

Lecture Assignment 3

Due date: 26-30-2023

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Select two questions based on your preference!

Is it possible to share an IRQ with multiple devices? Explain your answer.

Yes, it is possible to share an IRQ with multiple devices in certain situations and with the appropriate hardware and software support. For example, newer computers have hardware controllers like IO-APIC and MSI to assign devices to share the same IRQ. Moreover, it is also possible to have devices on the same IRQ with software device drivers.

Compare static vs. dynamic linking of library routines.

Static Linking combines object code or compiled code from multiple source files into a single executable file at compile-time. When you statically link a program, all the necessary library code and dependencies are included directly in the final executable.

Pros

- Portable (does not rely on external libraries)
- Consistent (uses a specific version of libraries which is known at compile time)
- Security (less vulnerable to library version issues or library tampering)

Cons

- Larger Size (Self-explanatory)
- Inflexibility (changes require recompiling the entire program again)
- Wasted Space (can be redundant if multiple programs link to the same library)

Dynamic Linking is a method that loads shared objects or libraries into a program's memory during runtime. Furthermore, rather than loading at compile time, this method enables a program to use external libraries or code modules without having those libraries included in the program's executable file.

Pros

- Efficient Memory Usage (unlike static it uses the original library rather than making another one)
- Runtime Flexibility (managing dependencies and resources is easier since libraries can be loaded and unloaded during runtime)
- Updatability (only the shared library file needs to be updated, and the rest of the files are updated automatically)

Cons

- Dependencies (If a required library is missing or incompatible, it can lead to runtime errors)
- Version Issues (different versions of shared libraries can be a concern, potentially leading to issues)
- Bad Security (introduces risk if malicious or compromised libraries are loaded at runtime)