

Advance Intel Processor Architecture and Programming (AIPAP)

Course Objective

This course introduces advanced features of 80386 microprocessor operating in protected mode. This includes the study of Boot Sequence, Memory Management, Task Management support provided by Intel 80386. Knowledge of 80386 helps a lot in thorough understanding of any Operating System. This course prepares a strong foundation for System/ Kernel Programmers.

Course Content

Microprocessor Fundamentals

Overview of Intel Processors
Notation Conventions
Real Mode/ Protected mode/ V86 Mode
Memory Segmentation

Memory Management

Segmented Model
Physical Address/Logical Address/ Linear Address
Segment Aliasing, overlapping

Privilege Levels

Privilege Protection
Defining Privilege Levels
Changing Privilege Levels 96
Defensive Programming

Protected Mode-Memory Management

Paging
Virtual Memory
Address Translation
Page Directory Entry, Page Table Entry
Page level protection
Translation Look Aside Buffer (TLB Cache)

Protection

Segment Level Protection
Page Level Protection
DPL/ CPL/ RPL
Conforming/ Non Conforming Code Segments
Call Gates

Multitasking

Task State Segments
Task Scheduling
Task Linking
TSS

Interrupts & Exception Handling

Sources and Types of Interrupt
Interrupt/ Fault/ Exception
IDT – IDTR
Interrupt Handling Procedures
Halt & Shutdown

Inside Boot Sequence

Reference:

Intel Architecture Software Developer's Manual
Volume 3: System Programming

Advanced 80386 Programming Techniques
James L. Turley

Prerequisite:

Familiarity with basic concepts of assembly programming.