ANALYSIS OF AD-HOC

NETWORKING

ROUTING

PROTOCOLS

**Contents:**

1. Introduction
2. Ad-Hoc Routing Protocols
3. AODV
4. DSR
5. FSR
6. WRP
7. Simulation Scenario
8. Results
9. Conclusion
10. References
11. Input Files -- Config.in
12. Output Files – glomo.stat

**1. INTRODUCTION:**

Since the network nodes are mobile, an ad-hoc network will typically have a dynamic topology which will have a profound effects on network characteristics. Network functions such as routing, address allocation, authentication, and authorization must be designed to cope with a dynamic and volatile network topology. Network nodes will often be battery powered, which limits the capacity of CPU, memory, and bandwidth. This will require network functions that are resource effective. Furthermore, the wireless (radio) media will also affect the behavior of the network due to fluctuating link bandwidths resulting from relatively high error rates.

So we will take a look at 2 reactive and 2 proactive protocols; simulate them and look at their behavior towards throughput, end to end delay and control overhead when we increase mobility.

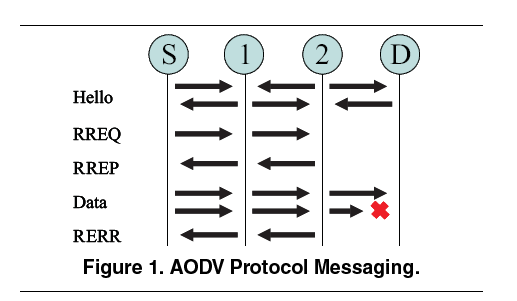
**2. AODV:**

The AODV routing protocol is a reactive routing protocol; therefore, routes are determined only when needed. Figure 1 shows the message exchanges of the AODV protocol.

Hello messages may be used to detect and monitor links to neighbors. If Hello messages are used, each active node periodically broadcasts a Hello message that all its neighbors receive. Because nodes periodically send Hello messages, if a node fails to receive several Hello messages from a neighbor, a link break is detected. When a source has data to transmit to an unknown destination, it broadcasts a Route Request (RREQ) for that destination. At each intermediate node, when a RREQ is received a route to the source is created. If the receiving node has not received this RREQ before, is not the destination and does not have a current route to the destination, it rebroadcasts the RREQ. If the receiving node is the destination

or has a current route to the destination, it generates a Route Reply (RREP). The RREP is unicast in a hop-byhop fashion to the source. As the RREP propagates, each intermediate node creates a route to the destination. When the source receives the RREP, it records the route to the destination and can begin sending data. If multiple RREPs are received by the source, the route with the shortest hop count is chosen.

As data flows from the source to the destination, each node along the route updates the timers associated with the routes to the source and destination, maintaining the routes in the routing table. If a route is not used for some period of time, a node cannot be sure whether the route is still valid; consequently, the node removes the route from its routing table. If data is flowing and a link break is detected, a Route Error (RERR) is sent to the source of the data in a hop-byhop fashion. As the RERR propagates towards the source, each intermediate node invalidates routes to any unreachable destinations. When the source of the data receives the RERR, it invalidates the route and reinitiates route discovery if necessary.



**3. DSR:**

As the name suggests, the Dynamic Source Routing (DSR) protocol uses IP source routing. All data packets that are sent using the DSR protocol contain the complete list of nodes that the packet has to traverse. DSR uses three different types of control packets for route discovery and maintenance, i.e. ROUTE-REQUEST, ROUTE-REPLY and ROUTE-ERROR. During route discovery, the source node broadcasts a ROUTE-REQUEST packet with a unique identification number. The ROUTE-REQUEST packet contains the address of the target node to which a route is desired. All nodes that have no information regarding the target node or have not seen the same ROUTE-REQUEST packet append their IP addresses to the ROUTE-REQUEST packet and rebroadcast it. In order to control the spread of the ROUTE-REQUEST packets, the broadcast is done in a non-propagating manner with the IP Time-To-Live (TTL) field being incremented in each route discovery. The ROUTE-REQUEST packets keep on spreading until they reach the target node or any other node that has a route to the target node. The recipient node creates a ROUTE-REPLY packet, which contains the complete list of nodes that the ROUTE-REQUEST

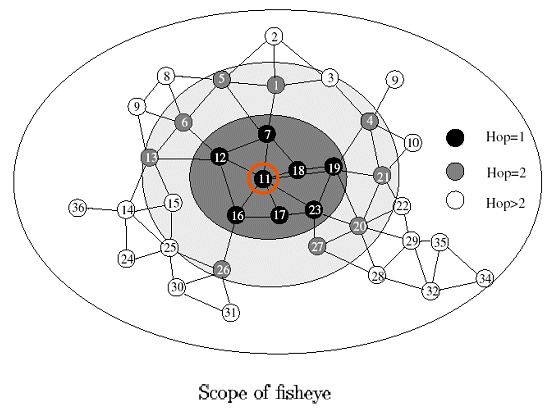
packet has traversed. Depending on the implementation, the target node may respond to one or more incoming ROUTE-REQUEST packets. Similarly, the source node may accept one or more ROUTE-REPLY packets for a single target node. The selection of the ROUTE-REPLY can be made based on minimal hop count or latency. In the multi-path version (DSR-MP) of the DSR protocol, each ROUTE-REQUEST packet that is received by the destination is responded to with an independent ROUTE-REPLY packet. However, only those ROUTE REQUESTs are replied to which are link-wise disjoint from the primary source route. Upon receipt of these ROUTE-REPLY packets, the source node caches the redundant routing information contained in these packets. This routing information is subsequently used to form alternate routes when the primary or secondary routes fail. The source node uses this information to create routes until the cached information becomes invalid, upon which a new route discovery is initiated.

For optimization reasons, nodes maintain a Path Cache or a Link Cache. The former stores complete paths to a particular destination, while the latter only caches information related to individual links. The advantage of the Link Cache scheme is that it allows alternate paths to a destination even when some of the intermediate links have failed. Nodes that either forward or overhear data and control packets add all useful information to their respective cache. This information is used to limit the spread of control packets for subsequent route discoveries.

**4. FSR (Fisheye State Routing)**

FSR is an implicit hierarchical routing protocol. It uses the “fisheye” technique proposed by Kleinrock and Stevens, where the technique was used to reduce the size of information required to represent graphical data. The eye of a fish captures with high detail the pixels near the focal point. The detail decreases as the distance from the focal point increases. In routing, the fisheye approach translates to maintaining accurate distance and path quality information about the immediate neighborhood of a node, with progressively less detail as the distance increases. FSR is functionally similar to Link State Routing in that it maintains a topology map at each node. However in LS, link state packets are generated and flooded into the network whenever a node detects a topology change. In FSR, link state packets are not flooded. Instead, nodes maintain a link state table based on the up-to-date information received from neighboring nodes, and periodically exchange it with their local neighbors only (no flooding). Through this exchange process, the table entries with larger sequence numbers replace the ones with smaller sequence numbers.

In a wireless environment, a radio link between mobile nodes may experience frequent disconnects and reconnects. The LS protocol releases a link state update for each such change, which floods the network and causes excessive overhead. FSR avoids this problem by using periodic, instead of event driven, exchange of the topology map, greatly reducing the control message overhead. When network size grows large, the update message could consume considerable amount of bandwidth, which depends on the update period. In order to reduce the size of update messages without seriously affecting routing accuracy, FSR uses the fisheye technique. Figure illustrates the application of fisheye in a mobile, wireless network. The circles with different shades of grey define the fisheye scopes with respect to the center node (node 11). The scope is defined as the set of nodes that can be reached within a given number of hops. In our case, three scopes are shown for 1, 2 and > 2 hops respectively. Nodes are color coded as black, grey and white accordingly. The number of levels and the radius of each scope will depend on the size of the network.



**5. WRP (Wireless Routing protocol):**

WRP is an extension of the DV protocol that eliminates the possibility of routing loops. Nodes in a network using WRP maintain a set of four tables:

1. Link cost table. This table contains the cost of the link to each immediate neighbor node and information about the status of the link to each immediate neighbor.

2. Distance table. The distance table of a node contains a list of all the possible destination nodes and their distances beyond the immediate neighbors

.

3. Routing table. The routing table contains a list of paths to a destination via different neighbors. If a valid path exists between a source and a destination node, its distance is recorded in the routing table along with information about the next-hop node to reach the destination node.

4. Message retransmission list (MRL). The MRL of a node contains information about acknowledgement (ACK) messages from its neighbors. If a neighbor does not reply with an ACK to a hello message within a certain time, then this information is kept in its MRL and an update is sent only to the non-responding neighbors.

WRP works by requiring each node to send an update message periodically. This update message could be new routing information or a simple ‘hello’ if the routing information has not changed from the previous update. After sending an update message to its all neighbors, a node expects to receive an ACK from all of them. If an ACK message does not come back from a particular neighbor, the node will record the non responding neighbor in MRL and will send another update to the neighbor node later. The nodes receiving the update messages look at the new information in the update message and then update their own routing table and link cost table by finding the best path to a destination. This best-path information is then relayed to all the other nodes so that they can update their routing tables. WRP avoids routing loops by checking the status of all the direct links of a node with its direct neighbors each time a node updates any of its routing information.

**6. Simulation Senario:**

We will take 30 nodes in a terrain of 1000x1000. Set a node moving speed initially to 0 and then increase it gradually to 10 m/s. Simulate it for 3 seconds sending constant bit rate packets after every 4ms from one fixed source to one fixed destination. We took these details and simulated for 4 different protocols

1. AODV

2. DSR

3. FSR

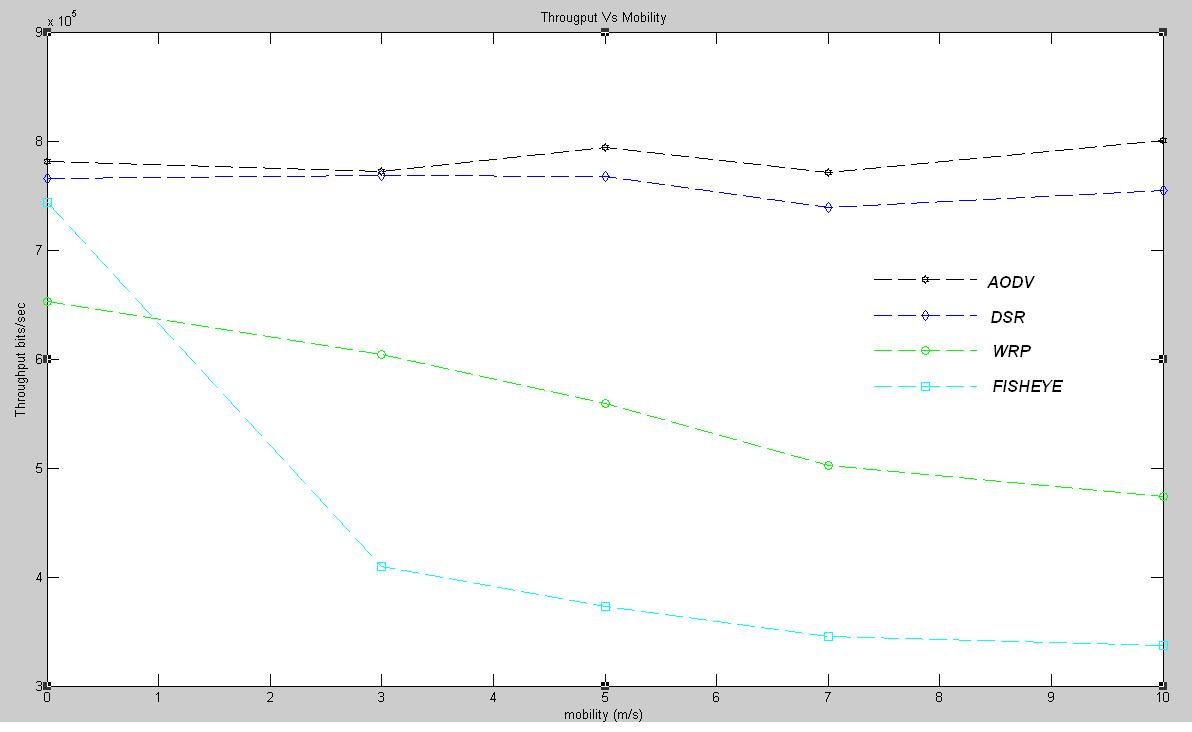
4. WRP

After simulation we plotted throughput, end to end delay and control overhead vs. mobility.

The rest of the details are given in the config.in file in the least section of this report.

**7. Results and Graphs:**

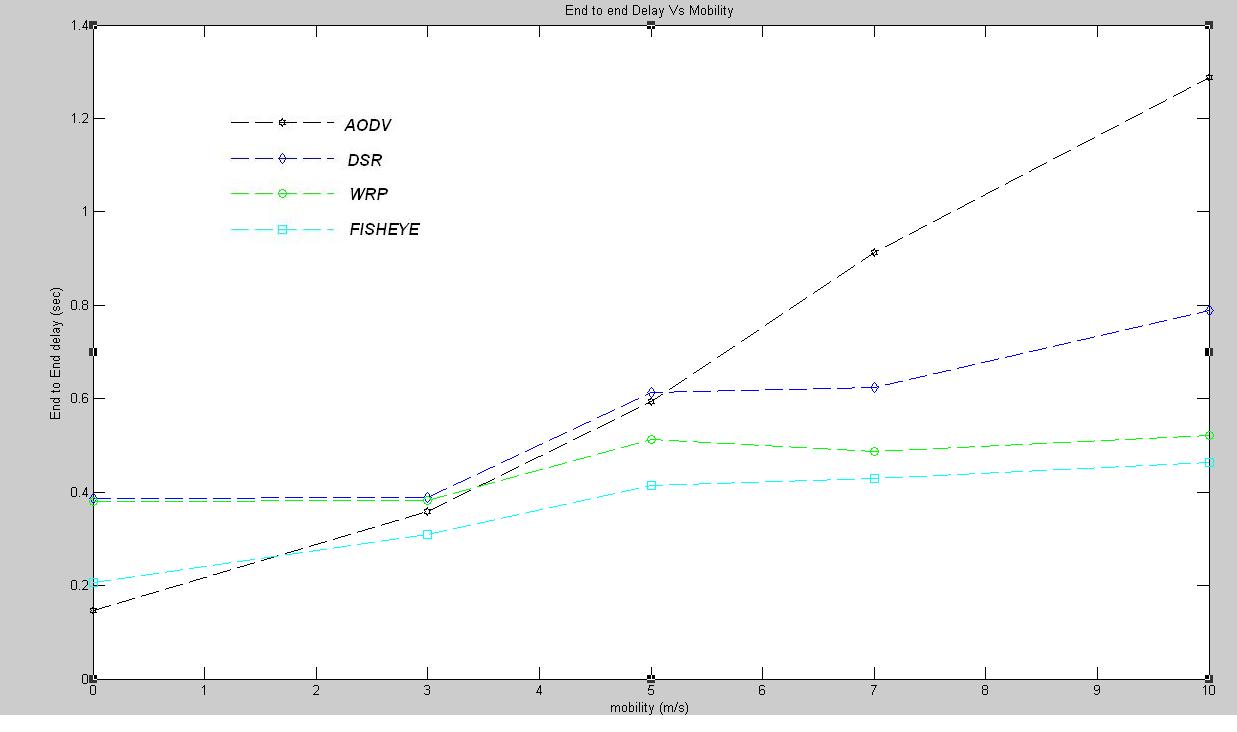
**1. Throughput (bit/sec) vs Mobility (m/s)**



**Analysis:**

As we can observe from the graph that for low mobility AODV and DSR i.e. the reactive protocols show high throughput as compared to both FSR and WRP i.e. proactive protocols. Also as we increase the mobility both reactive protocols gives us better throughput and don’t vary too much. In case for the proactive protocols the throughput decreases as mobility increases. This is due to the fact that the proactive protocols are table-driven protocols and they have to update their table before they can transfer the data to the other node which will take more time as the nodes keep on moving continuously.

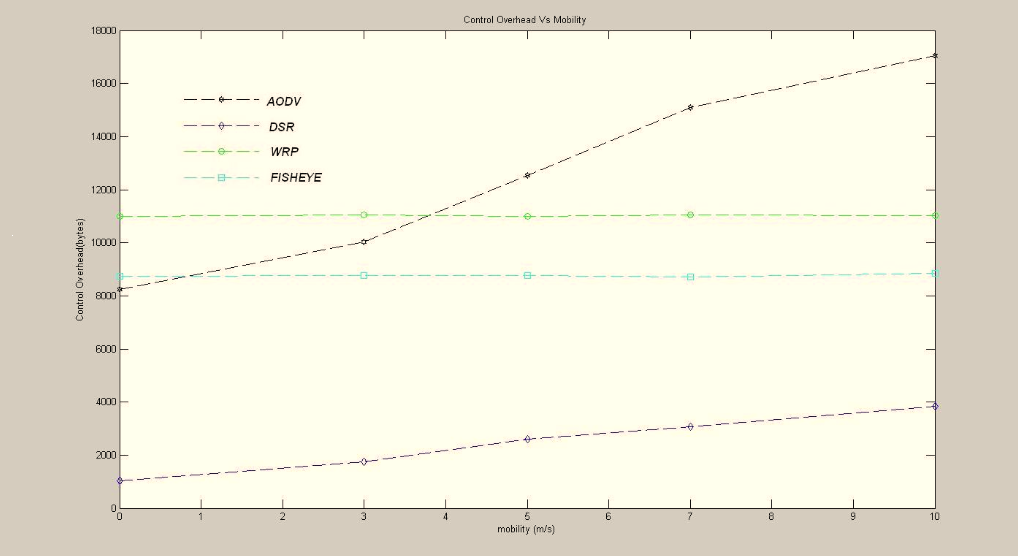
2. **End to End Delay vs Mobility**



**Analysis:**

From the graph above we can observe for low mobility all 4 protocols are close to each other and there is not much difference among them. But as we increase the mobility the reactive protocols AODV and DSR both have higher end to end delays as compared to FSR and WRP. This is due to the fact that both FSR and WRP maintain tables. The tables help them to find the shortest route faster assuming not much movement has happened since the last update. But the reactive protocols try to find the new route at the time of transmission which increases the delay if some nodes have shifted.

**3.** **Control Overhead (Bytes) vs Mobility (m/s)**



**Analysis:**

From the above graph we can observe that for low mobility the proactive protocols like FSR and WRP have high control overhead. This is due to the fact that the proactive protocols are table driven and they will use that to forward the packets, but they may not have updated information resulting in retransmitting data eventually resulting in high overhead. But they tend to remain the same even if we increase the mobility . On the other hand, reactive protocols show less overhead for low mobility and high overhead as we increase the mobility. This is due to the fact they are on demand protocols so they try to find the route when required. So for high mobility the nodes will keep on moving and which will result in high overhead.

**8. Conclusion:**

The simulations presented here clearly show that there is a need for routing protocols specifically tuned to the characteristics of ad-hoc networks. The mobility metric used throughout the study explicitly shows how the examined protocols behave for various degrees of relative node motion. The mobility metric is explicitly designed to capture the kind of motion important for an ad-hoc network – the relative motion of nodes. It can be used for any continuous node motion. In networks with a dynamic topology, proactive protocols such as FSR and WRP have considerable difficulties in maintaining valid routes, and loses many packets because of that. With increasing mobility, its strive to continuously maintain routes to every node increases network load as updates become larger. This study clearly indicates that a reactive routing protocol is superior to a proactive one. The principle of focusing only on explicitly needed connectivity, and not all connectivity, seems to be excellent when the network consists of moving nodes. In addition, the protocol should be able to detect link failures as quickly as possible to avoid use of invalid routes. Overall, the reactive protocols under study (AODV and DSR) behaved similarly in terms of delay and throughput. On the basis of this study both should be considered suitable for mobile ad-hoc networks. However, a number of differences between the protocols do exist.

1. Reactive protocols give a much better throughput as we increase the mobility.
2. Proactive Protocols gives lesser end to end delay for high mobility.
3. The control overhead is high for proactive protocols but it remains constant as we increase the mobility.

**9. References:**

1. Perkins C, Royer EM. Ad hoc on demand distance vector (AODV) routing. In Proceedings of

The Second IEEE Workshop on Mobile Computing Systems and Applications.

2. Broch J, Maltz DA, Johnson DB, Hu Y, Jetcheva J. A performance comparison of multi-hop

wireless network routing protocols. In Proceedings of the Fourth Annual ACM/IEEE

international Conference on Mobile Computing and Networking.

3. Amr M.Hassain Mohamed .Youssef Mohamed M.Zahra ; valuation of Ad Hoc Routing

Protocols in Real Simulation Environments.

4. Fisheye State Routing: A Routing Scheme for Ad HocWireless Networks by Guangyu Pei.

5. David B. Johnson and David A.Maltz, “Dynamic source routing in ad hoc wireless networks”.

**10. Config.in File:**

SIMULATION-TIME 3S

SEED 1

TERRAIN-DIMENSIONS (500, 500)

NUMBER-OF-NODES 30

NODE-PLACEMENT RANDOM

MOBILITY RANDOM-WAYPOINT

MOBILITY-WP-PAUSE 10MS

MOBILITY-WP-MIN-SPEED 5

MOBILITY-WP-MAX-SPEED 5

MOBILITY-POSITION-GRANULARITY 0.5

PROPAGATION-LIMIT -111.0

PROPAGATION-PATHLOSS FREE-SPACE

NOISE-FIGURE 10.0

TEMPARATURE 290.0

RADIO-TYPE RADIO-ACCNOISE

RADIO-FREQUENCY 2.4e9

RADIO-BANDWIDTH 2000000

RADIO-RX-TYPE SNR-BOUNDED

RADIO-RX-SNR-THRESHOLD 10.0

RADIO-TX-POWER 10

RADIO-ANTENNA-GAIN 0.0

RADIO-RX-SENSITIVITY -81.0

RADIO-RX-THRESHOLD -81.0

MAC-PROTOCOL 802.11

NETWORK-PROTOCOL IP

NETWORK-OUTPUT-QUEUE-SIZE-PER-PRIORITY 100

ROUTING-PROTOCOL WRP

#ROUTING-PROTOCOL AODV

#ROUTING-PROTOCOL DSR

#ROUTING-PROTOCOL FISHEYE

APP-CONFIG-FILE ./sim1.conf

APPLICATION-STATISTICS YES

TCP-STATISTICS YES

UDP-STATISTICS YES

ROUTING-STATISTICS YES

NETWORK-LAYER-STATISTICS YES

MAC-LAYER-STATISTICS YES

RADIO-LAYER-STATISTICS YES

CHANNEL-LAYER-STATISTICS YES

MOBILITY-STATISTICS YES

GUI-OPTION YES

GUI-RADIO YES

GUI-ROUTING YES

**11. GLOMO.STAT:**

Node: 0, Layer: RadioAccnoise, Signals transmitted: 3

Node: 0, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 476

Node: 0, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 476

Node: 0, Layer: RadioAccnoise, Signals received and forwarded to MAC: 431

Node: 0, Layer: RadioAccnoise, Collisions: 17

Node: 0, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 0, Layer: 802.11, pkts from network: 0

Node: 0, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 0, Layer: 802.11, BCAST pkts sent to chanl: 3

Node: 0, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 0, Layer: 802.11, BCAST pkts rcvd clearly: 60

Node: 0, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 0, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 0, Layer: 802.11, pkt drops due to retx limit: 0

Node: 0, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 0, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 0, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 3

Node: 0, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 0, Layer: NetworkIp, Number of Packets Delivered To this Node: 60

Node: 0, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3780

Node: 0, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 0, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 0, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 0, Layer: TransportUdp, Number of pkts from application 3.

Node: 0, Layer: TransportUdp, Number of pkts to application 60.

Node: 0, Layer: RoutingWrp, Number of routing packets sent = 3

Node: 0, Layer: RoutingWrp, Number of routing packets recvd = 60

Node: 1, Layer: RadioAccnoise, Signals transmitted: 3

Node: 1, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 718

Node: 1, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 718

Node: 1, Layer: RadioAccnoise, Signals received and forwarded to MAC: 574

Node: 1, Layer: RadioAccnoise, Collisions: 42

Node: 1, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 1, Layer: 802.11, pkts from network: 0

Node: 1, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 1, Layer: 802.11, BCAST pkts sent to chanl: 3

Node: 1, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 1, Layer: 802.11, BCAST pkts rcvd clearly: 57

Node: 1, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 1, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 1, Layer: 802.11, pkt drops due to retx limit: 0

Node: 1, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 1, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 1, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 3

Node: 1, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 1, Layer: NetworkIp, Number of Packets Delivered To this Node: 57

Node: 1, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3591

Node: 1, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 1, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 1, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 1, Layer: TransportUdp, Number of pkts from application 3.

Node: 1, Layer: TransportUdp, Number of pkts to application 57.

Node: 1, Layer: RoutingWrp, Number of routing packets sent = 3

Node: 1, Layer: RoutingWrp, Number of routing packets recvd = 57

Node: 2, Layer: RadioAccnoise, Signals transmitted: 45

Node: 2, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 679

Node: 2, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 679

Node: 2, Layer: RadioAccnoise, Signals received and forwarded to MAC: 534

Node: 2, Layer: RadioAccnoise, Collisions: 42

Node: 2, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.754

Node: 2, Layer: 802.11, pkts from network: 0

Node: 2, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 10

Node: 2, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 2, Layer: 802.11, UCAST pkts rcvd clearly: 10

Node: 2, Layer: 802.11, BCAST pkts rcvd clearly: 58

Node: 2, Layer: 802.11, retx pkts due to CTS timeout: 1

Node: 2, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 2, Layer: 802.11, pkt drops due to retx limit: 0

Node: 2, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 2, Layer: 802.11, RTS Packets ignored due to NAV 8

Node: 2, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 14

Node: 2, Layer: NetworkIp, Number of Packets Routed For Another Node: 10

Node: 2, Layer: NetworkIp, Number of Packets Delivered To this Node: 58

Node: 2, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3654

Node: 2, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 2, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 2, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 2, Layer: TransportUdp, Number of pkts from application 4.

Node: 2, Layer: TransportUdp, Number of pkts to application 58.

Node: 2, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 2, Layer: RoutingWrp, Number of routing packets recvd = 58

Node: 3, Layer: RadioAccnoise, Signals transmitted: 6

Node: 3, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 876

Node: 3, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 876

Node: 3, Layer: RadioAccnoise, Signals received and forwarded to MAC: 722

Node: 3, Layer: RadioAccnoise, Collisions: 47

Node: 3, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 3, Layer: 802.11, pkts from network: 0

Node: 3, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 3, Layer: 802.11, BCAST pkts sent to chanl: 6

Node: 3, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 3, Layer: 802.11, BCAST pkts rcvd clearly: 59

Node: 3, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 3, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 3, Layer: 802.11, pkt drops due to retx limit: 0

Node: 3, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 3, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 3, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 6

Node: 3, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 3, Layer: NetworkIp, Number of Packets Delivered To this Node: 59

Node: 3, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3717

Node: 3, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 3, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 3, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 3, Layer: TransportUdp, Number of pkts from application 6.

Node: 3, Layer: TransportUdp, Number of pkts to application 59.

Node: 3, Layer: RoutingWrp, Number of routing packets sent = 6

Node: 3, Layer: RoutingWrp, Number of routing packets recvd = 59

Node: 4, Layer: RadioAccnoise, Signals transmitted: 6

Node: 4, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 695

Node: 4, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 695

Node: 4, Layer: RadioAccnoise, Signals received and forwarded to MAC: 569

Node: 4, Layer: RadioAccnoise, Collisions: 39

Node: 4, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.751

Node: 4, Layer: 802.11, pkts from network: 0

Node: 4, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 4, Layer: 802.11, BCAST pkts sent to chanl: 6

Node: 4, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 4, Layer: 802.11, BCAST pkts rcvd clearly: 49

Node: 4, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 4, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 4, Layer: 802.11, pkt drops due to retx limit: 0

Node: 4, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 4, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 4, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 6

Node: 4, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 4, Layer: NetworkIp, Number of Packets Delivered To this Node: 49

Node: 4, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3087

Node: 4, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 4, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 4, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 4, Layer: TransportUdp, Number of pkts from application 6.

Node: 4, Layer: TransportUdp, Number of pkts to application 49.

Node: 4, Layer: RoutingWrp, Number of routing packets sent = 6

Node: 4, Layer: RoutingWrp, Number of routing packets recvd = 49

Node: 5, Layer: RadioAccnoise, Signals transmitted: 238

Node: 5, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 377

Node: 5, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 377

Node: 5, Layer: RadioAccnoise, Signals received and forwarded to MAC: 350

Node: 5, Layer: RadioAccnoise, Collisions: 3

Node: 5, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.774

Node: 5, Layer: 802.11, pkts from network: 0

Node: 5, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 76

Node: 5, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 5, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 5, Layer: 802.11, BCAST pkts rcvd clearly: 48

Node: 5, Layer: 802.11, retx pkts due to CTS timeout: 79

Node: 5, Layer: 802.11, retx pkts due to ACK timeout: 1

Node: 5, Layer: 802.11, pkt drops due to retx limit: 2

Node: 5, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 5, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 5, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 160

Node: 5, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 5, Layer: NetworkIp, Number of Packets Delivered To this Node: 48

Node: 5, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3024

Node: 5, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 5, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 145

Node: 5, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 5, Layer: TransportUdp, Number of pkts from application 305.

Node: 5, Layer: TransportUdp, Number of pkts to application 48.

Node: 5, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 5, Layer: RoutingWrp, Number of routing packets recvd = 48

Node: 5, Layer: AppCbrClient, (0) Server address: 27

Node: 5, Layer: AppCbrClient, (0) First packet sent at [s]: 0.000000000

Node: 5, Layer: AppCbrClient, (0) Last packet sent at [s]: 2.990000000

Node: 5, Layer: AppCbrClient, (0) Session status: Not closed

Node: 5, Layer: AppCbrClient, (0) Total number of bytes sent: 450000

Node: 5, Layer: AppCbrClient, (0) Total number of packets sent: 300

Node: 5, Layer: AppCbrClient, (0) Throughput (bits per second): 1200000

Node: 6, Layer: RadioAccnoise, Signals transmitted: 4

Node: 6, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 609

Node: 6, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 609

Node: 6, Layer: RadioAccnoise, Signals received and forwarded to MAC: 563

Node: 6, Layer: RadioAccnoise, Collisions: 18

Node: 6, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 6, Layer: 802.11, pkts from network: 0

Node: 6, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 6, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 6, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 6, Layer: 802.11, BCAST pkts rcvd clearly: 58

Node: 6, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 6, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 6, Layer: 802.11, pkt drops due to retx limit: 0

Node: 6, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 6, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 6, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 6, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 6, Layer: NetworkIp, Number of Packets Delivered To this Node: 58

Node: 6, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3654

Node: 6, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 6, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 6, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 6, Layer: TransportUdp, Number of pkts from application 4.

Node: 6, Layer: TransportUdp, Number of pkts to application 58.

Node: 6, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 6, Layer: RoutingWrp, Number of routing packets recvd = 58

Node: 7, Layer: RadioAccnoise, Signals transmitted: 273

Node: 7, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 614

Node: 7, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 614

Node: 7, Layer: RadioAccnoise, Signals received and forwarded to MAC: 480

Node: 7, Layer: RadioAccnoise, Collisions: 24

Node: 7, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.772

Node: 7, Layer: 802.11, pkts from network: 0

Node: 7, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 66

Node: 7, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 7, Layer: 802.11, UCAST pkts rcvd clearly: 66

Node: 7, Layer: 802.11, BCAST pkts rcvd clearly: 63

Node: 7, Layer: 802.11, retx pkts due to CTS timeout: 3

Node: 7, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 7, Layer: 802.11, pkt drops due to retx limit: 0

Node: 7, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 7, Layer: 802.11, RTS Packets ignored due to NAV 2

Node: 7, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 71

Node: 7, Layer: NetworkIp, Number of Packets Routed For Another Node: 66

Node: 7, Layer: NetworkIp, Number of Packets Delivered To this Node: 63

Node: 7, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3969

Node: 7, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 7, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 7, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 7, Layer: TransportUdp, Number of pkts from application 5.

Node: 7, Layer: TransportUdp, Number of pkts to application 63.

Node: 7, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 7, Layer: RoutingWrp, Number of routing packets recvd = 63

Node: 8, Layer: RadioAccnoise, Signals transmitted: 4

Node: 8, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 890

Node: 8, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 890

Node: 8, Layer: RadioAccnoise, Signals received and forwarded to MAC: 720

Node: 8, Layer: RadioAccnoise, Collisions: 51

Node: 8, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 8, Layer: 802.11, pkts from network: 0

Node: 8, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 8, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 8, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 8, Layer: 802.11, BCAST pkts rcvd clearly: 60

Node: 8, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 8, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 8, Layer: 802.11, pkt drops due to retx limit: 0

Node: 8, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 8, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 8, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 8, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 8, Layer: NetworkIp, Number of Packets Delivered To this Node: 60

Node: 8, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3780

Node: 8, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 8, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 8, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 8, Layer: TransportUdp, Number of pkts from application 4.

Node: 8, Layer: TransportUdp, Number of pkts to application 60.

Node: 8, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 8, Layer: RoutingWrp, Number of routing packets recvd = 60

Node: 9, Layer: RadioAccnoise, Signals transmitted: 3

Node: 9, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 888

Node: 9, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 888

Node: 9, Layer: RadioAccnoise, Signals received and forwarded to MAC: 720

Node: 9, Layer: RadioAccnoise, Collisions: 52

Node: 9, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 9, Layer: 802.11, pkts from network: 0

Node: 9, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 9, Layer: 802.11, BCAST pkts sent to chanl: 3

Node: 9, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 9, Layer: 802.11, BCAST pkts rcvd clearly: 61

Node: 9, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 9, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 9, Layer: 802.11, pkt drops due to retx limit: 0

Node: 9, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 9, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 9, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 3

Node: 9, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 9, Layer: NetworkIp, Number of Packets Delivered To this Node: 61

Node: 9, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3843

Node: 9, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 9, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 9, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 9, Layer: TransportUdp, Number of pkts from application 3.

Node: 9, Layer: TransportUdp, Number of pkts to application 61.

Node: 9, Layer: RoutingWrp, Number of routing packets sent = 3

Node: 9, Layer: RoutingWrp, Number of routing packets recvd = 61

Node: 10, Layer: RadioAccnoise, Signals transmitted: 4

Node: 10, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 890

Node: 10, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 890

Node: 10, Layer: RadioAccnoise, Signals received and forwarded to MAC: 718

Node: 10, Layer: RadioAccnoise, Collisions: 52

Node: 10, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 10, Layer: 802.11, pkts from network: 0

Node: 10, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 10, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 10, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 10, Layer: 802.11, BCAST pkts rcvd clearly: 61

Node: 10, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 10, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 10, Layer: 802.11, pkt drops due to retx limit: 0

Node: 10, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 10, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 10, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 10, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 10, Layer: NetworkIp, Number of Packets Delivered To this Node: 61

Node: 10, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3843

Node: 10, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 10, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 10, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 10, Layer: TransportUdp, Number of pkts from application 4.

Node: 10, Layer: TransportUdp, Number of pkts to application 61.

Node: 10, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 10, Layer: RoutingWrp, Number of routing packets recvd = 61

Node: 11, Layer: RadioAccnoise, Signals transmitted: 5

Node: 11, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 867

Node: 11, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 867

Node: 11, Layer: RadioAccnoise, Signals received and forwarded to MAC: 776

Node: 11, Layer: RadioAccnoise, Collisions: 12

Node: 11, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 11, Layer: 802.11, pkts from network: 0

Node: 11, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 11, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 11, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 11, Layer: 802.11, BCAST pkts rcvd clearly: 59

Node: 11, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 11, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 11, Layer: 802.11, pkt drops due to retx limit: 0

Node: 11, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 11, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 11, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 5

Node: 11, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 11, Layer: NetworkIp, Number of Packets Delivered To this Node: 59

Node: 11, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3717

Node: 11, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 11, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 11, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 11, Layer: TransportUdp, Number of pkts from application 5.

Node: 11, Layer: TransportUdp, Number of pkts to application 59.

Node: 11, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 11, Layer: RoutingWrp, Number of routing packets recvd = 59

Node: 12, Layer: RadioAccnoise, Signals transmitted: 4

Node: 12, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 625

Node: 12, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 625

Node: 12, Layer: RadioAccnoise, Signals received and forwarded to MAC: 578

Node: 12, Layer: RadioAccnoise, Collisions: 22

Node: 12, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 12, Layer: 802.11, pkts from network: 0

Node: 12, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 12, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 12, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 12, Layer: 802.11, BCAST pkts rcvd clearly: 56

Node: 12, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 12, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 12, Layer: 802.11, pkt drops due to retx limit: 0

Node: 12, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 12, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 12, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 12, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 12, Layer: NetworkIp, Number of Packets Delivered To this Node: 56

Node: 12, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3528

Node: 12, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 12, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 12, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 12, Layer: TransportUdp, Number of pkts from application 4.

Node: 12, Layer: TransportUdp, Number of pkts to application 56.

Node: 12, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 12, Layer: RoutingWrp, Number of routing packets recvd = 56

Node: 13, Layer: RadioAccnoise, Signals transmitted: 69

Node: 13, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 579

Node: 13, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 579

Node: 13, Layer: RadioAccnoise, Signals received and forwarded to MAC: 524

Node: 13, Layer: RadioAccnoise, Collisions: 22

Node: 13, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.756

Node: 13, Layer: 802.11, pkts from network: 0

Node: 13, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 4

Node: 13, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 13, Layer: 802.11, UCAST pkts rcvd clearly: 10

Node: 13, Layer: 802.11, BCAST pkts rcvd clearly: 64

Node: 13, Layer: 802.11, retx pkts due to CTS timeout: 10

Node: 13, Layer: 802.11, retx pkts due to ACK timeout: 13

Node: 13, Layer: 802.11, pkt drops due to retx limit: 1

Node: 13, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 13, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 13, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 15

Node: 13, Layer: NetworkIp, Number of Packets Routed For Another Node: 10

Node: 13, Layer: NetworkIp, Number of Packets Delivered To this Node: 64

Node: 13, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 4032

Node: 13, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 13, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 13, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 13, Layer: TransportUdp, Number of pkts from application 5.

Node: 13, Layer: TransportUdp, Number of pkts to application 64.

Node: 13, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 13, Layer: RoutingWrp, Number of routing packets recvd = 64

Node: 14, Layer: RadioAccnoise, Signals transmitted: 4

Node: 14, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 890

Node: 14, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 890

Node: 14, Layer: RadioAccnoise, Signals received and forwarded to MAC: 718

Node: 14, Layer: RadioAccnoise, Collisions: 52

Node: 14, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 14, Layer: 802.11, pkts from network: 0

Node: 14, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 14, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 14, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 14, Layer: 802.11, BCAST pkts rcvd clearly: 61

Node: 14, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 14, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 14, Layer: 802.11, pkt drops due to retx limit: 0

Node: 14, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 14, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 14, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 14, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 14, Layer: NetworkIp, Number of Packets Delivered To this Node: 61

Node: 14, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3843

Node: 14, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 14, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 14, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 14, Layer: TransportUdp, Number of pkts from application 4.

Node: 14, Layer: TransportUdp, Number of pkts to application 61.

Node: 14, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 14, Layer: RoutingWrp, Number of routing packets recvd = 61

Node: 15, Layer: RadioAccnoise, Signals transmitted: 4

Node: 15, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 890

Node: 15, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 890

Node: 15, Layer: RadioAccnoise, Signals received and forwarded to MAC: 717

Node: 15, Layer: RadioAccnoise, Collisions: 53

Node: 15, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 15, Layer: 802.11, pkts from network: 0

Node: 15, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 15, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 15, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 15, Layer: 802.11, BCAST pkts rcvd clearly: 60

Node: 15, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 15, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 15, Layer: 802.11, pkt drops due to retx limit: 0

Node: 15, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 15, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 15, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 15, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 15, Layer: NetworkIp, Number of Packets Delivered To this Node: 60

Node: 15, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3780

Node: 15, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 15, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 15, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 15, Layer: TransportUdp, Number of pkts from application 4.

Node: 15, Layer: TransportUdp, Number of pkts to application 60.

Node: 15, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 15, Layer: RoutingWrp, Number of routing packets recvd = 60

Node: 16, Layer: RadioAccnoise, Signals transmitted: 3

Node: 16, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 891

Node: 16, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 891

Node: 16, Layer: RadioAccnoise, Signals received and forwarded to MAC: 718

Node: 16, Layer: RadioAccnoise, Collisions: 53

Node: 16, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 16, Layer: 802.11, pkts from network: 0

Node: 16, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 16, Layer: 802.11, BCAST pkts sent to chanl: 3

Node: 16, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 16, Layer: 802.11, BCAST pkts rcvd clearly: 61

Node: 16, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 16, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 16, Layer: 802.11, pkt drops due to retx limit: 0

Node: 16, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 16, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 16, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 3

Node: 16, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 16, Layer: NetworkIp, Number of Packets Delivered To this Node: 61

Node: 16, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3843

Node: 16, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 16, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 16, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 16, Layer: TransportUdp, Number of pkts from application 3.

Node: 16, Layer: TransportUdp, Number of pkts to application 61.

Node: 16, Layer: RoutingWrp, Number of routing packets sent = 3

Node: 16, Layer: RoutingWrp, Number of routing packets recvd = 61

Node: 17, Layer: RadioAccnoise, Signals transmitted: 4

Node: 17, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 865

Node: 17, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 865

Node: 17, Layer: RadioAccnoise, Signals received and forwarded to MAC: 728

Node: 17, Layer: RadioAccnoise, Collisions: 44

Node: 17, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 17, Layer: 802.11, pkts from network: 0

Node: 17, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 17, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 17, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 17, Layer: 802.11, BCAST pkts rcvd clearly: 59

Node: 17, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 17, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 17, Layer: 802.11, pkt drops due to retx limit: 0

Node: 17, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 17, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 17, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 17, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 17, Layer: NetworkIp, Number of Packets Delivered To this Node: 59

Node: 17, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3717

Node: 17, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 17, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 17, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 17, Layer: TransportUdp, Number of pkts from application 4.

Node: 17, Layer: TransportUdp, Number of pkts to application 59.

Node: 17, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 17, Layer: RoutingWrp, Number of routing packets recvd = 59

Node: 18, Layer: RadioAccnoise, Signals transmitted: 6

Node: 18, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 627

Node: 18, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 627

Node: 18, Layer: RadioAccnoise, Signals received and forwarded to MAC: 582

Node: 18, Layer: RadioAccnoise, Collisions: 19

Node: 18, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.751

Node: 18, Layer: 802.11, pkts from network: 0

Node: 18, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 18, Layer: 802.11, BCAST pkts sent to chanl: 6

Node: 18, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 18, Layer: 802.11, BCAST pkts rcvd clearly: 61

Node: 18, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 18, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 18, Layer: 802.11, pkt drops due to retx limit: 0

Node: 18, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 18, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 18, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 6

Node: 18, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 18, Layer: NetworkIp, Number of Packets Delivered To this Node: 61

Node: 18, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3843

Node: 18, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 18, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 18, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 18, Layer: TransportUdp, Number of pkts from application 6.

Node: 18, Layer: TransportUdp, Number of pkts to application 61.

Node: 18, Layer: RoutingWrp, Number of routing packets sent = 6

Node: 18, Layer: RoutingWrp, Number of routing packets recvd = 61

Node: 19, Layer: RadioAccnoise, Signals transmitted: 5

Node: 19, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 645

Node: 19, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 645

Node: 19, Layer: RadioAccnoise, Signals received and forwarded to MAC: 578

Node: 19, Layer: RadioAccnoise, Collisions: 30

Node: 19, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.751

Node: 19, Layer: 802.11, pkts from network: 0

Node: 19, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 19, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 19, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 19, Layer: 802.11, BCAST pkts rcvd clearly: 74

Node: 19, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 19, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 19, Layer: 802.11, pkt drops due to retx limit: 0

Node: 19, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 19, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 19, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 5

Node: 19, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 19, Layer: NetworkIp, Number of Packets Delivered To this Node: 74

Node: 19, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 4662

Node: 19, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 19, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 19, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 19, Layer: TransportUdp, Number of pkts from application 5.

Node: 19, Layer: TransportUdp, Number of pkts to application 74.

Node: 19, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 19, Layer: RoutingWrp, Number of routing packets recvd = 74

Node: 20, Layer: RadioAccnoise, Signals transmitted: 5

Node: 20, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 651

Node: 20, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 651

Node: 20, Layer: RadioAccnoise, Signals received and forwarded to MAC: 575

Node: 20, Layer: RadioAccnoise, Collisions: 35

Node: 20, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 20, Layer: 802.11, pkts from network: 0

Node: 20, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 20, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 20, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 20, Layer: 802.11, BCAST pkts rcvd clearly: 71

Node: 20, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 20, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 20, Layer: 802.11, pkt drops due to retx limit: 0

Node: 20, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 20, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 20, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 5

Node: 20, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 20, Layer: NetworkIp, Number of Packets Delivered To this Node: 71

Node: 20, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 4473

Node: 20, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 20, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 20, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 20, Layer: TransportUdp, Number of pkts from application 5.

Node: 20, Layer: TransportUdp, Number of pkts to application 71.

Node: 20, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 20, Layer: RoutingWrp, Number of routing packets recvd = 71

Node: 21, Layer: RadioAccnoise, Signals transmitted: 5

Node: 21, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 651

Node: 21, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 651

Node: 21, Layer: RadioAccnoise, Signals received and forwarded to MAC: 578

Node: 21, Layer: RadioAccnoise, Collisions: 32

Node: 21, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 21, Layer: 802.11, pkts from network: 0

Node: 21, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 21, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 21, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 21, Layer: 802.11, BCAST pkts rcvd clearly: 70

Node: 21, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 21, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 21, Layer: 802.11, pkt drops due to retx limit: 0

Node: 21, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 21, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 21, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 5

Node: 21, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 21, Layer: NetworkIp, Number of Packets Delivered To this Node: 70

Node: 21, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 4410

Node: 21, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 21, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 21, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 21, Layer: TransportUdp, Number of pkts from application 5.

Node: 21, Layer: TransportUdp, Number of pkts to application 70.

Node: 21, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 21, Layer: RoutingWrp, Number of routing packets recvd = 70

Node: 22, Layer: RadioAccnoise, Signals transmitted: 4

Node: 22, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 890

Node: 22, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 890

Node: 22, Layer: RadioAccnoise, Signals received and forwarded to MAC: 718

Node: 22, Layer: RadioAccnoise, Collisions: 53

Node: 22, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 22, Layer: 802.11, pkts from network: 0

Node: 22, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 22, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 22, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 22, Layer: 802.11, BCAST pkts rcvd clearly: 61

Node: 22, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 22, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 22, Layer: 802.11, pkt drops due to retx limit: 0

Node: 22, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 22, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 22, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 22, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 22, Layer: NetworkIp, Number of Packets Delivered To this Node: 61

Node: 22, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3843

Node: 22, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 22, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 22, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 22, Layer: TransportUdp, Number of pkts from application 4.

Node: 22, Layer: TransportUdp, Number of pkts to application 61.

Node: 22, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 22, Layer: RoutingWrp, Number of routing packets recvd = 61

Node: 23, Layer: RadioAccnoise, Signals transmitted: 5

Node: 23, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 562

Node: 23, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 562

Node: 23, Layer: RadioAccnoise, Signals received and forwarded to MAC: 480

Node: 23, Layer: RadioAccnoise, Collisions: 30

Node: 23, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 23, Layer: 802.11, pkts from network: 0

Node: 23, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 23, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 23, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 23, Layer: 802.11, BCAST pkts rcvd clearly: 50

Node: 23, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 23, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 23, Layer: 802.11, pkt drops due to retx limit: 0

Node: 23, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 23, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 23, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 5

Node: 23, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 23, Layer: NetworkIp, Number of Packets Delivered To this Node: 50

Node: 23, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3150

Node: 23, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 23, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 23, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 23, Layer: TransportUdp, Number of pkts from application 5.

Node: 23, Layer: TransportUdp, Number of pkts to application 50.

Node: 23, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 23, Layer: RoutingWrp, Number of routing packets recvd = 50

Node: 24, Layer: RadioAccnoise, Signals transmitted: 3

Node: 24, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 624

Node: 24, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 624

Node: 24, Layer: RadioAccnoise, Signals received and forwarded to MAC: 568

Node: 24, Layer: RadioAccnoise, Collisions: 32

Node: 24, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 24, Layer: 802.11, pkts from network: 0

Node: 24, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 24, Layer: 802.11, BCAST pkts sent to chanl: 3

Node: 24, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 24, Layer: 802.11, BCAST pkts rcvd clearly: 60

Node: 24, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 24, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 24, Layer: 802.11, pkt drops due to retx limit: 0

Node: 24, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 24, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 24, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 3

Node: 24, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 24, Layer: NetworkIp, Number of Packets Delivered To this Node: 60

Node: 24, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3780

Node: 24, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 24, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 24, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 24, Layer: TransportUdp, Number of pkts from application 3.

Node: 24, Layer: TransportUdp, Number of pkts to application 60.

Node: 24, Layer: RoutingWrp, Number of routing packets sent = 3

Node: 24, Layer: RoutingWrp, Number of routing packets recvd = 60

Node: 25, Layer: RadioAccnoise, Signals transmitted: 5

Node: 25, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 630

Node: 25, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 630

Node: 25, Layer: RadioAccnoise, Signals received and forwarded to MAC: 568

Node: 25, Layer: RadioAccnoise, Collisions: 30

Node: 25, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 25, Layer: 802.11, pkts from network: 0

Node: 25, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 25, Layer: 802.11, BCAST pkts sent to chanl: 5

Node: 25, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 25, Layer: 802.11, BCAST pkts rcvd clearly: 62

Node: 25, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 25, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 25, Layer: 802.11, pkt drops due to retx limit: 0

Node: 25, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 25, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 25, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 5

Node: 25, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 25, Layer: NetworkIp, Number of Packets Delivered To this Node: 62

Node: 25, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3906

Node: 25, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 25, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 25, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 25, Layer: TransportUdp, Number of pkts from application 5.

Node: 25, Layer: TransportUdp, Number of pkts to application 62.

Node: 25, Layer: RoutingWrp, Number of routing packets sent = 5

Node: 25, Layer: RoutingWrp, Number of routing packets recvd = 62

Node: 26, Layer: RadioAccnoise, Signals transmitted: 6

Node: 26, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 644

Node: 26, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 644

Node: 26, Layer: RadioAccnoise, Signals received and forwarded to MAC: 577

Node: 26, Layer: RadioAccnoise, Collisions: 30

Node: 26, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.751

Node: 26, Layer: 802.11, pkts from network: 0

Node: 26, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 26, Layer: 802.11, BCAST pkts sent to chanl: 6

Node: 26, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 26, Layer: 802.11, BCAST pkts rcvd clearly: 69

Node: 26, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 26, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 26, Layer: 802.11, pkt drops due to retx limit: 0

Node: 26, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 26, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 26, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 6

Node: 26, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 26, Layer: NetworkIp, Number of Packets Delivered To this Node: 69

Node: 26, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 4347

Node: 26, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 26, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 26, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 26, Layer: TransportUdp, Number of pkts from application 6.

Node: 26, Layer: TransportUdp, Number of pkts to application 69.

Node: 26, Layer: RoutingWrp, Number of routing packets sent = 6

Node: 26, Layer: RoutingWrp, Number of routing packets recvd = 69

Node: 27, Layer: RadioAccnoise, Signals transmitted: 161

Node: 27, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 435

Node: 27, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 435

Node: 27, Layer: RadioAccnoise, Signals received and forwarded to MAC: 375

Node: 27, Layer: RadioAccnoise, Collisions: 32

Node: 27, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.752

Node: 27, Layer: 802.11, pkts from network: 0

Node: 27, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 27, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 27, Layer: 802.11, UCAST pkts rcvd clearly: 70

Node: 27, Layer: 802.11, BCAST pkts rcvd clearly: 62

Node: 27, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 27, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 27, Layer: 802.11, pkt drops due to retx limit: 0

Node: 27, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 27, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 27, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 27, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 27, Layer: NetworkIp, Number of Packets Delivered To this Node: 132

Node: 27, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 8242

Node: 27, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 27, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 27, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 27, Layer: TransportUdp, Number of pkts from application 4.

Node: 27, Layer: TransportUdp, Number of pkts to application 132.

Node: 27, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 27, Layer: RoutingWrp, Number of routing packets recvd = 62

Node: 27, Layer: AppCbrServer, (0) Client address: 5

Node: 27, Layer: AppCbrServer, (0) First packet received at [s]: 1.498859106

Node: 27, Layer: AppCbrServer, (0) Last packet received at [s]: 2.998561941

Node: 27, Layer: AppCbrServer, (0) Average end-to-end delay [s]: 0.535454887

Node: 27, Layer: AppCbrServer, (0) Session status: Not closed

Node: 27, Layer: AppCbrServer, (0) Total number of bytes received: 105000

Node: 27, Layer: AppCbrServer, (0) Total number of packets received: 70

Node: 27, Layer: AppCbrServer, (0) Throughput (bits per second): 559574

Node: 28, Layer: RadioAccnoise, Signals transmitted: 4

Node: 28, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 875

Node: 28, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 875

Node: 28, Layer: RadioAccnoise, Signals received and forwarded to MAC: 722

Node: 28, Layer: RadioAccnoise, Collisions: 49

Node: 28, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 28, Layer: 802.11, pkts from network: 0

Node: 28, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 28, Layer: 802.11, BCAST pkts sent to chanl: 4

Node: 28, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 28, Layer: 802.11, BCAST pkts rcvd clearly: 58

Node: 28, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 28, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 28, Layer: 802.11, pkt drops due to retx limit: 0

Node: 28, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 28, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 28, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 4

Node: 28, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 28, Layer: NetworkIp, Number of Packets Delivered To this Node: 58

Node: 28, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 3654

Node: 28, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 28, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 28, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 28, Layer: TransportUdp, Number of pkts from application 4.

Node: 28, Layer: TransportUdp, Number of pkts to application 58.

Node: 28, Layer: RoutingWrp, Number of routing packets sent = 4

Node: 28, Layer: RoutingWrp, Number of routing packets recvd = 58

Node: 29, Layer: RadioAccnoise, Signals transmitted: 3

Node: 29, Layer: RadioAccnoise, Signals arrived with power above RX sensitivity: 228

Node: 29, Layer: RadioAccnoise, Signals arrived with power above RX threshold: 228

Node: 29, Layer: RadioAccnoise, Signals received and forwarded to MAC: 193

Node: 29, Layer: RadioAccnoise, Collisions: 18

Node: 29, Layer: RadioAccnoise, Energy consumption (in mWhr): 0.750

Node: 29, Layer: 802.11, pkts from network: 0

Node: 29, Layer: 802.11, UCAST (non-frag) pkts sent to chanl: 0

Node: 29, Layer: 802.11, BCAST pkts sent to chanl: 3

Node: 29, Layer: 802.11, UCAST pkts rcvd clearly: 0

Node: 29, Layer: 802.11, BCAST pkts rcvd clearly: 40

Node: 29, Layer: 802.11, retx pkts due to CTS timeout: 0

Node: 29, Layer: 802.11, retx pkts due to ACK timeout: 0

Node: 29, Layer: 802.11, pkt drops due to retx limit: 0

Node: 29, Layer: 802.11, RTS Packets ignored due to Busy Channel 0

Node: 29, Layer: 802.11, RTS Packets ignored due to NAV 0

Node: 29, Layer: NetworkIp, Number of Packet Attepted to be Sent to MAC: 3

Node: 29, Layer: NetworkIp, Number of Packets Routed For Another Node: 0

Node: 29, Layer: NetworkIp, Number of Packets Delivered To this Node: 40

Node: 29, Layer: NetworkIp, Total of the TTL's of Delivered Packets: 2520

Node: 29, Layer: NetworkIp, Average Hop Count Assuming 64 Inital TTL 1.000000

Node: 29, Layer: NetworkIp, Number Fragments dropped because Node was Unreachable: 0

Node: 29, Layer: NetworkIp, Number Fragments dropped because TTL expired: 0

Node: 29, Layer: TransportUdp, Number of pkts from application 3.

Node: 29, Layer: TransportUdp, Number of pkts to application 40.

Node: 29, Layer: RoutingWrp, Number of routing packets sent = 3

Node: 29, Layer: RoutingWrp, Number of routing packets recvd = 40