SNS COLLEGE OF TECHNOLOGY

**(Autonomous)**

COIMBATORE-35

STREAMS AND PERFORMANCE

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- **STREAM** – a full-duplex communication channel between a user-level process and a device in Unix System V and beyond

- A STREAM consists of:
  - STREAM head interfaces with the user process
  - driver end interfaces with the device
  - zero or more STREAM modules between them

- Each module contains a **read queue** and a **write queue**

- Message passing is used to communicate between queues
  - **Flow control** option to indicate available or busy

- Asynchronous internally, synchronous where user process communicates with stream head

The STREAMS Structure
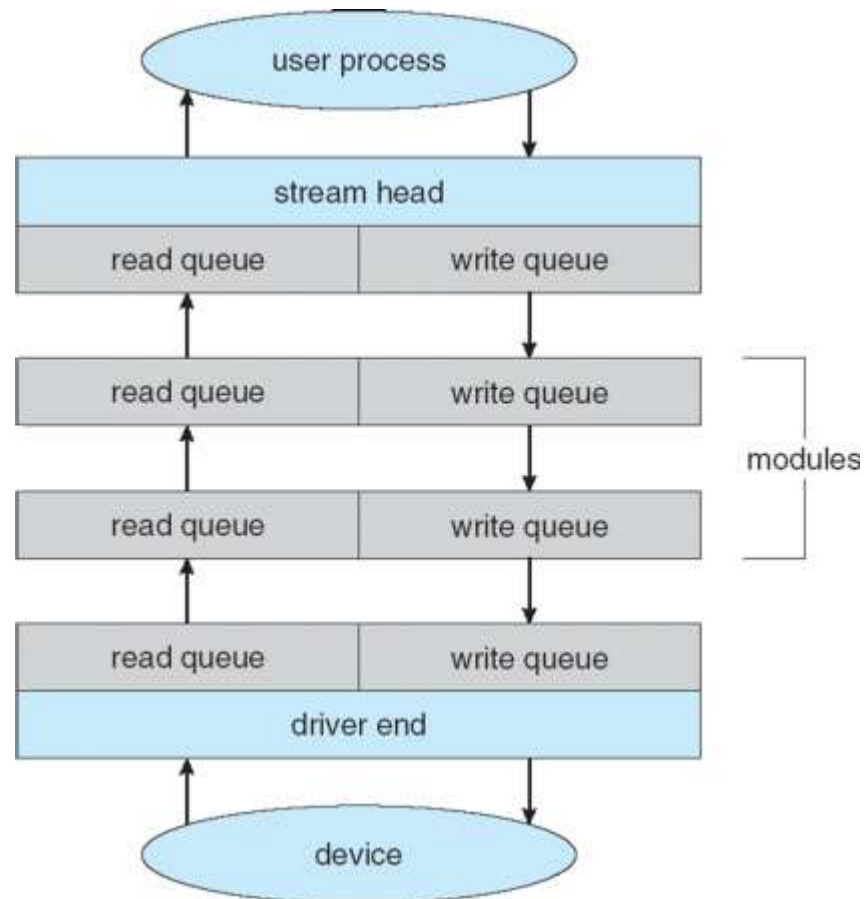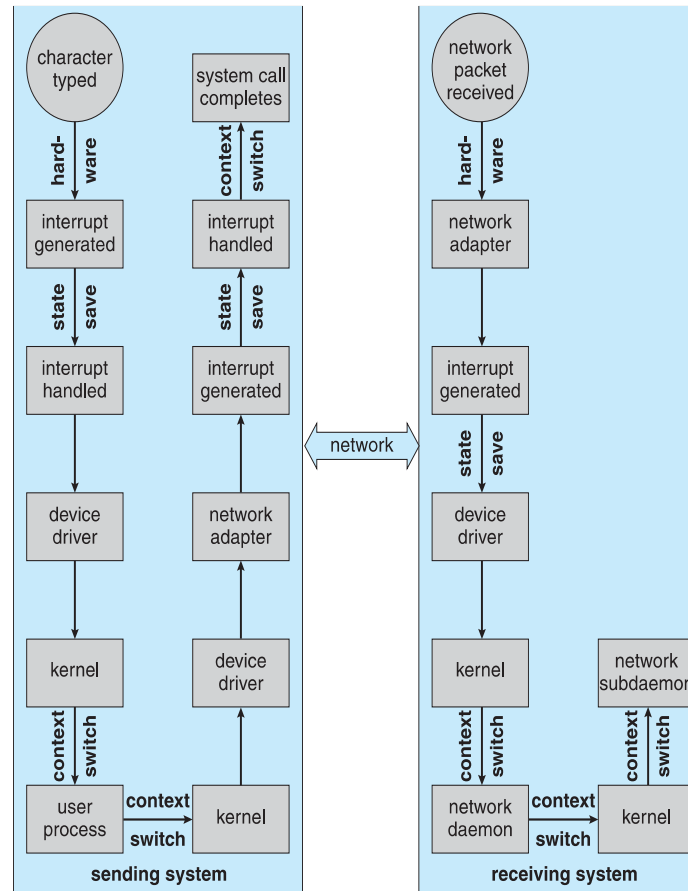
STREAMS AND PERFORMANCE

Performance

- I/O a major factor in system performance:
  - Demands CPU to execute device driver, kernel I/O code
  - Context switches due to interrupts
  - Data copying
  - Network traffic especially stressful

Intercomputer CommunicationsI/O

Improving Performance

- Reduce number of context switches

- Reduce data copying

- Reduce interrupts by using large transfers, smart controllers, polling

- Use DMA

- Use smarter hardware devices

- Balance CPU, memory, bus, and I/O performance for highest throughput

- Move user-mode processes / daemons to kernel threads

References

1. Silberschatz, Galvin, and Gagne, "Operating System Concepts", Ninth Edition, Wiley India Pvt Ltd, 2009.

2 .   Andrew S. Tanenbaum, "Modern Operating Systems", Fourth Edition,   Pearson Education, 2010.

Summarization