BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI (RAJASTHAN)
I SEMESTER 2022-2023
ASSIGNMENT-2

Course No.:	IS F462	**Course Title:**	Network Prog.
Due Date:	As per Canvas	**Maximum Marks:**	60 (15%)

Note:
- Maximum two students per group.
- Upload code in Canvas. Name your file idno1_idno2_assignment1.tar .

P1. We have studied that System V Message queues can be used to send messages to different processes within OS. Let us consider implementing a similar mechanism called Network Message Bus (NMB) on a LAN using UDP sockets and System V Message Queues. Following are the characteristics of this bus.
- in NMB, processes can send messages to other processes residing in any operating system on the network.
- Any process can use NMB through the following API. Type of message is formed by ip address (higher 4 bytes) and port no (lower 2 bytes). Use network byte-order.
    - o msgget_nmb() similar to msgget(). Assume that there is only one message bus in the network.
    - o msgsnd_nmb() similat to msgsnd()
    - o msgrcv_nmb() similar to msgrcv()
- When a process uses above API, the messages are sent to a local unix domain server (running at /usr/tmp/1111) through Unix Domain Datagram sockets. There can be several processes sending messages to local server at a time.
- There is one specific process "error" in the system which finds out network error messages by reading ICMP messages. If the error message is HOST UNREACHABLE or NETWOPRK UNREACHABLE, this process sends a message with {destination ip address and error} to local server.
- Local server uses UDP socket to send messages received from local processes to all in the network on port 1112 using multicast.
- When a local server receives messages on UDP socket from other processes, it accepts only those messages which are meant for its IP address or if it is a error message. If the process bound on that port is up, it will deliver it on the Unix domain socket, otherwise it is delivered whenever a process connects with source port number matching the port no in the message type. Error messages are delivered to the "error" process. Error process displays messages (both its own and those received through multicast) on the console with details.

Implement the API specified in the above requirements in file *nmb.c* . Implement local server in file *local_server*.c. Implement error process in error.c.

Deliverables:
- nmb.c, error.c, local_server.c, driver.c
- PDF file explaining the design.

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