

Monitors

Chapter Seven

Outline

- Monitors
- Software monitors
- Hardware monitors

Monitors

- A **monitor** is a tool used to observe the activities on a system
- Useful for:
 - Software optimization
 - Finding bottlenecks
 - Tuning
 - Characterizing workloads

Definitions

- **Event** is a change in the system state
- **Trace** is a log of events usually including event times
- Monitors often have overheads

Monitor types

- Triggers
 - Event driven: good for infrequent events
 - Timer driven (sampling): good for frequent events
- Results displaying
 - Online
 - Batch
- Implementation
 - Software, hardware, firmware, hybrid

Software monitors

- Activation mechanism:
 - Trap instruction
 - Trace mode; interrupt after every instruction
 - Timer interrupt (resolution problem)

Hardware monitors

- Probes
- Counters
- Timers
- Logic analyzers

Comparison

Criterion	Hardware monitor	Software monitor
Domain	HW events	Application and OS events
Input rate	High	Low
Time resolution	High	Low
Overhead	None	Varies