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CMSC436: Programming Handheld Systems
Alarms
Today’s Topics

Alarms
AlarmManager APIs
Alarm Types
Example Application
Alarms

Mechanism for sending Intents at some point in the future

Allows one application to make code execute, even when that application is no longer running
Alarms

Once registered, Alarms remain active even if the device is asleep
Can configure Alarms to wake a sleeping device
Alarms are canceled on device shutdown/restart
Alarm Examples

MMS - Retry Scheduler
Settings - Bluetooth Discoverable timeout
Phone - User Info Cache
You create and manage Alarms by interacting with the AlarmManager.

Get a reference to the AlarmManager, e.g., by calling the Context class’ `getSystemService(Context.ALARM_SERVICE)`
Creating Alarms

// One-shot Alarm with inexact timing. If there is already an alarm
// scheduled for the same IntentSender, that previous alarm will first
// be canceled

open fun set(type: Int, triggerAtMillis: Long,
    operation: PendingIntent!): Unit
Creating Alarms

// One-shot Alarm with exact timing

open fun setExact(type: Int, triggerAtMillis: Long,
operation: PendingIntent!): Unit

On newer API versions, this method generally requires the SCHEDULE_EXACT_ALARM permission
Creating Alarms

// Repeating alarm with inexact timing

open fun setRepeating(type: Int, triggerAtMillis: Long,
                      intervalMillis: Long, operation: PendingIntent!): Unit
Alarm Types

Two degrees of configurability

How to interpret time

What to do if the device is sleeping when the Alarm fires
Interpreting Time

Realtime - relative to system clock
Elapsed - relative to time since last boot up
Sleeping Devices

When Alarm fires and device is asleep, can either

Wake up device now & deliver Intent
Wait to deliver Intent until device wakes up
Alarm Type Constants

RTC_WAKEUP
RTC
ELAPSED_REALTIME
ELAPSED_REALTIME_WAKEUP
PendingIntent

A description of an Intent and a target action to perform with it
Can be handed to other applications so that they can perform actions on your behalf at a later time

Key concern - proxy applications shouldn’t perform operations that originating application can’t
PendingIntent


AlarmCreate

SET SINGLE ALARM
SET REPEATING ALARM
CANCEL REPEATING ALARM

SET SINGLE ALARM
SET REPEATING ALARM
CANCEL REPEATING ALARM

A Kind Reminder 🌟
Get back to studying!!
Next Time

Threads, Messages and Handlers
Example Applications

AlarmCreate