Network Virtualization Project 1 Report

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Many Thanks to Andreea Anghel

Introduction of the Protocol:

The protocol is document-like, which means all the request and response in the network is text-based and will be parsed at each node. The Coordinator node will broadcast the list to every member in the node when anything changes in the network. The member node will update the local list of nodes in the list according to the 'LIST' message sent by the Coordinator node.

Messages of the Protocol:

There are following messages that are exchanged by all the nodes in the network:

"Coordinator Lookup":

Send at the bootstrapping phrase. If no response from other, the node will consider itself as the coordinator.

If the message is received by running node, the current coordinator name will be replied.

"JOIN "+hostname

Send by the new coming node after the coordinator name is received, and directly sent to the coordinator.

Received by the coordinator. The coordinator will update the current node list and broadcast the new list to all the members.

"**LEAVE "+hostname:**

Send by the node that is going to leave the network. Directly sent to the coordinator.

Received by the coordinator. The coordinator will update the current node list and broadcast the new list to all the members.

"LIST "+all hostnames in the network

Send by the Coordinator node to all the other nodes.

"PING "+Coordinator name

Sent by the Coordinator to the members. If no "PONG" message is received after a certain ping pong timeout, the member node is considered as failure, and will be removed from the node list. New list will be broadcast.

"Pong "

Sent by the member node after receive the "PING" message to the coordinator

"LATENCY "+latency message:

sent by the member node after receive the "PING" message. The member node will first ping another node in the network, and update the new average ping RTT time. The new update latency message will sent to the coordinator

Coordinator re-election:

Since all the lists of every node in the network are same, when the Coordinator Failure is detected (No PING message after PINGTIMEOUT), the coordinator name is removed from the list, and we simply pick the first name on the list as the next coordinator. The new coordinator and

other members will refresh the list, and non-coordinator will resend the JOIN message to the new coordinator.