDP agent and attach it to node n1
set udp1 [new Agent/UDP]
$ns attach-agent $n1 $udp1
#Create a CBR traffic source and attach it to udp1
set cbr1 [new Application/Traffic/CBR]
$cbr1 set packetSize_ 500
$cbr1 set interval_ 0.005
$cbr1 attach-agent $udp1
set null0 [new Agent/Null]
$ns attach-agent $n3 $null0
```

```
$ns connect $udp0 $null0
$ns connect $udp1 $null0
$ns at 0.5 "$cbr0 start"
$ns at 1.0 "$cbr1 start"
$ns at 4.0 "$cbr1 stop"
$ns at 4.5 "$cbr0 stop"
$ns at 5.0 "finish"
$ns run
set ns [new Simulator]
```

- **Marking flows**

```
$ns color 1 Blue
$ns color 2 Red
```

```
set nf [open out.nam w]
$ns namtrace-all $nf
```

```
proc finish {} {
    global ns nf
    $ns flush-trace
    close $nf
    exec nam out.nam &
    exit 0
}
```

```
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
```

```
$ns duplex-link $n0 $n2 1Mb 10ms DropTail
$ns duplex-link $n1 $n2 1Mb 10ms DropTail
$ns duplex-link $n3 $n2 1Mb 10ms DropTail
```

```
$ns duplex-link-op $n0 $n2 orient right-down
$ns duplex-link-op $n1 $n2 orient right-up
$ns duplex-link-op $n2 $n3 orient right
```

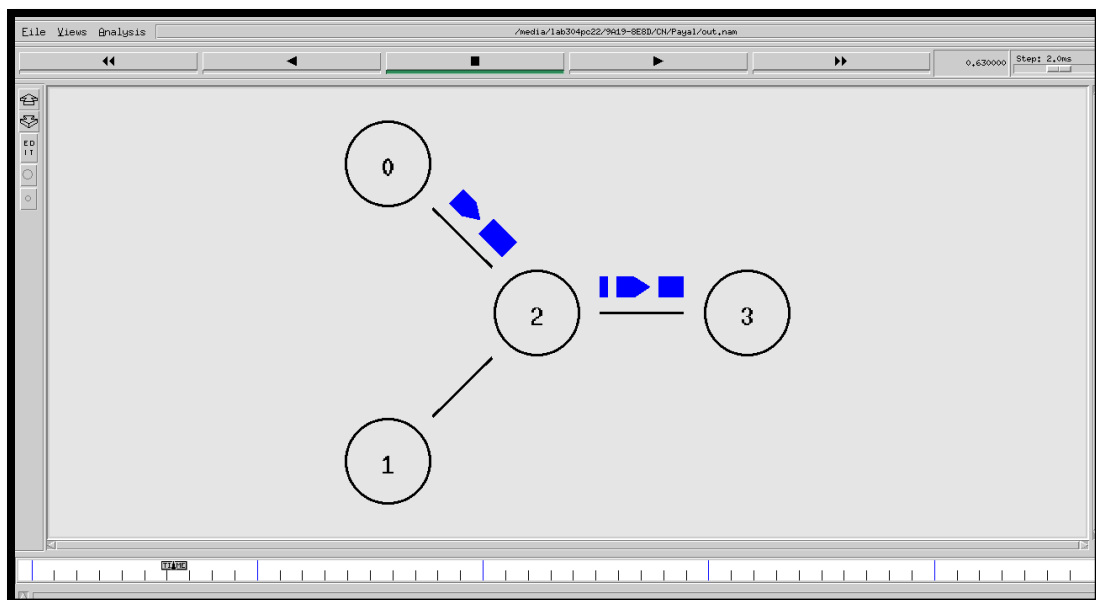
```
#Create a UDP agent and attach it to node n0
set udp0 [new Agent/UDP]
$ns attach-agent $n0 $udp0
$udp0 set class_1
```

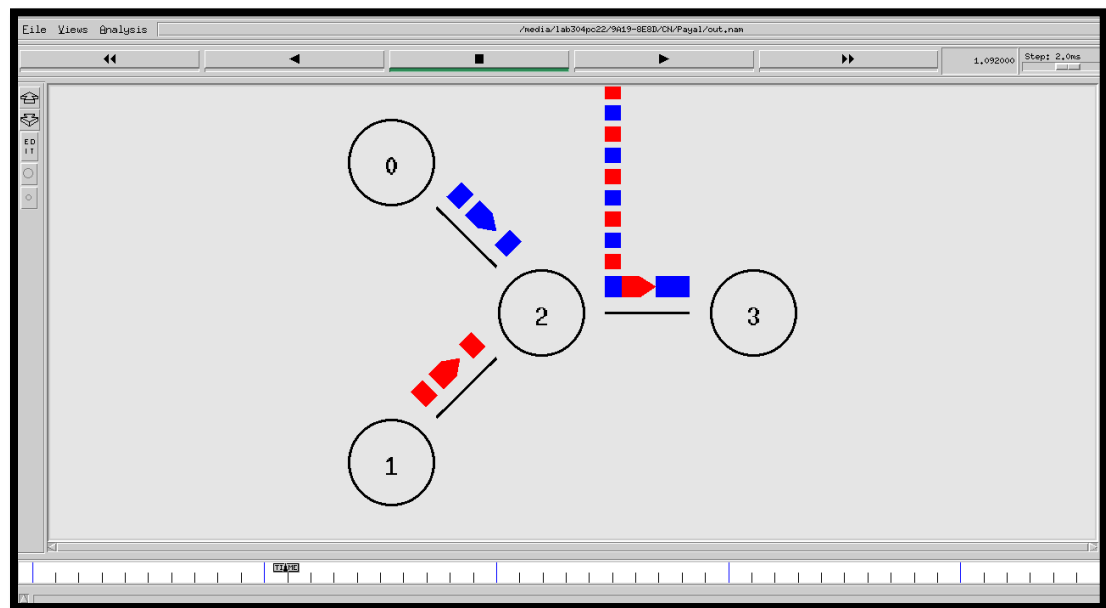
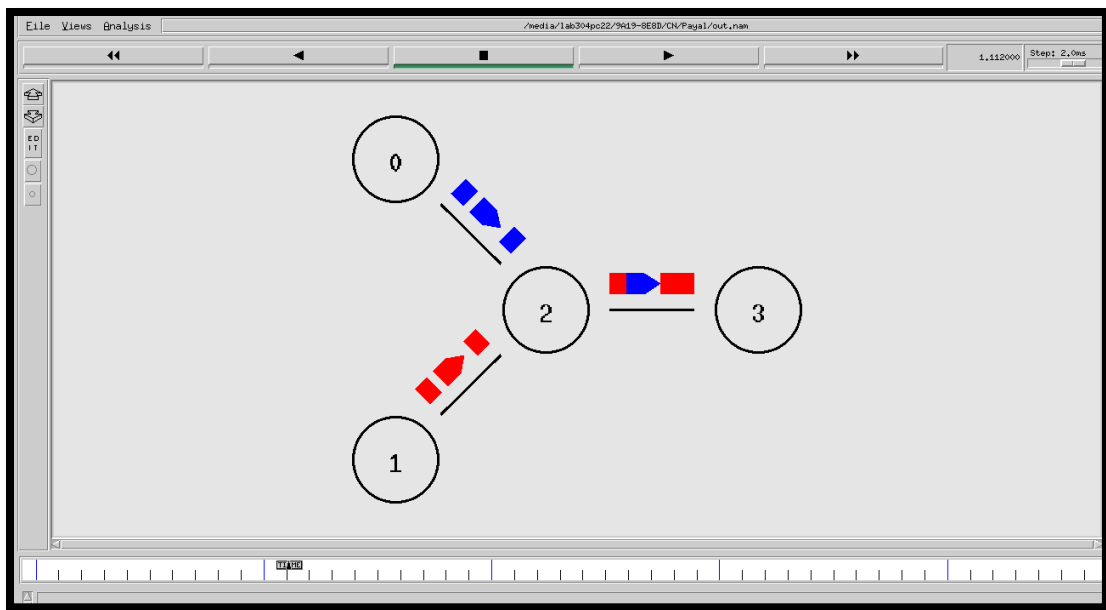
```
#Create a CBR traffic source and attach it to udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0
```

```
#Create a UDP agent and attach it to node n1
set udp1 [new Agent/UDP]
$ns attach-agent $n1 $udp1
$udp1 set class_ 2
```

```
#Create a CBR traffic source and attach it to udp1
set cbr1 [new Application/Traffic/CBR]
$cbr1 set packetSize_ 500
$cbr1 set interval_ 0.005
$cbr1 attach-agent $udp1
```

```
set null0 [new Agent/Null]
$ns attach-agent $n3 $null0
$ns connect $udp0 $null0
$ns connect $udp1 $null0
$ns at 0.5 "$cbr0 start"
$ns at 1.0 "$cbr1 start"
$ns at 4.0 "$cbr1 stop"
$ns at 4.5 "$cbr0 stop"
$ns at 5.0 "finish"
$ns run
```





## LINK FAILURE

```
set ns [new Simulator]
$ns rtproto DV
set nf [open out.nam w]
$ns namtrace-all $nf
proc finish {} {
    global ns nf
    $ns flush-trace
    close $nf
    exec nam out.nam &
    exit 0
}
for {set i 0} {$i < 7} {incr i} {
    set n($i) [$ns node]
}
for {set i 0} {$i < 7} {incr i} {
    $ns duplex-link $n($i) $n([expr ($i+1)%7]) 1Mb 10ms DropTail
}
#Create a UDP agent and attach it to node n0
set udp0 [new Agent/UDP]
$ns attach-agent $n(0) $udp0
#Create a CBR traffic source and attach it to udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0
set null0 [new Agent/Null]
$ns attach-agent $n(3) $null0
$ns connect $udp0 $null0

$ns at 0.5 "$cbr0 start"
$ns at 4.5 "$cbr0 stop"

$ns rtmodel-at 1.0 down $n(1) $n(2)
$ns rtmodel-at 2.0 up $n(1) $n(2)
$ns at 5.0 "finish"
$ns run
```



