

INTERNET OF THINGS

ASSIGNMENT 1



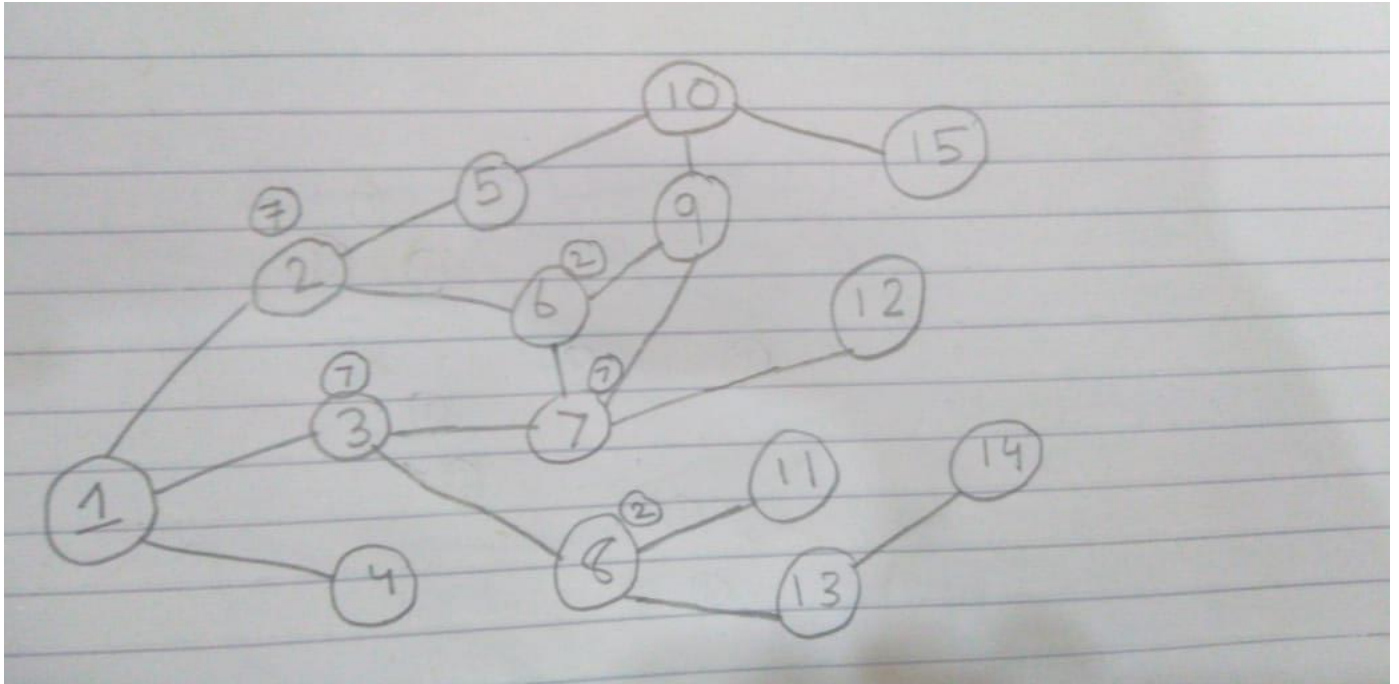
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TOPOLGY



Source Node: 2

Destination Node: 13

Node 1 drops its neighbour randomly to simulate mobility

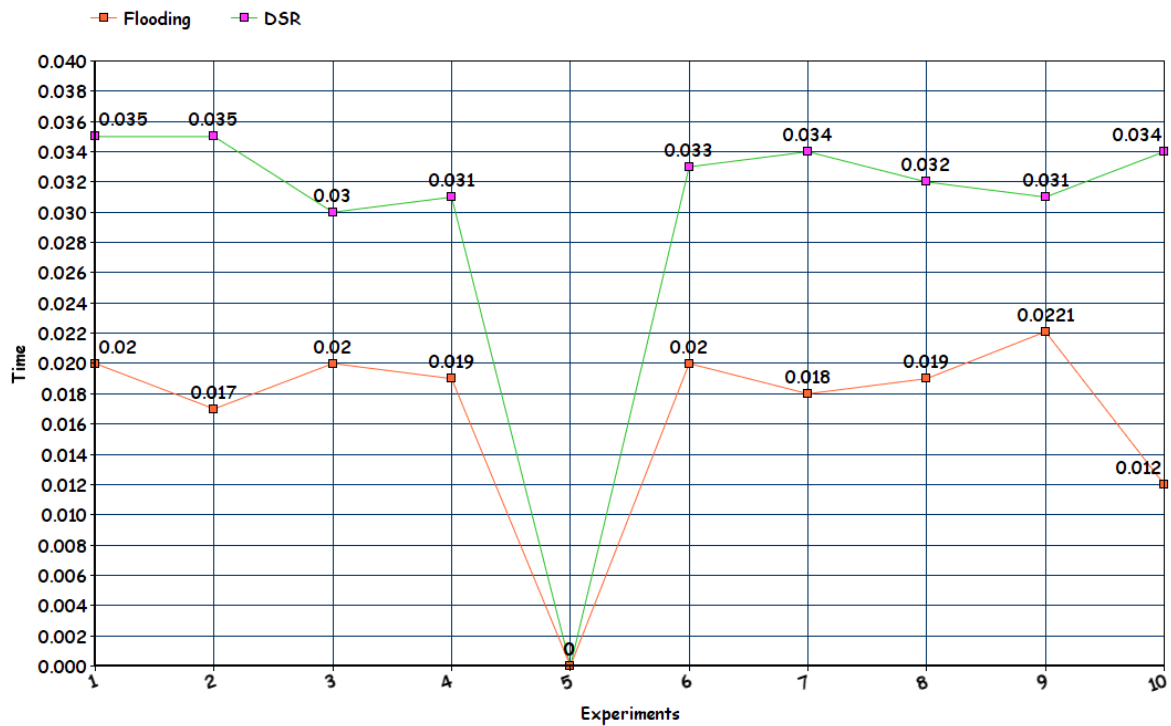
MESSAGE RATE LOW

CASE 1 (Drop Rate 20%)		
Experiments	Flooding	DSR
experiment1	0.02	0.035
Experiment2	0.0169	0.03499
Experiment3	0.0199	0.0309998
Experiment4	0.0189	0.0312643
Experiment5	(Dropped message by 3,7 and 10)	(Dropped message by 3,7 and 10)
Experiment6	0.0201	0.033982
Experiment7	0.01799	0.03499926
Experiment8	0.019	0.0319
Experiment9	0.0221185	0.0319263
Experiment10	0.0189	0.034823

Average Vale:

Flooding: 0.0155

DSR: 0.026



FLOODING

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node2.txt
Socket successfully created
socket binded to 50002
socket is listening
('Adding neighbour', [50001])
1:50005
1:50006
7:20
5:50014
1586957623.76999998892651367188
RREP received!!
RREP received!!
RREP received!!
RREP received!!
RREP received!!
[]

socket is listening
1:50002
1:50003
1:50004
7:20
[]

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node3.txt
Socket successfully created
socket binded to 50003
socket is listening
('Adding neighbour', [50001])
1:50007
1:50008
7:20
[]

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node4.txt
Socket successfully created
socket binded to 50004
socket is listening
('Adding neighbour', [50001])
7:20
[]

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node5.txt
Socket successfully created
socket binded to 50005
socket is listening
('Adding neighbour', [50001])
1:50010
7:20
[]

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node6.txt
Socket successfully created
socket binded to 50006
socket is listening
('Adding neighbour', [50001])
1:50007
1:50009
7:20
[]

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node7.txt
Socket successfully created
socket binded to 50007
socket is listening
('Adding neighbour', [50001])
('Adding neighbour', [50003, 50006])
1:50009
1:50012
7:20
[]
```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
socket bind ed to 50008
('Adding nei ghbour', [50006, 50007])
socket is l istening
('Adding nei ghbour', [50003])
1:50011 visited nei ghbour
1:50013 visited nei ghbour
7:20 visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
PS C:\Users\Hashaam\Desktop\IoT a ssignment 1
> |

t
Socket succe ssfully crea ted
socket binde d to 50011
socket is li stening
('Adding nei ghbour', [50008])
7:20 visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
PS C:\Users\Hashaam\Desktop\IoT a ssignment 1> |

e12.txt
Socket succe ssfully crea ted
socket binde d to 50012
socket is li stening
('Adding nei ghbour', [50007])
7:20 visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
PS C:\Users\Hashaam\Desktop\IoT a ssignment 1> |

Socket succe ssfully crea ted
socket binde d to 50013
socket is li stening
('Adding nei ghbour', [50008])
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
1:50014
7:20
1719
Packet received!!
[50002, 50005, 50010, 50009, 50007, 50003, 50008, 50013]
1586955935.51399993896484375000
Packet received!!
[50002, 50005, 50010, 50009, 50006, 50007, 50003, 50008, 50013]
PS C:\Users\Hashaam\Desktop\IoT assignment 1> python s erver.py node14.txt
Socket successfully created

socket bind ed to 50014
socket is listening
('Adding nei ghbour', [50013])
7:20
1586956092.99099993705749511719
Packet received!!
[50002, 50001, 50003, 50008, 50013]
1586956093.00000000000000000000

essfully cre ated
socket binde d to 50015
socket is l istening
('Adding nei ghbour', [50010])
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
visited nei ghbour
7:20
PS C:\Users\Hashaam\Desktop\IoT a ssignment 1
> |
```

DSR

[illegible]

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
PS C:\Users\Hashaam\Desktop> python server.py node8.txt
Socket successfully created
socket bind ed to 50008

socket is li
stening ('Adding nei
ghbour', [50003])
1:50011
1:50013
7:20
[]

PS C:\Users\Hashaam\Desktop> python server.py node9.txt
Socket succe
ssfully crea
ted
socket binde
d to 50009

socket is li
stening ('Adding nei
ghbour', [50006])
('Adding nei
ghbour', [50006, 50007])
1:50010
7:20
[]

PS C:\Users\Hashaam\Desktop> python server.py node10.txt
Socket succe
ssfully crea
ted
socket binde
d to 50010

socket is li
stening ('Adding nei
ghbour', [50005])
('Adding nei
ghbour', [50005, 50009])
1:50015
7:20
[]

PS C:\Users\Hashaam\Desktop> python server.py node11.txt
Socket succe
ssfully crea
ted
socket binde
d to 50011

socket is li
stening ('Adding nei
ghbour', [50008])
7:20
[]

PS C:\Users\Hashaam\Desktop> python server.py node12.txt
Socket succe
ssfully crea
ted
socket binde
d to 50012

socket is li
stening ('Adding nei
ghbour', [50007])
7:20
[]

PS C:\Users\Hashaam\Desktop> python server.py node13.txt
Socket succe
ssfully crea
ted
socket binde
d to 50013

socket is li
stening ('Adding nei
ghbour', [50008])
1:50014
7:20
[]

PS C:\Users\Hashaam\Desktop> python server.py node14.txt
Socket successfully created
socket bind ed to 50014
socket is listening ('Adding neighbour', [50013])
7:20
RREQ received!!
RREQ received!!
RREQ received!!
RREQ received!!
RREQ received!!
1586957623.8050000665720214844
DSRPACKET received!!
1586957623.806999992179870605469
DSRPACKET received!!
1586957623.80900001525878906250
DSRPACKET received!!
1586957623.81100010871887207031
DSRPACKET received!!
1586957623.81399989128112792969
DSRPACKET received!!
[]

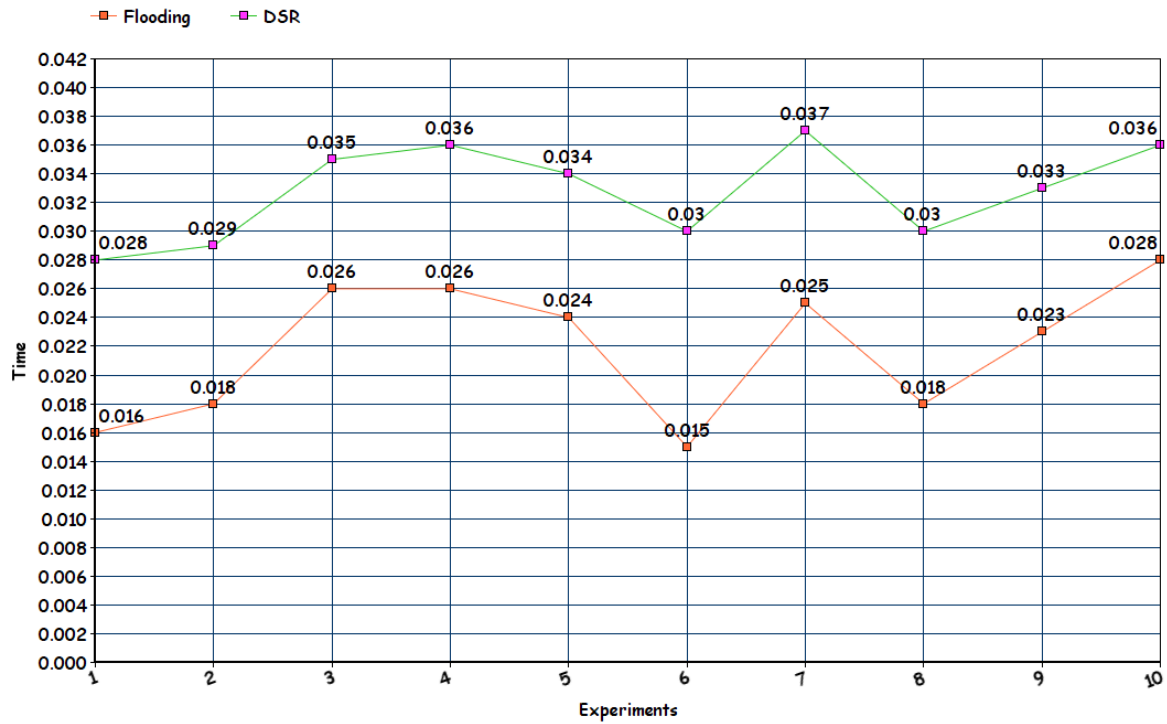
PS C:\Users\Hashaam\Desktop> python server.py node15.txt
Socket successfully created
socket bind ed to 50015
socket is listening ('Adding neighbour', [50010])
7:20
[]
```

CASE 2:		
Experiments	Flooding	DSR
experiment1 (Node 4 dropped)	0.01600003242	0.02799987793
Experiment2 (Node 4 dropped)	0.017834	0.02899984771
Experiment3 (Node 3 dropped)	0.026099	0.03499984741
Experiment4 (Node 1 dropped)	0.026223	0.035871
Experiment5 (Node 3 dropped)	0.024011	0.033999
Experiment6 (Node 4 dropped)	0.0153545	0.030771
Experiment7 (Node 4 dropped)	0.02555	0.0369871
Experiment8 (Node 4 dropped)	0.018222	0.0299841
Experiment9 (Node 3 dropped)	0.02319	0.03294741
Experiment10 (Node 1 dropped)	0.028022	0.03682231

Average Vale:

Flooding: 0.022

DSR: 0.033



The Node doesn't drop the link if only one neighbour left to avoid Partition

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
e1.txt
Socket successfully created
socket binded to 50001

socket is listening
1:50002
1:50003
1:50004
7:20
2:
3:
('My neighbours', [5002, 50003, 50004])
[]

PS C:\Users\Hasham\Desktop\IOT assignment 1
> python server.py node2.txt
Socket successfully created
socket binded to 50002
socket is listening
('Adding neighbour', [50001])
1:50005g neighbour', [50005, 50006, 50001])
1:50006
7:20958361.93600010871887207031
5:50014sers\Hasham\Desktop\IOT assignment 1
>
1586959209.45000004768371582031
RREP received!!
RREP received!!
RREP received!!
RREP received!!
RREP received!!

gnment 1> python server.py node3.txt
Socket successfully created
socket binded to 50003
socket is listening
('Adding neighbour', [50001])
1:50007
1:50008
7:20
[]

thon server.py node4.txt
Socket successfully created

socket binded to 50004
socket is listening
('Adding neighbour', [50001])
Drop function
Can't break connections only 1 left
7:20
[]

gnment 1> python server.py node5.txt
Socket successfully created
socket binded to 50005
socket is listening
('Adding neighbour', [50003, 50006, 50001])
1:50007
1:50008
7:20
[]

e7.txt
Socket successfully created
socket binded to 50007

socket is listening
('Adding neighbour', [50003, 50006, 50001])
('Adding neighbour', [50003, 50006, 50001])
1:50009
1:50012
7:20
[]
```

Flooding

2: powershell, powershell

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
!!Dropped neighbour!!
3:
('My neighbours', [500
02, 50004])
PS C:\Users\Hashaam\De
sktop\IOT assignment 1
> python server.py nod
e1.txt
Socket successfully cr
eated
socket binded to 50001

socket is listening
1:50002
1:50003
1:50004
7:20
3:
('My neighbours', [500
02, 50003, 50004])
2:
!!Dropped neighbour!!
3:
('My neighbours', [500
02, 50004])
visited neighbour
PS C:\Users\Hashaam\De
sktop\IOT assignment 1
> []
```

```
RREP received!!
PS C:\Users\Hashaam\Desktop\IOT assignment 1
> python server.py node2.txt
Socket successfully created
socket binded to 50002
socket is listening
('Adding neighbour', [50001])
1:50005
1:50006
7:20
5:50014
1586960228.48900008201599121094
RREP received!!
RREP received!!
RREP received!!
RREP received!!
PS C:\Users\Hashaam\Desktop\IOT assignment 1
> python server.py node2.txt
Socket successfully created
socket binded to 50002
socket is listening
('Adding neighbour', [50001])
1:50005
1:50006
7:20
4:50014
1586961162.97499990463256835938
PS C:\Users\Hashaam\Desktop\IOT assignment 1
> []
```

```
', [50001])
1:50007
1:50008
7:20
Drop function
PS C:\Users\Hashaam\Desktop\IOT assi
gnment 1> python s
erver.py node3.txt
Socket successfull
y created
socket binded to 5
0003
socket is listenin
g
('Adding neighbour
', [50001])
1:50007
1:50008
7:20
Drop function
visited neighbour
visited neighbour
visited neighbour
visited neighbour
PS C:\Users\Hashaam\Desktop\IOT assi
gnment 1> []
```

```
socket binded to 50004
socket is listening
('Adding neighbour', [50001
])
7:20
PS C:\Users\Hashaam\Desktop
\IOT assignment 1> python s
erver.py node4.txt
Socket successfully created

socket binded to 50004
socket is listening
('Adding neighbour', [50001
])
7:20
visited neighbour
PS C:\Users\Hashaam\Desktop
\IOT assignment 1> []
```

```
thon server.
py node5.txt
Socket succe
ssfully crea
ted
socket binde
d to 50006
socket is li
stening
('Adding nei
ghbour', [50
002])
1:50009
1:50007
1:50009
7:20
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> []
```

```
socket succe
ssfully crea
ted
socket binde
d to 50008

socket is l
istening
('Adding ne
ighbour', [
50003])
1:50011
1:50013
7:20
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
PS C:\Users\
Hashaam\De
sktop\IOT a
ssignment 1
> python se
rver.py nod
e8.txt[]
```

```
Socket succe
ssfully crea
ted
socket binde
d to 50009
socket is li
stening
('Adding nei
ghbour', [50
006])
('Adding nei
ghbour', [50
006, 50007])
1:50010
7:20
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> py
thon server.
py node9.txt
[]
```

```
Socket succe
ssfully crea
ted
socket binde
d to 50010
socket is li
stening
('Adding nei
ghbour', [50
005])
('Adding nei
ghbour', [50
005, 50009])
1:50015
7:20
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> py
thon server.
py node10.tx
t[]
```

```
thon server.
py node11.tx
t
Socket succe
ssfully crea
ted
socket binde
d to 50011
socket is li
stening
('Adding nei
ghbour', [50
008])
7:20
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> py
thon server.
py node11.tx
t[]
```

```
top\IOT assi
gnment 1> py
thon server.
py node13.tx
t
Socket succe
ssfully crea
ted
socket binde
d to 50012
socket is li
stening
('Adding nei
ghbour', [50
007])
('Adding nei
ghbour', [50
008])
1:50014
7:20
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> []
```

```
PS C:\Users\Hashaam\Desktop\IOT assignment 1>
python server.py node14.txt
Socket successfully created
socket binded to 50014
socket is listening
('Adding neighbour', [50013])
7:20
1586961162.99099993705749511719
Packet received!!
[50002, 50006, 50007, 50003, 50008, 50013]
1586961163.00799989708317382812
Packet received!!
[50002, 50006, 50009, 50007, 50003, 50008, 500
13]
1586961163.00900006294250488281
Packet received!!
[50002, 50005, 50010, 50009, 50007, 50003, 500
08, 50013]
1586961163.00999999046325683594
Packet received!!
[50002, 50005, 50010, 50009, 50006, 50007, 500
03, 50008, 50013]
PS C:\Users\Hashaam\Desktop\IOT assignment 1>
[]
```

```
e15.txt
Socket succehbour', [500
ssfully created
socket binded to 50015
socket is listening
('Adding neighbour', [500
10])
C:\Users\Hashaam\Desk
top\IOT assi
gnment 1> pyth
on server.py node15.txt
Socket successfully creat
ed
socket binded to 50015
socket is listening
('Adding neighbour', [500
10])
7:20
visited neighbour
visited neighbour
visited neighbour
PS C:\Users\Hashaam\Desk
top\IOT assignment 1> []
```


DSR

PROBLEMS

OUTPUT

DEBUG CONSOLE

TERMINAL

2: powershell, powershell

> python server.py node1.txt
Socket successfully created
socket binded to 50001

socket is listening
1:50002
1:50003
1:50004
7:20
3:
(['My neighbours', [50002, 50003, 50004]])
2:
!!Dropped neighbour!!
3:
(['My neighbours', [50002, 50004]])
PS C:\Users\Hashaam\Desktop\IOT assignment 1
>

RREP received!!
RREP received!!
RREP received!!
RREP received!!
PS C:\Users\Hashaam\Desktop\IOT assignment 1
> python server.py node2.txt
Socket successfully created
socket binded to 50002
socket is listening
(['Adding neighbour', [50001]])
1:50005
1:50006
7:20
5:50014
1586960228.48900008201599121094
RREP received!!
RREP received!!
RREP received!!
PS C:\Users\Hashaam\Desktop\IOT assignment 1
>

7:20
Drop function
PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node3.txt

Socket successfully created
socket binded to 50003
socket is listening
(['Adding neighbour', [50001]])
1:50007
1:50008
7:20
Drop function
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node4.txt
Socket successfully created

socket binded to 50004
socket is listening
(['Adding neighbour', [50001]])
7:20
PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node5.txt
Socket successfully created
socket binded to 50005
socket is listening
(['Adding neighbour', [50002]])
1:50010
7:20
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

Hashaam\Desktop\IOT assignment 1> python server.py node6.txt
Socket successfully created
socket binded to 50006
socket is listening
(['Adding neighbour', [50003]])
1:50007
1:50009
7:20
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

top\IOT assignment 1> python server.py node7.txt
Socket successfully created
socket binded to 50007
socket is listening
(['Adding neighbour', [50003]])
(['Adding neighbour', [50003, 50006]])
1:50009
1:50012
7:20
PS C:\Users\Hashaam\Desktop\IOT assignment 1
>

Activate Windows
Go to Settings to activate Windows.

1: powershell, powershell

ssignment 1
>

top\IOT assignment 1>

top\IOT assignment 1>

top\IOT assignment 1>

top\IOT assignment 1>

top\IOT assignment 1>

1586960228.52399992942810058594
DSRPACKET received!!
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

PS C:\Users\Hashaam\Desktop\IOT assignment 1>

PS C:\Users\Hashaam\Desktop\IOT assignment 1>

> python server.py node8.txt
Socket successfully created
socket binded to 50015
socket is listening
(['Adding neighbour', [50010]])
Socket successfully created
C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node9.txt
Socket successfully created
socket binded to 50015
socket is listening
(['Adding neighbour', [50010]])
7:20
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

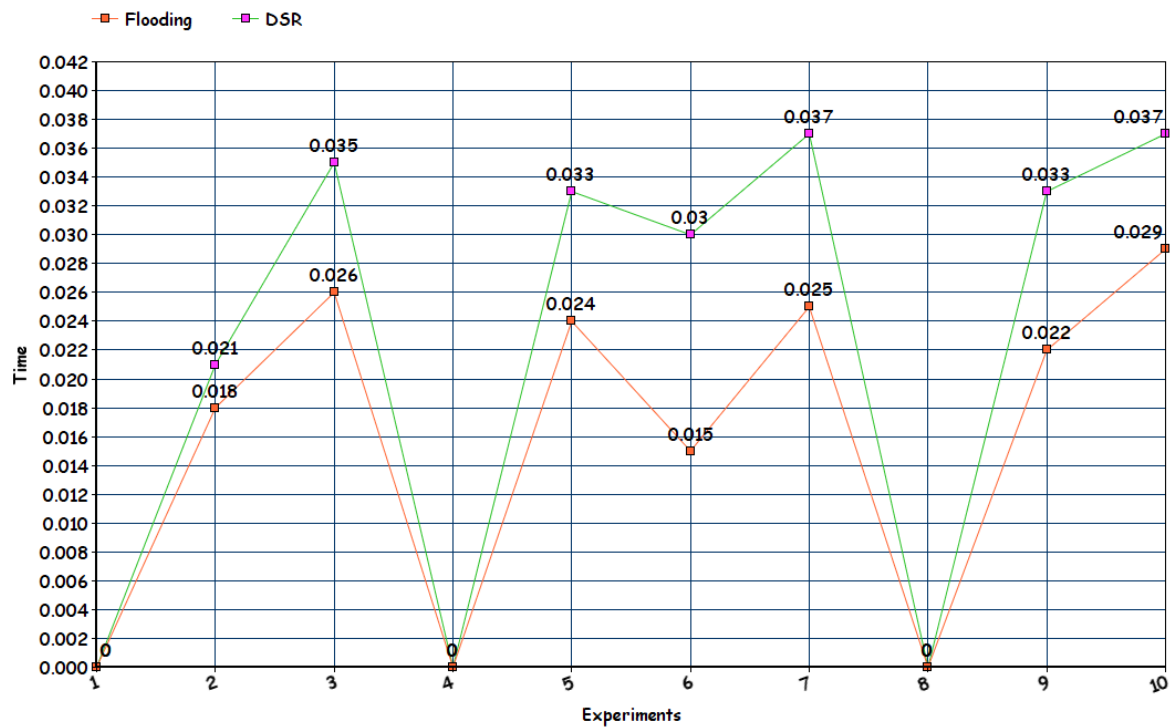
Activate Windows
Go to Settings to activate Windows.

CASE 3 (Drop Rate 60%)		
Experiments	Flooding	DSR
experiment1 (Node 3 dropped)	(Dropped message by 8 and 6)	(Dropped message by 8 and 6)
Experiment2 (Node 4 dropped)	0.01799	0.0212247
Experiment3 (Node 3 dropped)	0.026559	0.034947
Experiment4 (Node 1 dropped)	(Dropped message by 3 and 7)	(Dropped message by 3 and 7)
Experiment5 (Node 3 dropped)	0.024022	0.033545
Experiment6 (Node 4 dropped)	0.01545	0.0307722
Experiment7 (Node 3 dropped)	0.025151	0.0369991
Experiment8 (Node 4 dropped)	(Dropped message by 9,15,7 and 1)	(Dropped message by 9,15,7 and 1)
Experiment9 (Node 3 dropped)	0.022239	0.032943
Experiment10 (Node 1 dropped)	0.028772	0.0368731

Average Vale:

Flooding: 0.016

DSR: 0.027



Message was dropped and couldn't get to its destination

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
eated
socket bind
ed to 50008

socket is l
istening
('Adding ne
ighbour', [
50003]), [
1:50011
1:50013
7:60
PS C:\Users\
Hashaam\Des
ktop\IOT a
ssignment 1
> []
```

```
d to 50009
socket is li
stening
('Adding nei
ghbour', [50
006])
('Adding nei
ghbour', [50
006, 50007])

1:50010
7:60
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> []
```

```
d to 50010
socket is li
stening
('Adding nei
ghbour', [50
005])
('Adding nei
ghbour', [50
005, 50009])

1:50015
7:60
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> []
```

```
1.txt
Socket succe
ssfully crea
ted
socket binde
d to 50011
socket is li
stening
('Adding nei
ghbour', [50
008])



7:60
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> []
```

```
2.txt
Socket succe
ssfully crea
ted
socket binde
d to 50012
socket is li
stening
('Adding nei
ghbour', [50
007])

7:60
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> []
```

```
Socket succe
ssfully crea
ted
socket binde
d to 50013
socket is li
stening
('Adding nei
ghbour', [50
008])
1:50014
7:60
PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> []
```

```
> python server.py node15
rver.py nod
e15.txt essfully creat
ed
socket successsfully creat
ed
socket binded to 50015
socket is listening
('Adding neighbour', [500
10])
7:60
PS C:\Users\Hashaam\Desktop\IOT assignment 1> []
```

1: powershell, powershell +   ^ x

Activate Windows
Go to Settings to activate Windows.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
1:50003 1586062220.61899995803833007812 Socket successful
1:50004 PS C:\Users\Hashaam\Desktop\IOT assignment 1 y created
7:60 > python server.py node2.txt socket binded to 50003
3: Socket successfully created socket is listenin
('My neighbours', [50002, 50003, 50004]) socket binded to 50002 g
2: socket is listening ('Adding neighbour', [50001])
!!Dropped neighbour!! 1:50005
3: 1:50006
('My neighbours', [50002, 50004]) 7:60
!!Drop Message!! 4:50014
[] 1586962419.96700000762939453125 Drop function
[] PS C:\Users\Hashaam\Desktop\IOT assignment 1> []

7:60 Socket successfully created
visited neighbour PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node4.txt
socket binded to 50004 socket is listening
('Adding neighbour', [50001])
7:60
PS C:\Users\Hashaam\Desktop\IOT assignment 1> []

ted socket binded to 50005 socket is listening
('Adding neighbour', [50002])
1:50010
7:60
!!Drop Message!!
PS C:\Users\Hashaam\Desktop\IOT assignment 1> []

socket binded to 50006 socket is listening
('Adding neighbour', [50002])
1:50007
7:60
!!Drop Message!!
[]

socket is listening
('Adding neighbour', [50003])
1:50009
1:50012
7:90
[]

Activate Windows
Go to Settings to activate Windows.
```

Only One Packet got through till destination

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
> python server.py nod
e1.txt
Socket successfully cr
eated
socket binded to 50001

socket is listening
1:50002
1:50003
1:50004
7:60
visited neighbour
visited neighbour
3:
('My neighbours', [500
02, 50003, 50004])
2:
!!Dropped neighbour!!
3:
('My neighbours', [500
02, 50004])
visited neighbour

PS C:\Users\Hashaan\Desktop>.IOT assignment 1
> python server.py node2.txt
Socket successfully created
socket binded to 50002
socket is listening
('Adding neighbour', [50001])
1:50005
1:50006
7:60
visited neighbour
visited neighbour
4:50014
1586964217.65400004386901855469
[]

1:50007
1:50008
7:60
visited neighbour
1586964195.5199999
8092651367188
Packet received!!
[50015, 50010, 500
09, 50007]
1586964195.5199999
8092651367188
Packet received!!
[50015, 50010, 500
05, 50002, 50001]
1586964195.5199999
8092651367188
Packet received!!
[50015, 50010, 500
05, 50002, 50006,
50009, 50007]
Drop function
visited neighbour

PS C:\Users\Hashaan\Desktop>.IOT assignment 1> python s
erver.py node4.txt
Socket successfully created

socket binded to 50004
socket is listening
('Adding neighbour', [50001
])
7:60
4:50010
1586964188.4730000495910644
5312
visited neighbour
!!Drop Message!!
[]

Socket succe
ssfully crea
ted
socket binde
d to 50005
socket is li
stening
('Adding nei
ghbour', [50
002])
visited neig
hbour
1:50007
1:50009
7:60
visited neig
hbour
!Drop Messa
ge!!
visited neig
hbour
!Drop Messa
ge!!
visited neig
hbour
!Drop Mess
age!!

Go to Settings to activate Windows.
```

```

assignment 1
> python server.py node8.txt
Socket successfully created
socket bind
ed to 50008

socket is l
istening
('Adding ne
ighbour', [
50003])
visited nei
ghbour
1:50011
1:50013
7:60
visited nei
ghbour
[]

ghbour', [50
006])
('Adding nei
ghbour', [50
006, 50007])
1:50010
7:60
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
!!Drop Messa
ge!!
visited nei
ghbour
visited nei
ghbour
[]

ted
socket binde
d to 50010
socket is li
stening
('Adding nei
ghbour', [50
005])
('Adding nei
ghbour', [50
005, 50009])
1:50015
7:60
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
!!Drop Messa
ge!!
[]

PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> py
thon server.
py node11.tx
t
Socket succe
ssfully crea
ted
socket binde
d to 50012
socket is li
stening
('Adding nei
ghbour', [50
008])
7:60
visited nei
ghbour
[]

top\IOT assi
gnment 1> py
thon server.
py node12.tx
t
Socket succe
ssfully crea
ted
socket binde
d to 50012
socket is li
stening
('Adding nei
ghbour', [50
007])
7:60
visited nei
ghbour
visited nei
ghbour
visited nei
ghbour
[]

PS C:\Users\
Hashaam\Desk
top\IOT assi
gnment 1> py
thon server.
py node13.tx
t
Socket succe
ssfully crea
ted
socket binde
d to 50013
socket is li
stening
('Adding nei
ghbour', [50
008])
1:50014
7:60
visited nei
ghbour
[]

PS C:\Users\Washaam\Desktop\IOT assignment 1>
python server.py node14.txt
Socket successfully created
socket binded to 50014
socket is listening
('Adding neighbour', [50013])
7:60
1586964217.6710000381469726562
Packet received!!
[50002, 50006, 50007, 50003, 50008, 50013]
[]

PS C:\Users\Washaam\Deskt
op\IOT assignment 1> pyth
on server.py node15.txt
Socket successfully creat
ed
socket binded to 50015
socket is listening
('Adding neighbour', [500
10])
7:60
4:50003
1586964195.519999998092651
367188
visited neighbour
visited neighbour
[]

```

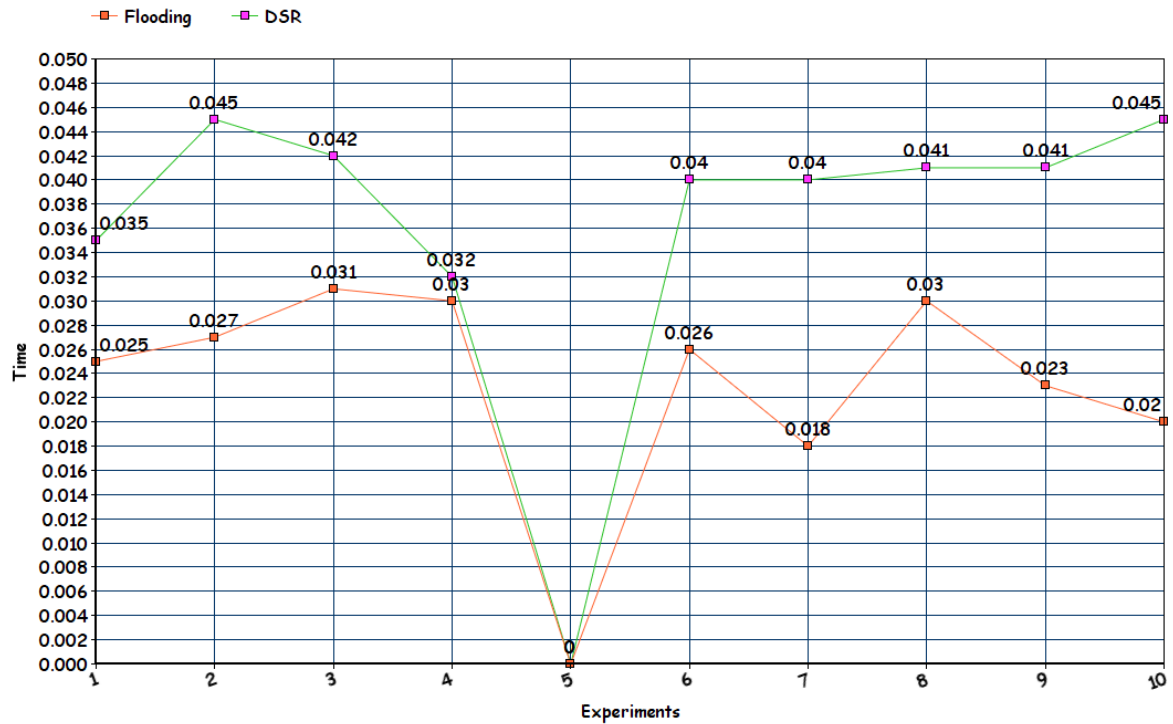
MESSAGE RATE HIGH

CASE 1 (Drop Rate 20%)		
Experiments	Flooding	DSR
experiment1	0.0255	0.03555
Experiment2	0.0268	0.04489
Experiment3	0.0309	0.0419
Experiment4	0.0299	0.0323643
Experiment5	(Dropped message by 3 and 10)	(Dropped message by 3 and 10)
Experiment6	0.0256	0.039482
Experiment7	0.01854	0.0404
Experiment8	0.0290	0.0418
Experiment9	0.0231	0.0418
Experiment10	0.02009	0.0458

Average Vale:

Flooding: 0.047

DSR: 0.036

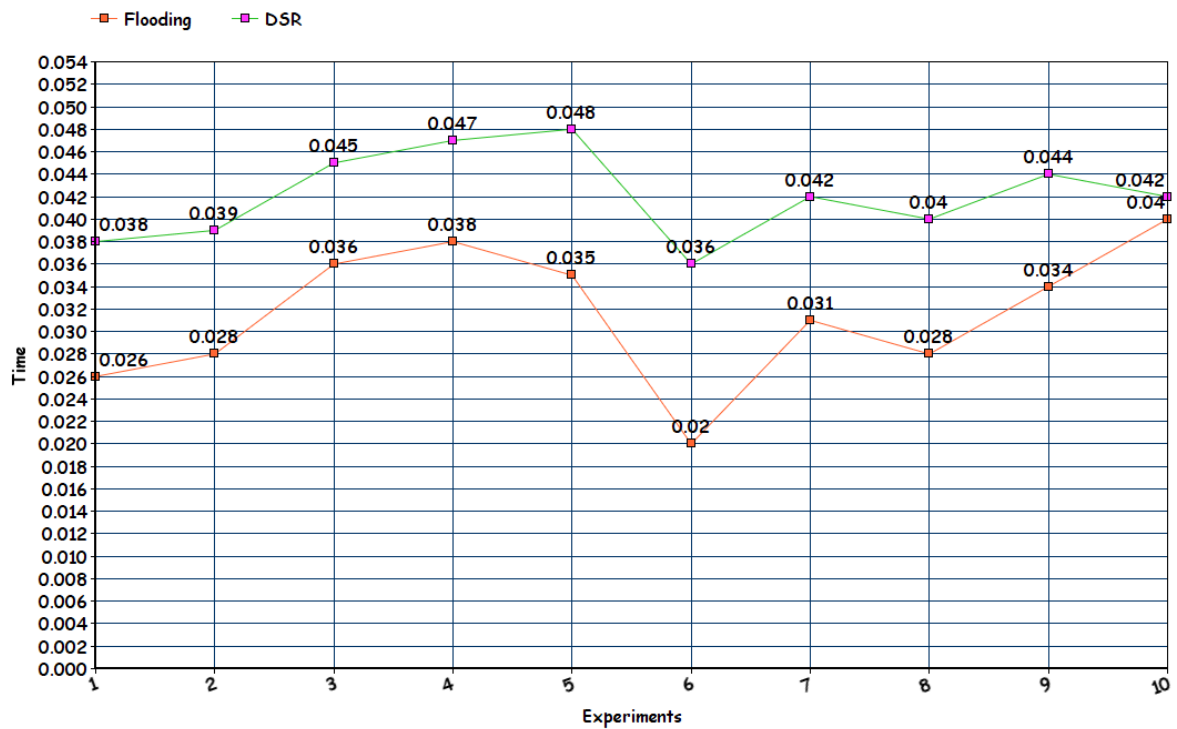


CASE 2:		
Experiments	Flooding	DSR
experiment1 (Node 4 dropped)	0.0259	0.0378
Experiment2 (Node 4 dropped)	0.0277	0.0388
Experiment3 (Node 3 dropped)	0.0359	0.0448
Experiment4 (Node 1 dropped)	0.0372	0.0468
Experiment5 (Node 3 dropped)	0.0350	0.0449
Experiment6 (Node 4 dropped)	0.0208	0.0362
Experiment7 (Node 4 dropped)	0.0310	0.0423
Experiment8 (Node 4 dropped)	0.0281	0.0398
Experiment9 (Node 3 dropped)	0.0341	0.0439
Experiment10 (Node 1 dropped)	0.0390	0.0423

Average Vale:

Flooding: 0.0315

DSR: 0.042



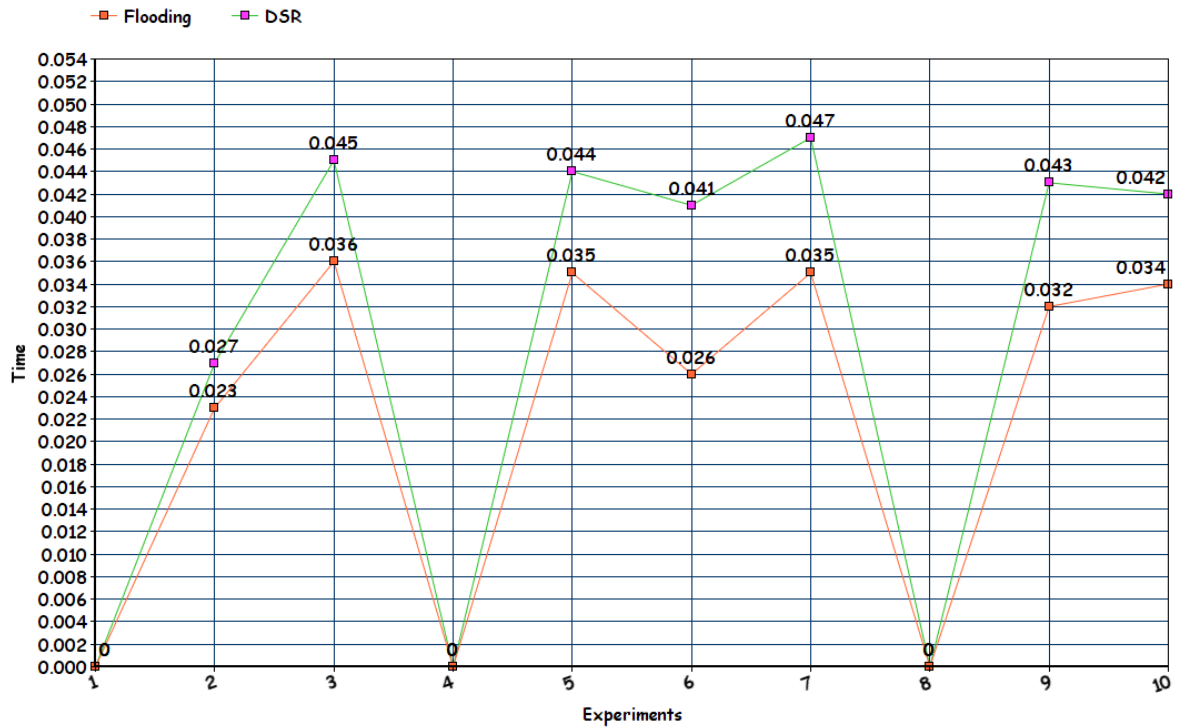
CASE 3 (Drop Rate 60%)		
Experiments	Flooding	DSR
experiment1 (Node 3 dropped)	(Dropped message by 8 and 6)	(Dropped message by 8 and 6)
Experiment2 (Node 4 dropped)	0.0234	0.0267
Experiment3 (Node 3 dropped)	0.0364	0.0448
Experiment4 (Node 1 dropped)	(Dropped message by 3 and 7)	(Dropped message by 3 and 7)
Experiment5 (Node 3 dropped)	0.0350	0.0445
Experiment6 (Node 4 dropped)	0.0264	0.0417
Experiment7 (Node 3 dropped)	0.0350	0.0468
Experiment8 (Node 4 dropped)	(Dropped message by 9,15,7 and 1)	(Dropped message by 9,15,7 and 1)
Experiment9 (Node 3 dropped)	0.0321	0.0428
Experiment10 (Node 1 dropped)	0.0342	0.0423

CASE 3:

Average Vale:

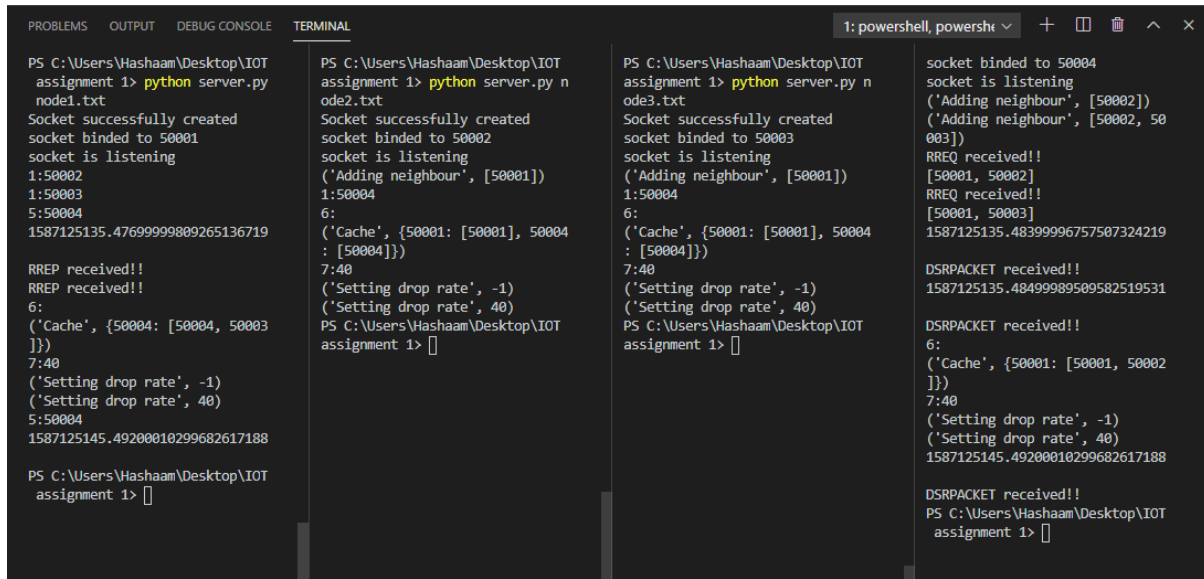
Flooding: 0.022

DSR: 0.029



CACHE IN DSR (BONUS)

We have added the cache in DSR, the cache saves the source and destination path both for all the nodes in between and if the message is sent again it uses cache to deliver the DSR packet without sending the RREQ and RREP.



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: powershell, powershell x

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node1.txt
Socket successfully created
socket binded to 50001
socket is listening
1:50002
1:50003
5:50004
1587125135.47699999809265136719

RREP received!!
RREP received!!
6:
({'Cache', {50004: [50004, 50003]}})
7:40
('Setting drop rate', -1)
('Setting drop rate', 40)
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node2.txt
Socket successfully created
socket binded to 50002
socket is listening
('Adding neighbour', [50001])
1:50004
6:
({'Cache', {50001: [50001], 50004 : [50004]}})
7:40
('Setting drop rate', -1)
('Setting drop rate', 40)
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

PS C:\Users\Hashaam\Desktop\IOT assignment 1> python server.py node3.txt
Socket successfully created
socket binded to 50003
socket is listening
('Adding neighbour', [50001])
1:50004
6:
({'Cache', {50001: [50001], 50004 : [50004]}})
7:40
('Setting drop rate', -1)
('Setting drop rate', 40)
PS C:\Users\Hashaam\Desktop\IOT assignment 1>

socket binded to 50004
socket is listening
('Adding neighbour', [50002], [50003])
RREQ received!!
[50001, 50002]
RREQ received!!
[50001, 50003]
1587125135.48399996757507324219

DSRPACKET received!!
1587125135.48499989509582519531

DSRPACKET received!!
6:
({'Cache', {50001: [50001, 50002]}})
7:40
('Setting drop rate', -1)
('Setting drop rate', 40)
1587125145.49200010299682617188

DSRPACKET received!!
PS C:\Users\Hashaam\Desktop\IOT assignment 1>
```