**Vector Timestamp Behavior**

Probably the most interesting behavior noticed with vector timestamps is how certain nodes or groups of nodes will become “isolated” for long periods of time depending on the simulation parameters. This mainly happens with EMR and HDS nodes where they are unaware of the timestamps of any other nodes until an outbreak occurs. This is because outside of an outbreak notification, these nodes receive messages exclusively from one another.

DOA nodes also exhibit similar behavior, but they are only unaware of the other DOA nodes until they outbreak. Since the DOA nodes effectively act as sinks for most messages going through the system, they are generally the most up to date with the newest vector timestamp.

The counts within the vector also give a good indication of what has been going on within the system. For example, a DOA node with a high logical clock value indicates that it has received a large number of disease notifications and may be more likely to have reported an outbreak (depending on the threshold parameters). The clock value for an HDS node may also reveal how many EMR nodes it is connected to relative to other HDS nodes. Those with higher values see more traffic from EMR requests for disease outbreaks.

All EMR nodes also have generally similar clock values since they work independently with the same parameters and each communicates with exactly one other node.