SNS COLLEGE OF TECHNOLOGY

Coimbatore-35.
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COURSE NAME : 23CST202 – OPERATING SYSTEMS

II YEAR/ IV SEMESTER

UNIT – III STORAGE MANAGEMENT

Topic: Memory Management

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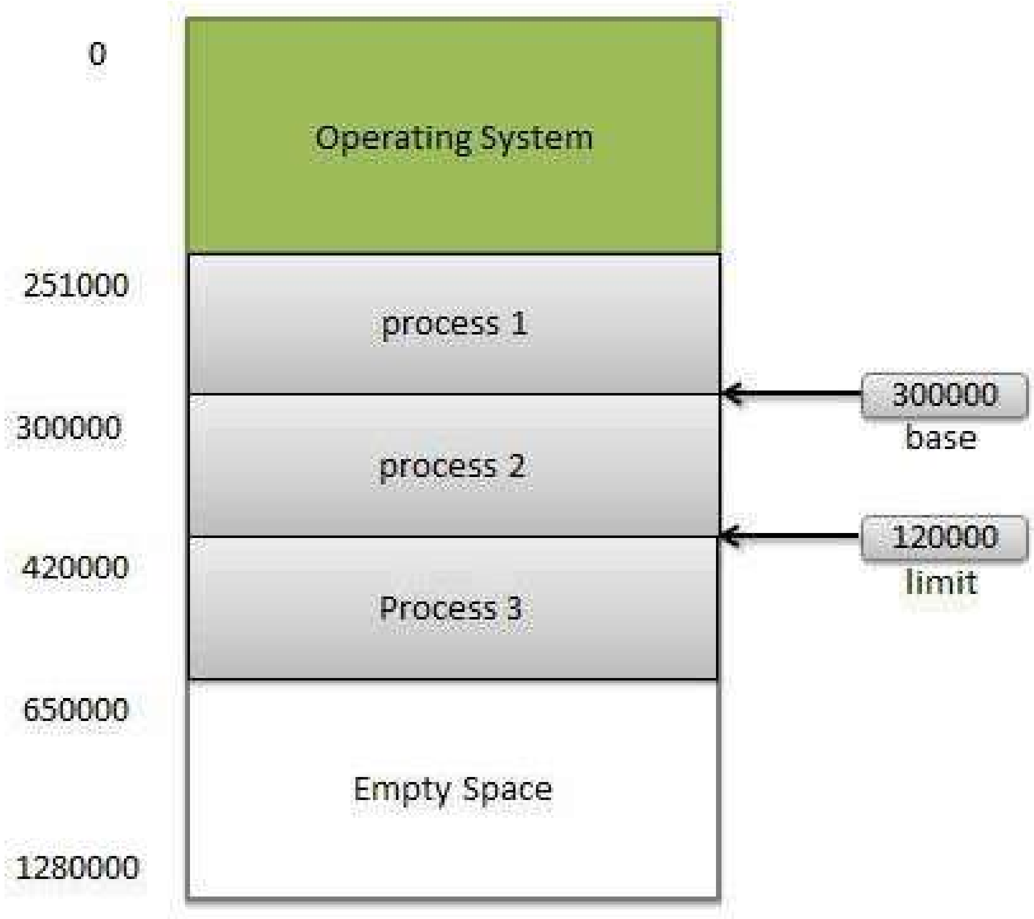
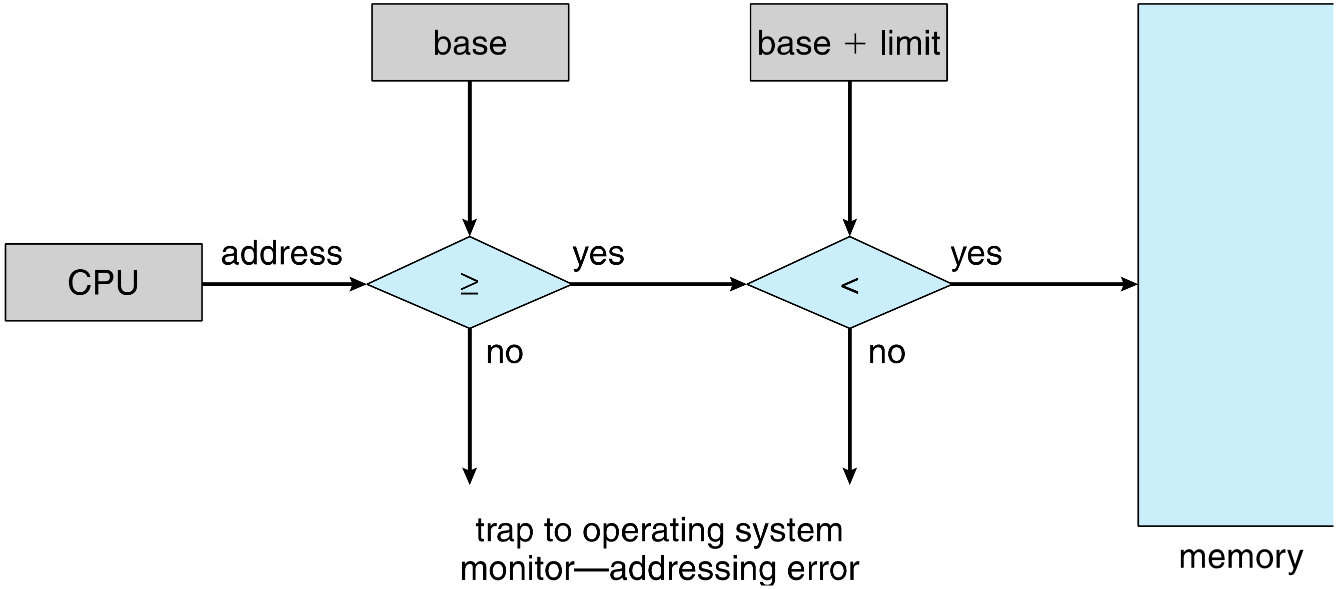
Background -Base and Limit Registers



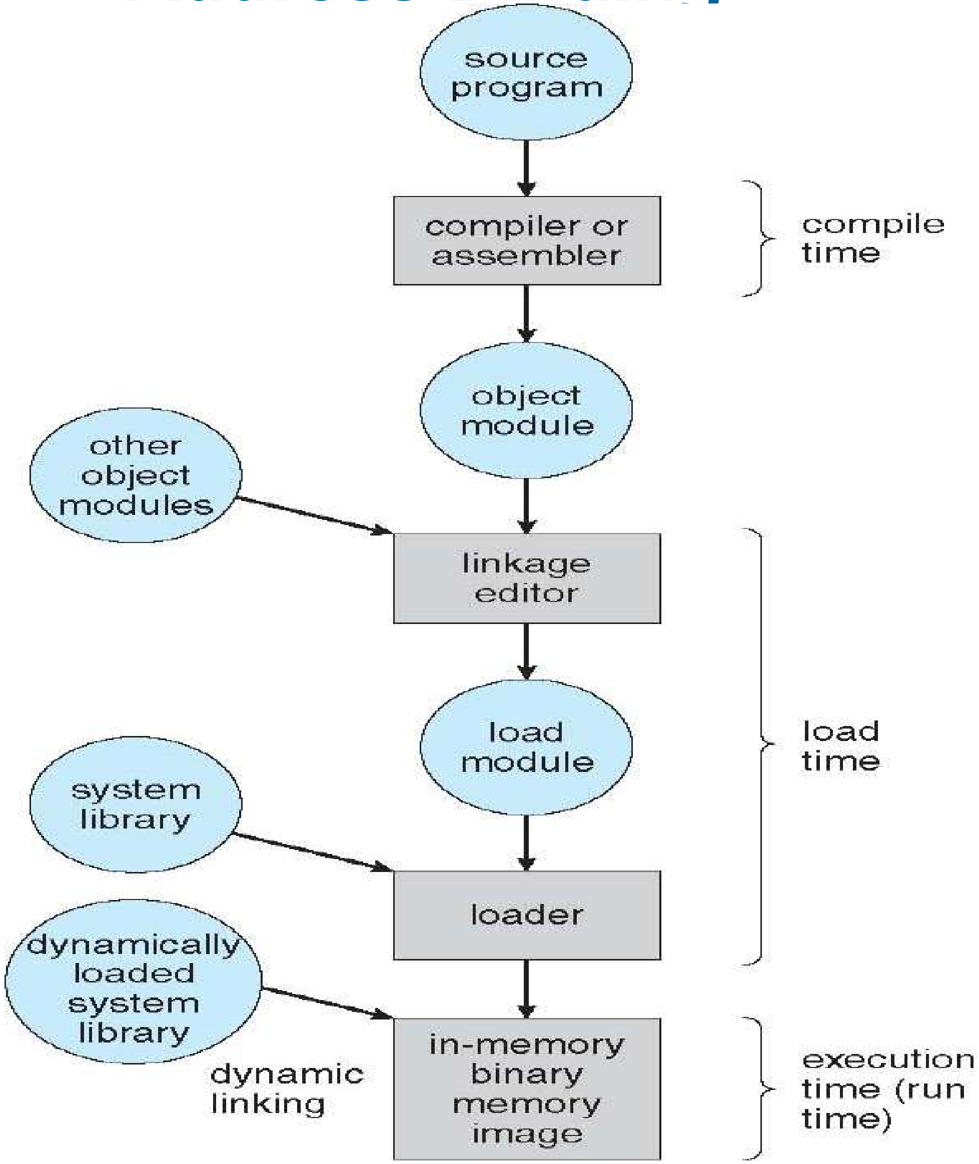
Hardware Address Protection



Address Binding

- **Compile time**: If memory location known a priori, **absolute code** can be generated; must recompile code if starting location changes
- **Load time**: Must generate **relocatable code** if memory location is not known at compile time
- **Execution time**: Binding delayed until run time if the process can be moved during its execution from one memory segment to another
  - Need hardware support for address maps (e.g., base and limit registers)

Address Binding



Logical vs. Physical Address Space

- **Logical address** – generated by the CPU; also referred to as **virtual address**
- **Physical address** – address seen by the memory unit

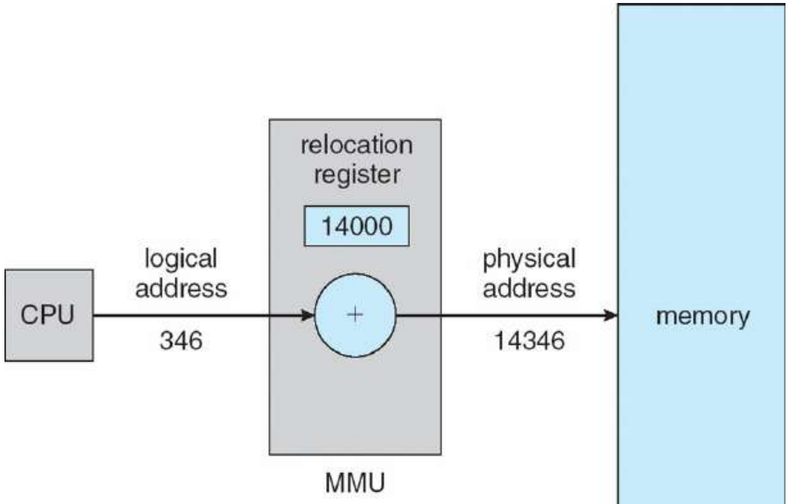
- Logical and physical addresses are the same in **compile-time** and **load-time address-binding schemes**; logical (virtual) and physical addresses differ in **execution-time address-binding scheme**
- **Logical address space** is the set of all logical addresses generated by a program
- **Physical address space** is the set of all physical addresses generated by a program

Memory-Management Unit (MMU)

- To start, consider simple scheme where the value in the relocation register is added to every address generated by a user process at the time it is sent to memory
  - Base register now called **relocation register**

Dynamic relocation using a relocation register

- Routine is not loaded until it is called
- Better memory-space utilization; unused routine is never loaded
- All routines kept on disk in relocatable load format
- Useful when large amounts of code are needed to handle infrequently occurring cases
- No special support from the operating system is required
- Implemented through program design
- OS can help by providing libraries to implement dynamic loading



Dynamic Linking &Loading

- Dynamic linking –linking postponed until execution time
- Dynamic linking is particularly useful for libraries