

Example Trace with ABP, using my output

```
-bash-3.2$ ./project2 20 0.1 0.1 0.1 1000 -1 1 0 -1
```

```
----- Network Simulator Version 2.3 -----
```

Input parameters:

Number of Messages = 20 Lost Packet Prob. = 0.100

Corrupt Packet Prob. = 0.100 Out Of Order Prob. = 0.100

Ave. time between messages = 1000.00 Trace level = -1

Randomize = 1 Bi-directional = 0

```
SEED: 1480378748
(0 , 0 ) Sending      0      0      !fEVhy->Pbs'2J3m~2DU
(0 , 0 ) Received     0      0      !fEVhy->Pbs'2J3m~2DU
(0 , 0 ) Sending Ack  1      0
(0 , 0 ) Got Ok Ack   1      0
(0 , 0 ) Sending      1      0      ##i.Qt9]!Eh-Ps8[~Dg,
(0 , 0 ) Received     1      0      ##i.Qt9]!Eh-Ps8[~Dg,
(0 , 0 ) Sending Ack  1      1
(0 , 0 ) Got Ok Ack   1      1
(0 , 0 ) Sending      0      0      $X$d:oFzQ(]3h>sJ~U,a
(0 , 0 ) Received     0      0      $X$d:oFzQ(]3h>sJ~U,a
(0 , 0 ) Sending Ack  1      0
(0 , 0 ) Got Ok Ack   1      0
(0 , 0 ) Sending      1      0      %kS$jR:#iQ9!hP8~g07
(0 , 0 ) Received     1      0      %kS$jR:#iQ9!hP8~g07
(0 , 0 ) Sending Ack  1      1
(0 , 0 ) Got Ok Ack   1      1
(0 , 0 ) Sending      0      0      &}wq&e_XRLF?93- '~xr1
(0 , 0 ) Received     0      0      &}wq&e_XRLF?93- '~xr1
(0 , 0 ) Sending Ack  1      0
(0 , 0 ) Got Ok Ack   1      0
(0 , 0 ) Sending      1      0      '2=IT'kv$x:FQ]hs~,7C
(0 , 0 ) Received     1      0      '2=IT'kv$x:FQ]hs~,7C
(0 , 0 ) Sending Ack  1      1
(0 , 0 ) Got Ok Ack   1      1
(0 , 0 ) Sending      0      0      (Eb~=Z(6SpxLi(Eb~=Zw
(0 , 0 ) Received     0      0      (Eb~=Z(6SpxLi(Eb~=Zw
(0 , 0 ) Sending Ack  1      0
(0 , 0 ) Got Ok Ack   1      0
(0 , 0 ) Sending      1      0      dw(V'U&)%S$R2Q!P~O}N
(0 , 0 ) Received     1      0      dw(V'U&)%S$R2Q!P~O}N
(0 , 0 ) Sending Ack  1      1
(0 , 0 ) Got Ok Ack   1      1
(0 , 0 ) Sending      0      0      *jL.nP2r*6vX:z]>~aC%
(0 , 0 ) Received     0      0      *jL.nP2r*6vX:z]>~aC%
(0 , 0 ) Sending Ack  1      0
(0 , 0 ) Got Ok Ack   1      0
(0 , 0 ) Sending      1      0      +fpdWK>2&+k_RF3~~rFY
(0 , 0 ) Received     1      0      +fpdWK>2&+k_RF3~~rFY
(0 , 0 ) Sending Ack  1      1
(0 , 0 ) Got Ok Ack   1      1
(0 , 0 ) Sending      0      0      ,16;AFKPUZ,ejoty~&+0
(1 , 1 ) Corrupt pkt  0      0      Z16;AFKPU,,ejoty~&+0
(1 , 1 ) Nak          -1     0
(1 , 1 ) Got OK Nak   -1     0
(1 , 1 ) Resending    0      0      ,16;AFKPUZ,ejoty~&+0
(1 , 1 ) Received     0      0      ,16;AFKPUZ,ejoty~&+0
```

(1 , 1)	Sending Ack	1	0	
(1 , 1)	Got Ok Ack	1	0	
(1 , 1)	Sending	1	0	-DZq*AWn'=T-\$.Qh~7Ne
(1 , 1)	Received	1	0	-DZq*AWn'=T-\$.Qh~7Ne
(1 , 1)	Sending Ack	1	1	
(1 , 1)	Got Ok Ack	1	1	
(1 , 1)	Sending	0	0	.V~Iq;d.V~Iq.d.V~Iq;
(1 , 1)	Received	0	0	.V~Iq;d.V~Iq.d.V~Iq;
(1 , 1)	Sending Ack	1	0	
(1 , 1)	Got Ok Ack	1	0	
(1 , 1)	Sending	1	0	xiE~Z6pL(b=wSxiE~Z6p
(2 , 2)	Corrupt pkt	90	0	xiE~Z6pL(b=wSxiE~6p
(2 , 2)	Nak	-1	90	
(2 , 2)	Wrong Ack.	-1	90	
(2 , 2)	Resending	1	0	xiE~Z6pL(b=wSxiE~Z6p
1	0	xiE~Z6pL(b=wSxiE~Z6p		
(2 , 2)	Received	1	0	xiE~Z6pL(b=wSxiE~Z6p
(2 , 2)	Sending Ack	1	1	
(3 , 3)	Corrupt Ack/Nak	1	1	◆
(3 , 3)	Resending	1	0	xiE~Z6pL(b=wSxiE~Z6p
Timeout				
(3 , 3)	Resending	1	0	xiE~Z6pL(b=wSxiE~Z6p
(3 , 3)	Wrong Pkt	1	0	xiE~Z6pL(b=wSxiE~Z6p
(3 , 3)	Sending Nak	1	1	
(3 , 3)	Got Ok Ack	1	1	
(3 , 3)	Sending	0	0	d{iVD1 jWE2}2X03~LYG
(3 , 3)	Received	0	0	d{iVD1 jWE2}2X03~LYG
(3 , 3)	Sending Ack	1	0	
(3 , 3)	Got Ok Ack	1	0	
(3 , 3)	Sending	1	0	10x.-,+)('&\$\$#1~} {
(3 , 3)	Received	1	0	10x.-,+)('&\$\$#1~} {
(3 , 3)	Sending Ack	1	1	
(3 , 3)	Got Ok Ack	1	1	
(3 , 3)	Sending	0	0	2CSdt'7HXiy,<M^n21BR
(3 , 3)	Received	0	0	2CSdt'7HXiy,<M^n21BR
(3 , 3)	Sending Ack	1	0	
(4 , 4)	Corrupt Ack/Nak	1	0	◆
(4 , 4)	Resending	0	0	2CSdt'7HXiy,<M^n21BR
(4 , 4)	Wrong Pkt	0	0	2CSdt'7HXiy,<M^n21BR
(4 , 4)	Sending Nak	1	0	
(5 , 5)	Corrupt Ack/Nak	1	0	P
(5 , 5)	Resending	0	0	2CSdt'7HXiy,<M^n21BR
(5 , 5)	Queueing	1	0	3Uw;^!Df*Ln2Tv:]~3e)
(5 , 5)	Queueing	0	0	4f=qGzP&Yxc8lB3K~T4^
(5 , 5)	Queueing	1	0	5zbI0u]D+pW>&kR9~fM5
Timeout				
(5 , 5)	Resending	0	0	2CSdt'7HXiy,<M^n21BR
(5 , 5)	Wrong Pkt	0	0	2CSdt'7HXiy,<M^n21BR
(5 , 5)	Sending Nak	1	0	
(5 , 5)	Got Ok Ack	1	0	
(5 , 5)	Dequeue	1	0	3Uw;^!Df*Ln2Tv:]~3e)
Timeout				
(5 , 5)	Resending	1	0	3Uw;^!Df*Ln2Tv:]~3e)
Timeout				
(5 , 5)	Resending	1	0	3Uw;^!Df*Ln2Tv:]~3e)
(5 , 5)	Received	1	0	3Uw;^!Df*Ln2Tv:]~3e)
(5 , 5)	Sending Ack	1	1	

(5 , 5) Got Ok Ack	1	1	
(5 , 5) Dequeue	0	0	4f=qGzP&Yxc8lB3K~T4^
(5 , 5) Received	0	0	4f=qGzP&Yxc8lB3K~T4^
(5 , 5) Sending Ack	1	0	
(5 , 5) Got Ok Ack	1	0	
(5 , 5) Dequeue	1	0	5zbI0u]D+pW>&kR9~fM5
Timeout			
(5 , 5) Resending	1	0	5zbI0u]D+pW>&kR9~fM5
(5 , 5) Received	1	0	5zbI0u]D+pW>&kR9~fM5
(5 , 5) Sending Ack	1	1	

Simulator terminated at time 79378.161034

after receiving 20 msgs at layer5

Simulator Analysis:

Number of messages sent from 5 to 4: 20
 Number of messages received at Layer 5, side A: 0
 Number of messages received at Layer 5, side B: 20
 Number of messages incorrectly received at layer 5: 0
 Number of packets entering the network: 55
 Average number of packets already in network: 0.000
 Number of packets that the network lost: 6
 Number of packets that the network corrupted: 5
 Number of packets that the network put out of order: 1

Example Trace with ABP, using simulator output

```
-bash-3.2$ ./project2 20 0.1 0.1 0.1 1000 1 1 0 -1
```

```
----- Network Simulator Version 2.3 -----
```

Input parameters:

Number of Messages = 20 Lost Packet Prob. = 0.100
 Corrupt Packet Prob. = 0.100 Out Of Order Prob. = 0.100
 Ave. time between messages = 1000.00 Trace level = 1
 Randomize = 1 Bi-directional = 0

SEED: 1480378595

```

A: 93.6447, Layer 5 to 4 Message = !fEVhy->Pbs'2J3m~2DU
B: 108.1380, Layer 4 to 5 Message = !fEVhy->Pbs'2J3m~2DU
A: 1979.4611, Layer 5 to 4 Message = ##i.Qt9]!Eh-Ps8[~Dg,
B: 1998.5826, Layer 4 to 5 Message = ##i.Qt9]!Eh-Ps8[~Dg,
A: 2667.0762, Layer 5 to 4 Message = $X$d:oFzQ(]3h>sJ~U,a
B: 2696.4503, Layer 4 to 5 Message = $X$d:oFzQ(]3h>sJ~U,a
A: 4577.5655, Layer 5 to 4 Message = %kS%$jR:#iQ9!hP8~gO7
B: 4597.6896, Layer 4 to 5 Message = %kS%$jR:#iQ9!hP8~gO7
A: 5225.5599, Layer 5 to 4 Message = &}wq&e_XRLF?93- '~xr1
B: 5236.1591, Layer 4 to 5 Message = &}wq&e_XRLF?93- '~xr1
  
```

Printing the contents of the Simulation Event Q

Event Time = 5793.655 A: LAYER 5

Event Time = 6225.560 A: Timer

Printing the contents of the Simulation Event Q

A: 5793.6551, Layer 5 to 4 Message = '2=IT'kv\$x:FQ]hs~,7C

Printing the contents of the Simulation Event Q

Event Time = 6736.930 A: LAYER 5

Event Time = 6793.655 A: Timer

B: 5808.4736, Layer 4 to 5 Message = '2=IT'kv\$x:FQ]hs~,7C
A: 6736.9304, Layer 5 to 4 Message = (Eb~=Z(6SpXLi(Eb~=Zw
B: 7751.7576, Layer 4 to 5 Message = (Eb~=Z(6SpXLi(Eb~=Zw
A: 8414.4500, Layer 5 to 4 Message = dW(V'U&)%S\$R2Q!P~O}N
A: 9587.3408, Layer 5 to 4 Message = *jL.nP2r*6vX:z]>~aC%
A: 10362.1968, Layer 5 to 4 Message = +fpdWK>2&+k_RF3~rFY
A: 12340.0328, Layer 5 to 4 Message = ,16;AFKPUZ,ejoty~&+0
B: 13775.2788, Layer 4 to 5 Message = dW(V'U&)%S\$R2Q!P~O}N
B: 13815.8814, Layer 4 to 5 Message = *jL.nP2r*6vX:z]>~aC%
A: 13829.6500, Layer 5 to 4 Message = -DZq*AWn'=T-\$.Qh~7Ne
B: 13841.4330, Layer 4 to 5 Message = +fpdWK>2&+k_RF3~rFY
B: 13854.6590, Layer 4 to 5 Message = ,16;AFKPUZ,ejoty~&+0

Printing the contents of the Simulation Event Q

Event Time = 14511.888 A: LAYER 5

Event Time = 21847.102 A: Timer

Printing the contents of the Simulation Event Q

Event Time = 14511.888 A: LAYER 5

Event Time = 21868.087 A: Timer

B: 13886.1344, Layer 4 to 5 Message = -DZq*AWn'=T-\$.Qh~7Ne
A: 14511.8876, Layer 5 to 4 Message = .V~Iq;d.V~Iq.d.V~Iq;
B: 14516.3728, Layer 4 to 5 Message = .V~Iq;d.V~Iq.d.V~Iq;
A: 15257.6804, Layer 5 to 4 Message = xiE~Z6pL(b=wSxiE~Z6p
B: 15260.2018, Layer 4 to 5 Message = xiE~Z6pL(b=wSxiE~Z6p
A: 16914.6405, Layer 5 to 4 Message = d{iVD1|jWE2}2X03~1YG
B: 16934.8251, Layer 4 to 5 Message = d{iVD1|jWE2}2X03~1YG
A: 18511.8073, Layer 5 to 4 Message = 10x.-,*)('&%\$#1~}|{
B: 18521.0264, Layer 4 to 5 Message = 10x.-,*)('&%\$#1~}|{
A: 19490.9971, Layer 5 to 4 Message = 2CSdt'7HXiy,<M^n21BR
B: 19496.0284, Layer 4 to 5 Message = 2CSdt'7HXiy,<M^n21BR

Printing the contents of the Simulation Event Q

Event Time = 20284.682 A: LAYER 5

Event Time = 27490.997 A: Timer

Printing the contents of the Simulation Event Q

Event Time = 27490.997 A: Timer

A: 20284.6823, Layer 5 to 4 Message = 3Uw;^!Df*Ln2Tv:]~3e)

Printing the contents of the Simulation Event Q

Event Time = 27490.997 A: Timer

A: 20983.2911, Layer 5 to 4 Message = 4f=qGzP&Yxc81B3K~T4^

Printing the contents of the Simulation Event Q

Event Time = 27490.997 A: Timer

A: 22501.8494, Layer 5 to 4 Message = 5zbI0u]D+pW>&kR9~fM5

Printing the contents of the Simulation Event Q

Printing the contents of the Simulation Event Q
Event Time = 43490.997 A: Timer

Printing the contents of the Simulation Event Q
Event Time = 43490.997 A: Timer

Printing the contents of the Simulation Event Q
Event Time = 43519.524 A: Timer

Printing the contents of the Simulation Event Q
Event Time = 43519.524 A: Timer

Printing the contents of the Simulation Event Q
Event Time = 43519.524 A: Timer

B: 27537.3939, Layer 4 to 5 Message = 3Uw;^!Df*Ln2Tv:]~3e)
B: 43565.7542, Layer 4 to 5 Message = 4f=qGzP&Yxc8lB3K~T4^
B: 43584.5298, Layer 4 to 5 Message = 5zbI0u]D+pW>&kR9~fM5

Simulator terminated at time 43586.265968
after receiving 20 msgs at layer5

Simulator Analysis:

Number of messages sent from 5 to 4: 20
Number of messages received at Layer 5, side A: 0
Number of messages received at Layer 5, side B: 20
Number of messages incorrectly received at layer 5: 0
Number of packets entering the network: 55
Average number of packets already in network: 0.000
Number of packets that the network lost: 5
Number of packets that the network corrupted: 4
Number of packets that the network put out of order: 9