

**Operating Systems**

**Formal Element: Reader-Writer Problem**

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# Introduction

The readers preference describes the solution that disallows two threads to access a resource regardless of their intention, this is done using a mutex (binary semaphore) this prevents one thread from accessing a resource while another is using it. This solution works fine if the threads are writing but is limited in that if two readers are accessing the resource (text file), one is locked out, reading having no effect on the contents of the file should not be blocked. The first reader-writer problem attempts to solve this.

The solution for above leaves another problem and that is with the order of access for the writers. Suppose a reader has access to a resource and a writer is in the queue for writing to it, according to the readers preference, another reader gets priority over the writer, allowing the second reader to jump ahead of the writer and lock the resource. The next reader-writer solution is to ensure that no writer is made wait longer than necessary. This is solved using a reader-try mutex, when a reader attempts to read the file it must lock and release this mutex

The above solutions are implemented using semaphores in the Linux environment, to gain access to a file a lock must be made on that resource mutex, to release the resource to another reader/writer, an unlock must be made.

# Readers Preference

# Writers Preference

# Conclusion

# References

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