ESP CSE 598
Name: Uma S Kulkarni
ASU ID: 1207684864

ASSIGNMENT- 2 REPORT

A] Accept calls from multiple users:

As currently we are testing the i2c driver on a single user thread , no contention is occurring. But to extend the functionality of driver to make it compatible with multiple user threads we will have to avoid the contention in multiple threads by locking mechanism. This can be done by locking the critical sections of driver program using a mutex. Mutual exclusion (mutex) guard against multiple threads modifying the same shared data simultaneously. Read, write and ioctl functions (including the work queue functions) need to be locked because these are the only sections of code where data corruption can occur . This can also be achieved using spin locks where the thread will not go into blocking state but will “do nothing” until the lock is unlocked.

In case of blocking mode, read/write system calls will be blocked for the period when one of the thread is operating on it.

B] Working on a different EEPROM chip:

Each i2c device will have hardware adapter which in turn will communicate with specific adapter in kernel. Hence, different EEPROM chip will have its own i2c adapter which corresponds to the i2c_dev structure in the current program. Same code can be used for creating different i2c adapters. For different EEPROM, slave address will change accordingly. Also number of pages and page of the EEPROM will be different. Accordingly, each page size will be modified in read, write and ioctl system calls. Given EEPROM contains 512 pages of 64 bytes each.

And accordingly the correct page addresses should be used by modifying the add_calc( ) function. For eg2- While wrapping the page offset around from the last page again to first page of EEPROM while reading or writing, we need to know the total number of pages in the EEPROM. Which in current case is 512 pages. This can be generalized by including the number of pages and page size variables in the client structure itself , so that whenever user calls a function on a different client the read, write,ioctl functions will know the details of corresponding EEPROM .

Two or more EEPROMs can be attached modifying i2c adapter function.