

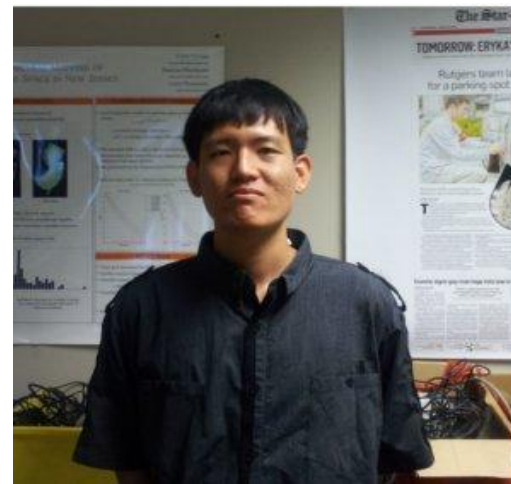
Extending GSTAR to support Multicast and Inter-Domain Routing



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Long Term Goals

- Understanding Generalized Storage Aware Routing (GSTAR) protocol
- Implementing multicasting in intra-domain using the Global Name Resolution Service (GNRS)
- Extending GSTAR to support inter-domain routing

Simulating GSTAR over Sample Topology

Attributes

- AP: .1 Beacon Generation
- Station: Reassociates with AP after 2 missed beacons.
- CSMA: 1Mbps with .56 ms delay

- 50 Seconds Simulation

Movement

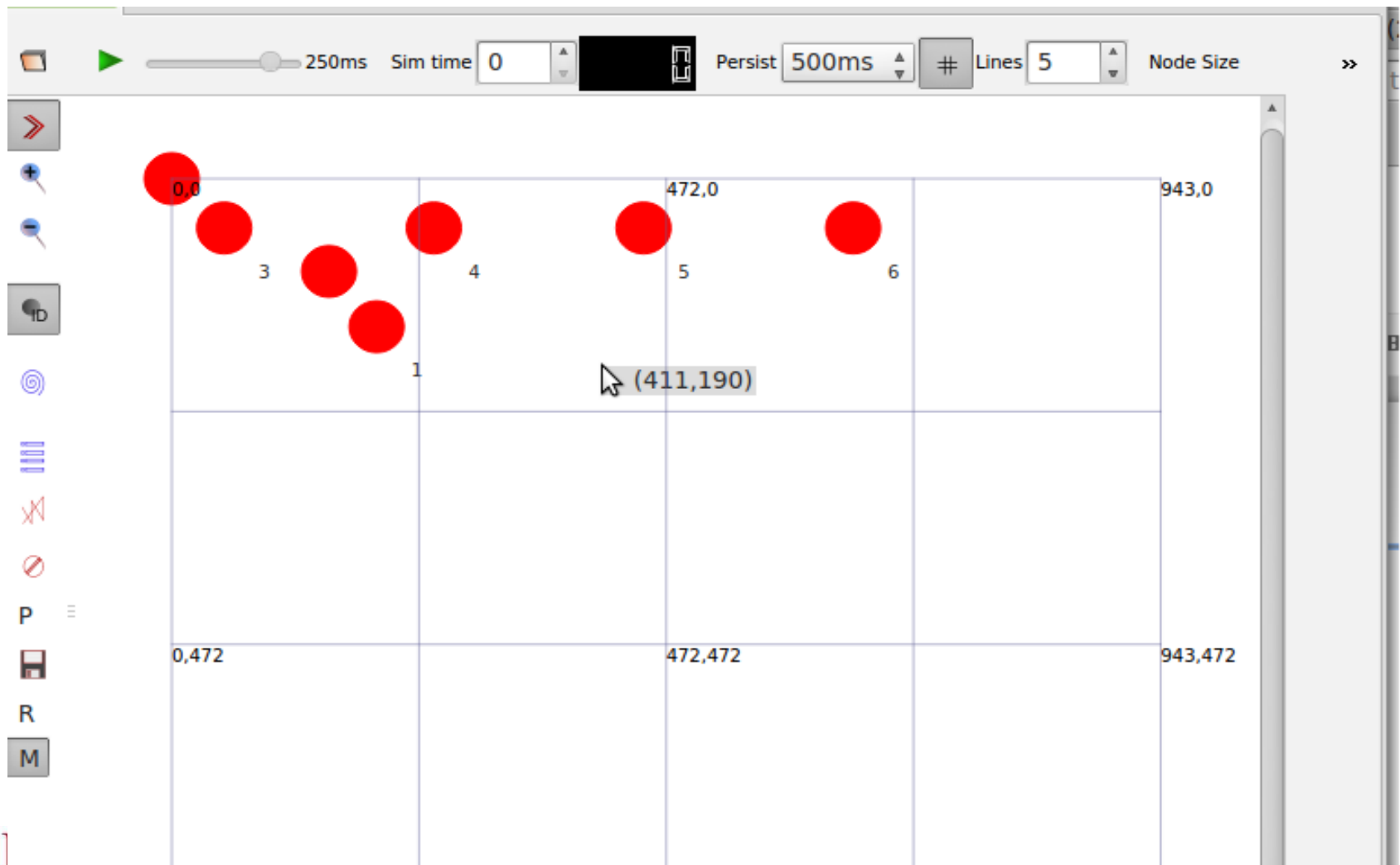
-Node 1: Moves from (600,50) to (100,51)

-Node 2: Moves from (100,51) to (600,50)

-in long/lat

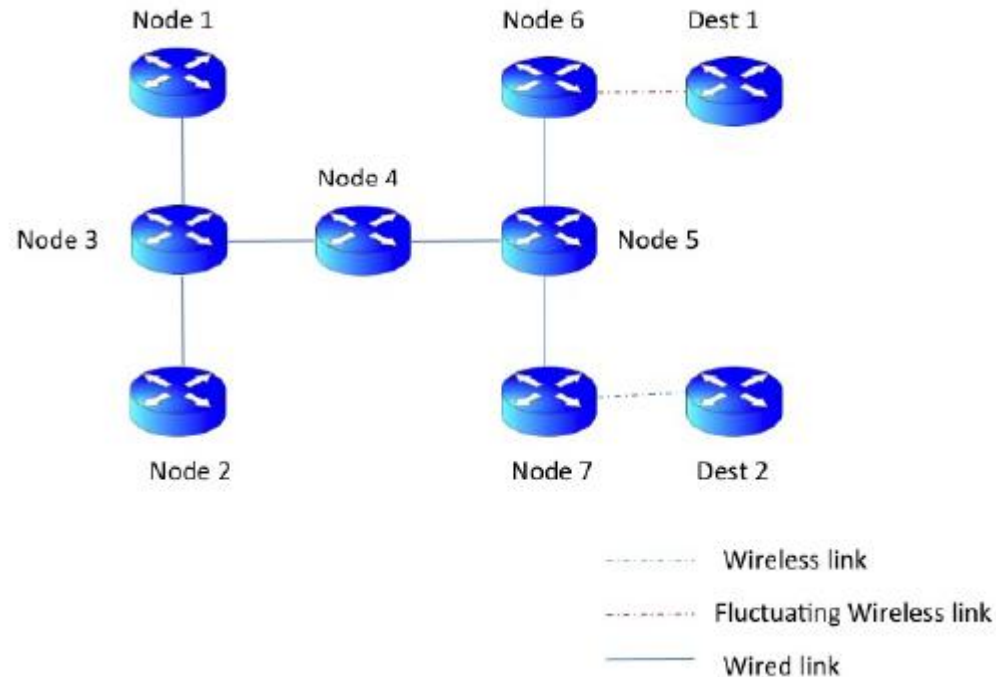
-Constant ~50 m/s

Topology: 3750 pck sent 100 rcvd



Performance Analysis on GSTAR

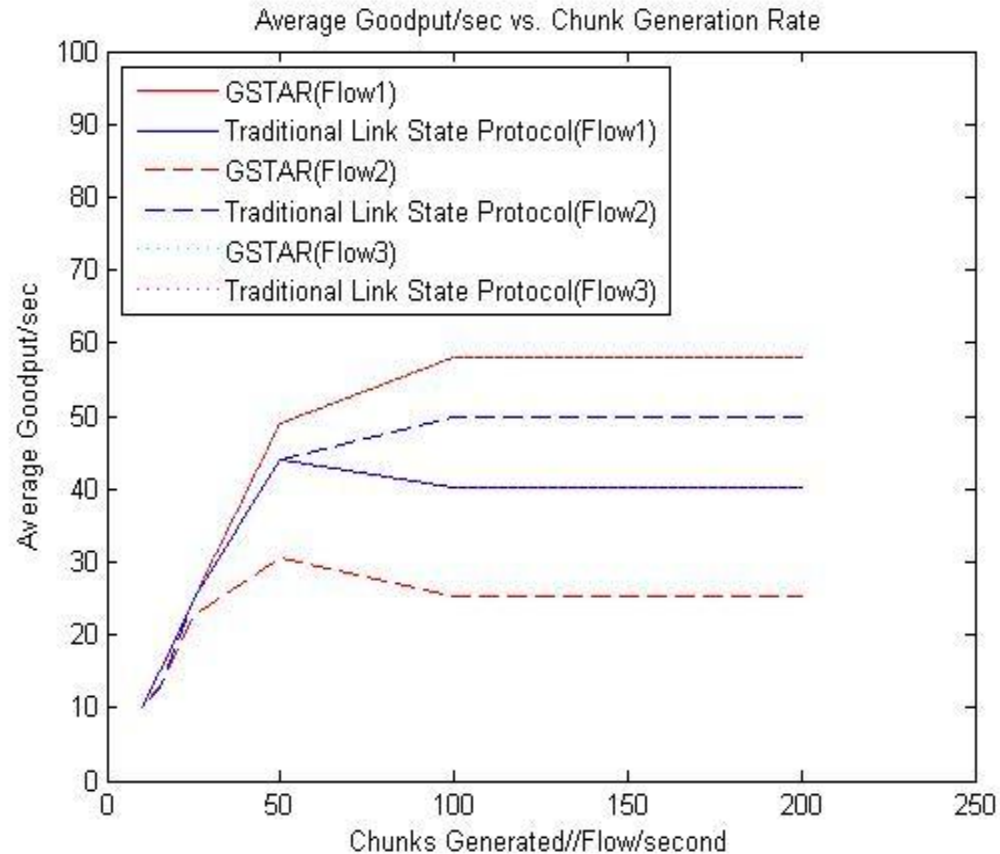
- Multihop network of nine nodes
- Links between Node 6- Dest 1 and Node 7- Dest 2 are wireless, rest are wired
- Three flows:
 1. Node 4 to Dest 2
 2. Node 5 to Dest 1
 3. Node 6 to Dest 1
- Link quality between Node 6- Dest 1 is periodically fluctuated from 54Mbps-6Mbps to simulate congestion



Results:

Simulation Parameters

- Chunk Size: 10 packets
- Chunk generation rate varied from 10chunks/sec to 200 chunks/sec
- Simulation Time: 80 sec
- LETT: average of past 10 ETTs
- Store-forward decision threshold: 1.1



Next Week's Goals:

- Generate random mobility trace for the destination nodes and analyze the performance
- Performance analysis for different threshold conditions and calculation of LETTs

Multicast protocol: Work Done This Week

- Installed and configured GNRS client and server on network nodes.
- Used client to insert GUID and lookup the network addresses
- One GUID can be mapped to multiple network addresses

```
root@node1-1: /usr/local/mobilityfirst/code/prototype/gnrsd/src/client
```

```
gbench.cpp gnrclient.cpp makefile request.data
```

```
root@node1-1: /usr/local/mobilityfirst/code/prototype/gnrsd/src/client# clear
```

```
root@node1-1: /usr/local/mobilityfirst/code/prototype/gnrsd/src/client# ./gnrs-client client.conf
```

```
HASH_FUNC not defined in config,using default: 0
```

```
STL_FUNC not defined in config,using default: 0
```

```
GNRSClient: start timer
```

```
start timer
```

```
client_listen_port:9000
```

```
gethostbyname for hostname:
```

```
waitForAckReceiver starts!
```

```
send out lookup packet
```

```
gethostbyname for hostname: 192.168.1.110
```

```
Received packet from 192.168.1.110:-22521
```

```
cancel gnrclient timingthread
```

```
lookup response message received!
```

```
timer thread canceled:3058514800
```

```
Lookup result: 192.168.88.0:88
```

```
Insert guid: xx123 netaddr: 192.168.88.0:88
```

```
GNRSClient: start timer
```

```
start timer
```

```
timerProc starts
```

```
Received packet from 192.168.1.110:-17349
```

```
Received packet from 192.168.1.110:-4543
```

```
root@node1-1: /usr/local/mobilityfirst/code/prototype/gnrsd/src/client#
```

```
root@node1-1: /usr/local/mobilityfirst/code/prototype/gnrsd/src/server
```

```
guid=9995,locators=9995
```

```
guid=9996,locators=9996
```

```
guid=9997,locators=9997
```

```
guid=9998,locators=9998
```

```
guid=9999,locators=9999
```

```
guid=10000,locators=10000
```

```
execing global query:SELECT * FROM global_guid_locators_map LIMIT 10000,1000
```

```
guid=xx123,locators=192.168.88.0:88
```

```
Read in 10001 mappings from global store
```

```
GNRS : Receiver started
```

```
root@node1-1: /usr/local/mobilityfirst/code/prototype/gnrsd/src/server
```

```
guid=9983,locators=9983
guid=9984,locators=9984
guid=9985,locators=9985
guid=9986,locators=9986
guid=9987,locators=9987
guid=9988,locators=9988
guid=9989,locators=9989
guid=9990,locators=9990
guid=9991,locators=9991
guid=9992,locators=9992
guid=9993,locators=9993
guid=9994,locators=9994
guid=9995,locators=9995
guid=9996,locators=9996
guid=9997,locators=9997
guid=9998,locators=9998
guid=9999,locators=9999
guid=10000,locators=10000
execing global query:SELECT * FROM global_guid_locators_map LIMIT 100,1000
guid=xx123,locators=10.13.1.3
Read in 10001 mappings from global store
GNRS : Receiver started
```

```
root@node1-1: /usr/local/mobilityfirst/code/prototype/gnrsd/src/client
```

```
root@node1-1:/usr/local/mobilityfirst/code/prototype/gnrsd/src/client# ./gnrs-
client client.conf
HASH_FUNC not defined in config,using default: 0
STL_FUNC not defined in config,using default: 0
Lookup result: 10.13.1.3
Insert guid: xx123 netaddr: 10.13.1.3
Insert done!
Lookup guid: xx123
Lookup result: 10.13.1.310.13.1.2
root@node1-1:/usr/local/mobilityfirst/code/prototype/gnrsd/src/client# nano ma
.cpp
root@node1-1:/usr/local/mobilityfirst/code/prototype/gnrsd/src/client# g++ -lp
read -lrt -lconfig++ -I. main.cpp gnrsclient.cpp receiver.cpp ../common/*.cpp
gnrs-client
root@node1-1:/usr/local/mobilityfirst/code/prototype/gnrsd/src/client# ./gnrs-
client client.conf
HASH_FUNC not defined in config,using default: 0
STL_FUNC not defined in config,using default: 0
Lookup result: 10.13.1.3
Insert guid: xx123 netaddr: 10.13.1.3
Insert done!
Lookup guid: xx123
Lookup result: 10.13.1.3 10.13.1.1 10.13.1.2
root@node1-1:/usr/local/mobilityfirst/code/prototype/gnrsd/src/client#
```

Work To Be Done Next Week

- Prototype implementation of simple multicast on click
- Do a study of existing algorithms for large multicast groups