Design Document for Assignment 3

- Inetd is a super server. It runs multiple servers as specified in inetd.conf file.
- A global data structure, an array of struct mapper, is created by reading from the files /etc/services and inetd.conf. It maps socket fd to service name. It also contains information regarding whether the socket is udp or tcp, whether the mode is wait or no wait mode, username, group name, port, and path to the executable along with command line arguments.
- Initially the process is made a daemon process by following a series of steps as mentioned in R1 The Linux Programming Handbook section 37.2.
- Initially it creates sockets, binds them to port numbers, and listens on them (in case of TCP). Sockets are added to a file descriptor set and select() is called on them in an infinite while loop.
- If incoming connection is on TCP socket, it is accepted, and depending on wait/no wait mode, listen fd is retained in/removed from master set.
- In case of incoming connection on UDP socket, there is no need to accept.
- A child process is forked by daemon to handle the incoming connection. The child duplicates its file descriptors 0, 1, 2 to the socket fd (connfd in case of TCP), calls setuid() and setgid() if user specified in inetd.conf is not root, and then an execv() call is performed.
- Signal handler is used to handle the SIGCHLD signal. In this, waitpid is called and, if wait mode was specified, socket fd in case of UDP and listenfd in case of TCP is added back into the master file descriptor set.