ECAP615

Programming in Java

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Learning Outcomes

After this lecture, you will be able to

- understand the various states in the life cycle of a thread.
- learn the various methods of implementing thread states.

Life Cycle of Thread

A thread in Java at any point of time exists in any one of the following states. A thread lies only in one of the shown states at any instant:

- New
- Runnable
- Blocked
- Waiting
- Timed Waiting
- Terminated

New Thread

- When a new thread is created, it is in the new state.
- The thread has not yet started to run when thread is in this state.
- When a thread lies in the new state, it's code is yet to be run and hasn't started to execute.

Runnable State

- A thread that is ready to run is moved to runnable state.
- In this state, a thread might actually be running or it might be ready run at any instant of time.
- It is the responsibility of the thread scheduler to give the thread, time to run.

Blocked/Waiting state

When a thread is temporarily inactive, then it's in one of the following states:

Blocked

Waiting

Timed Waiting

- A thread lies in timed waiting state when it calls a method with a time out parameter.
- A thread lies in this state until the timeout is completed or until a notification is received.

Terminated State

A thread terminates because of either of the following reasons:

- Because it exists normally.
- This happens when the code of thread has entirely executed by the program.
- Because there occurred some unusual erroneous event, like segmentation fault or an unhandled exception.

Implementing Thread States

- In Java, to get the current state of the thread, use Thread.getState() method to get the current state of the thread.
- Java provides java.lang.Thread.State class that defines the ENUM constants for the state of a thread.

1. Constant type: New

Declaration:

public static final Thread.State NEW

Implementing Thread States

2. Constant type: Runnable

Declaration:

public static final Thread.State RUNNABLE

3. Constant type: Blocked

Declaration:

public static final Thread.State BLOCKED

Implementing Thread States

4. Constant type: Waiting

Declaration:

public static final Thread.State WAITING

5. Constant type: Timed Waiting

Declaration:

public static final Thread.State TIMED_WAITING

Implementing Thread States

6. Constant type: Terminated

Declaration:

public static final Thread.State TERMINATED


That’s all for now…