APPLICATION LIFECYCLE

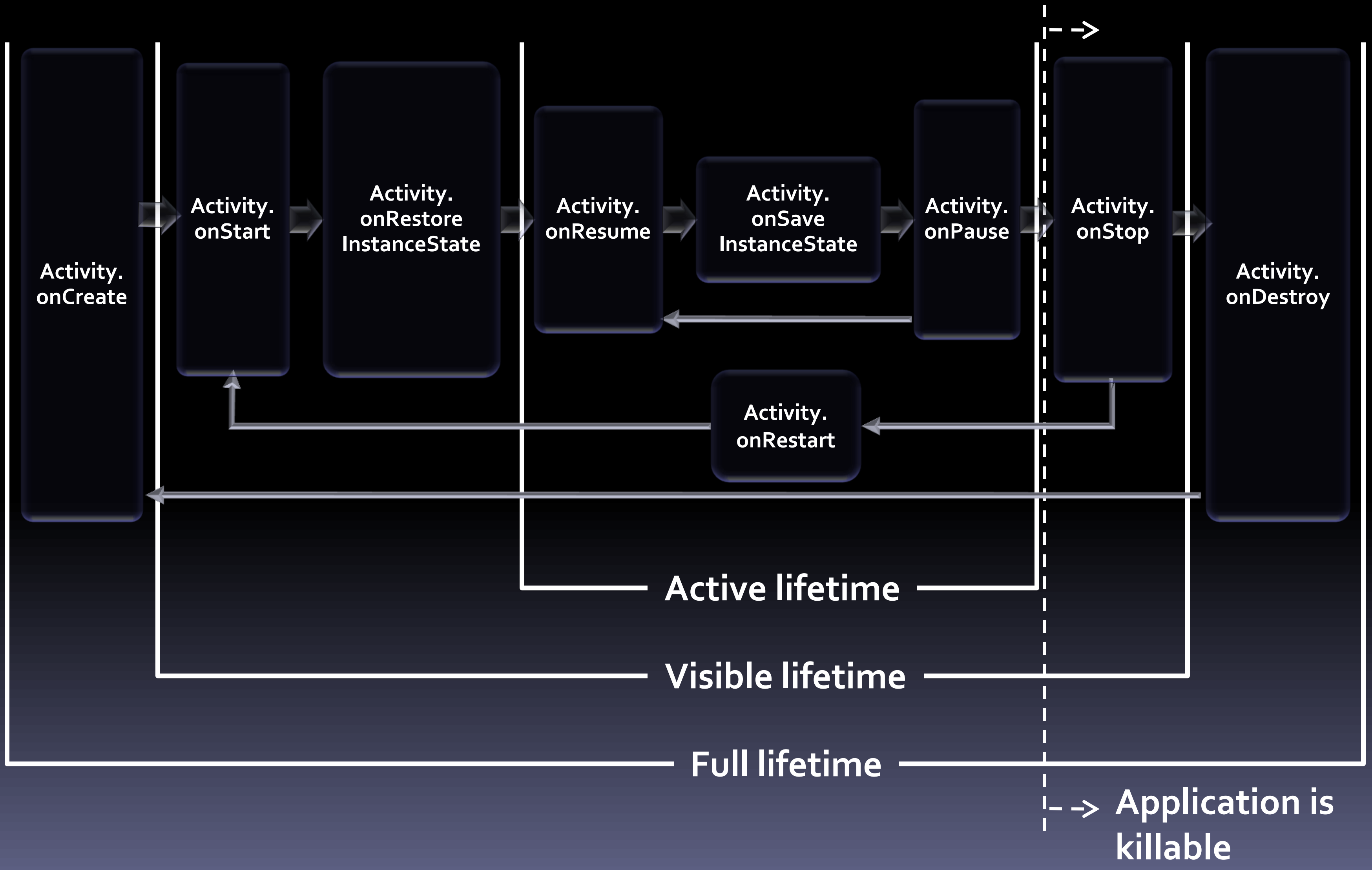
Application lifecycles

- Applications and processes may transition between several states
    - active
    - paused
    - stopped
    - inactive
    - suspended
- Callback methods allow applications to prepare for and respond to transitions

Android lifecycle methods

- Lifecycle state transitions trigger event callback methods
- Callback events differ based on type of component
- Callback methods take place in foreground and should be brief

Android Activity

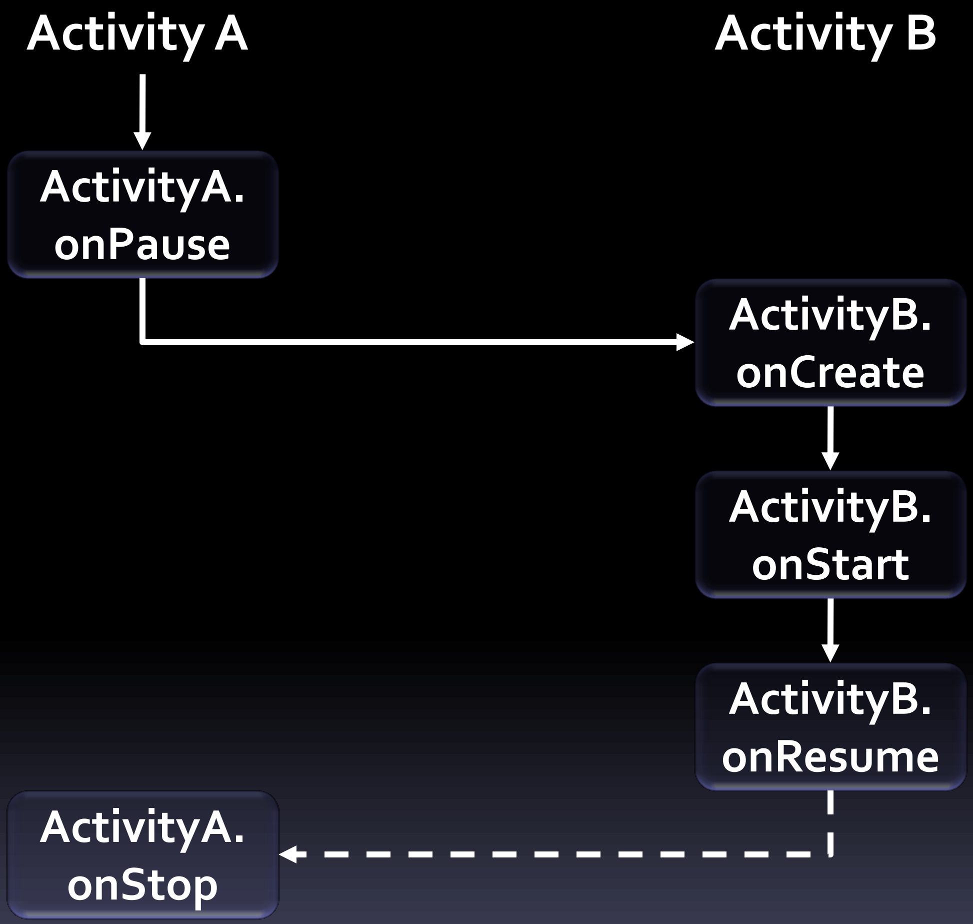


Activity callback methods

- Implementation of lifecycle method should always first call superclass

```
protected void onPause() {
    super.onPause();
    . . .
}
```

Activity transition



Activity A

Activity B

ActivityA.
onPause

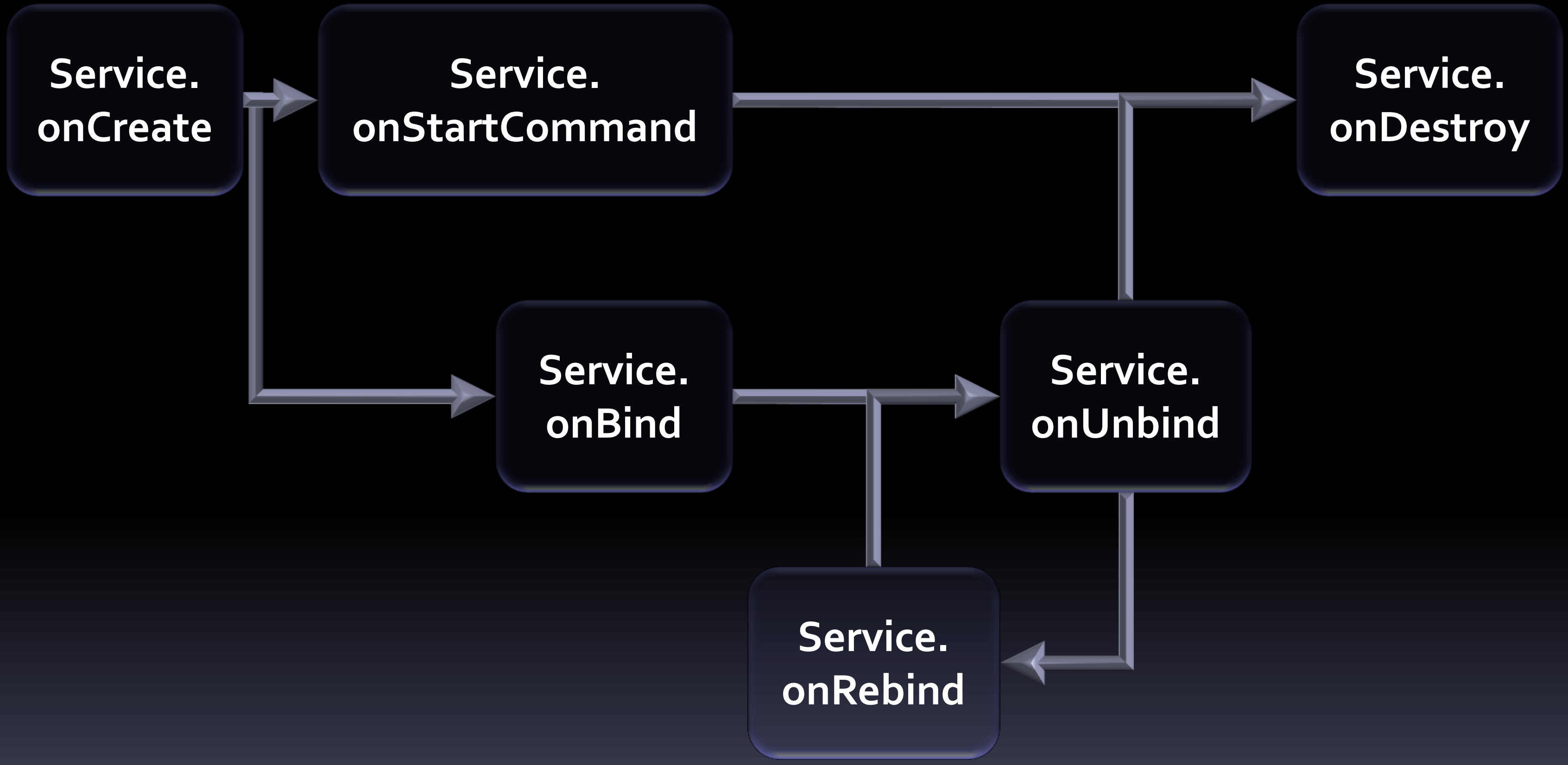
ActivityB.
onCreate

ActivityB.
onStart

ActivityB.
onResume

ActivityA.
onStop

Android Service



Service. onCreate

Service. onStartCommand

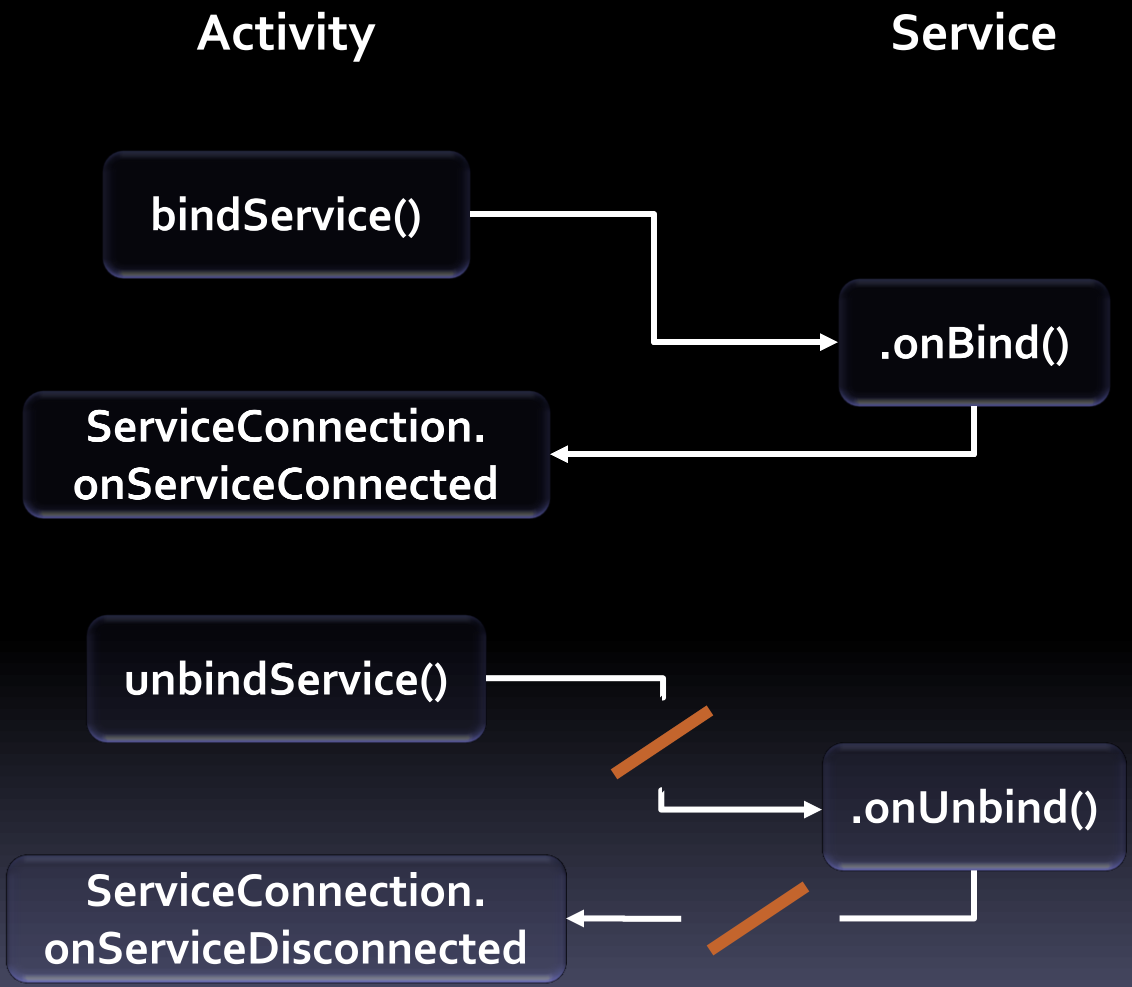
Service. onDestroy

Service. onBind

Service. onUnbind

Service. onRebind

Service binding methods



Activity

Service

bindService()

.onBind()

ServiceConnection.
onServiceConnected

unbindService()

.onUnbind()

ServiceConnection.
onServiceDisconnected

Android BroadcastReceiver

BroadcastReceiver.
onReceive

- Only active while handling onReceive() method

Android ContentProvider

ContentProvider.
onCreate

- Only active while handling methods supporting ContentResolver
  - query()
  - insert()
  - update()
  - delete()
  - getType()

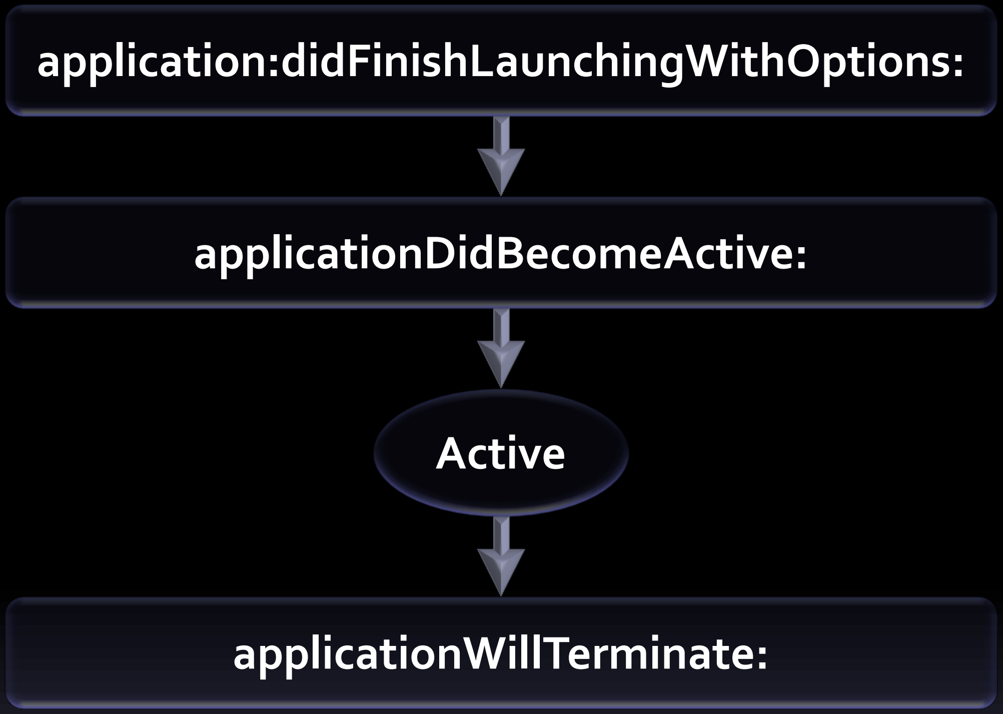
Processes and lifecycles

- Old processes removed when memory runs low
- Selection base on *importance hierarchy*
  1. Foreground process
  2. Visible process
  3. Service process
  4. Background process
  5. Empty process

iOS Application lifecycle

- UIApplication notified of state transition events
  - Handled by application delegate
    - application:didFinishLaunchingWithOptions:
    - applicationDidBecomeActive:
    - applicationWillResignActive:
    - applicationDidEnterBackground:
    - applicationWillEnterForeground:
    - applicationWillTerminate:

Pre – iOS 4



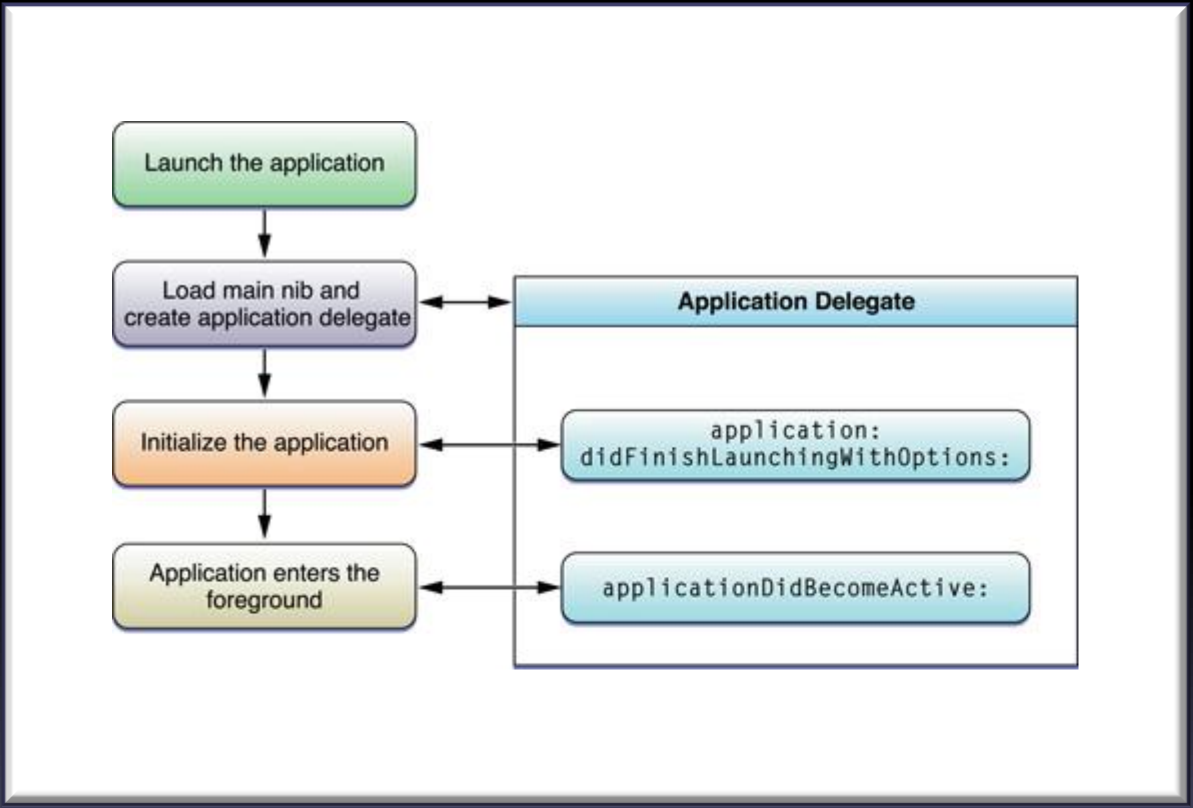
application:didFinishLaunchingWithOptions:

applicationDidBecomeActive:

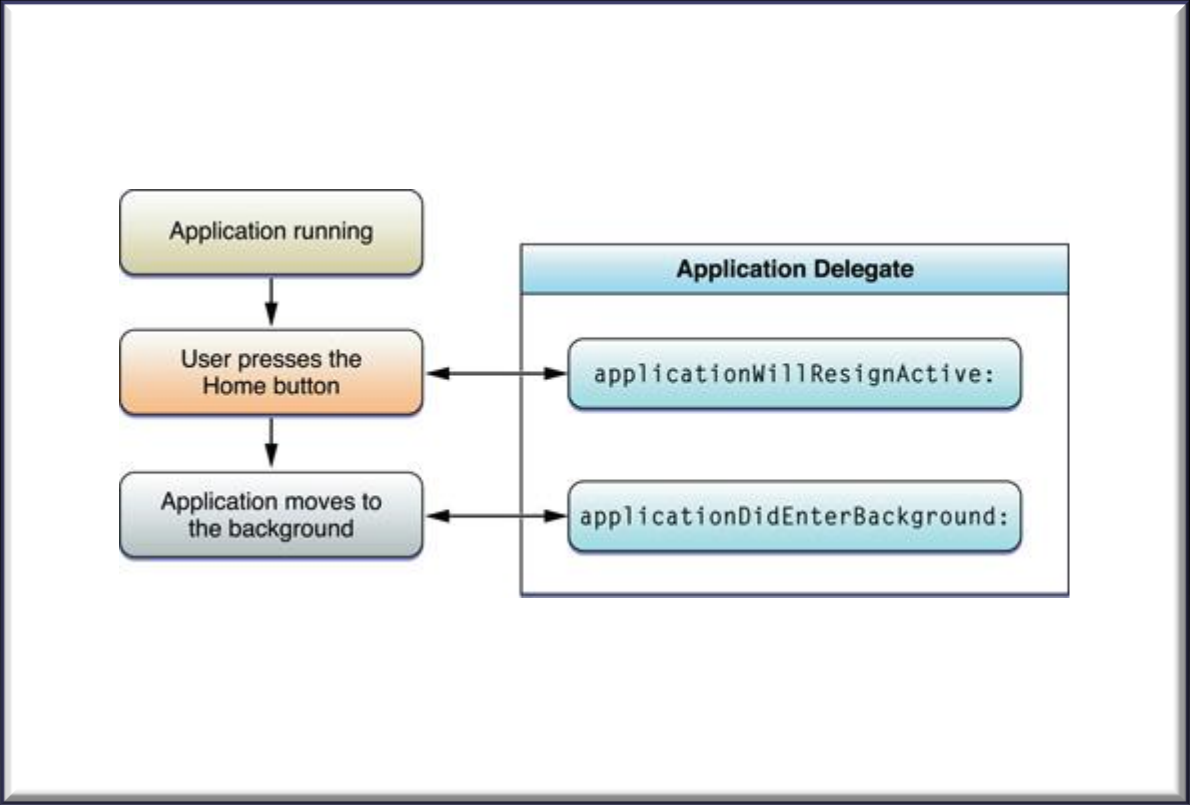
Active

applicationWillTerminate:

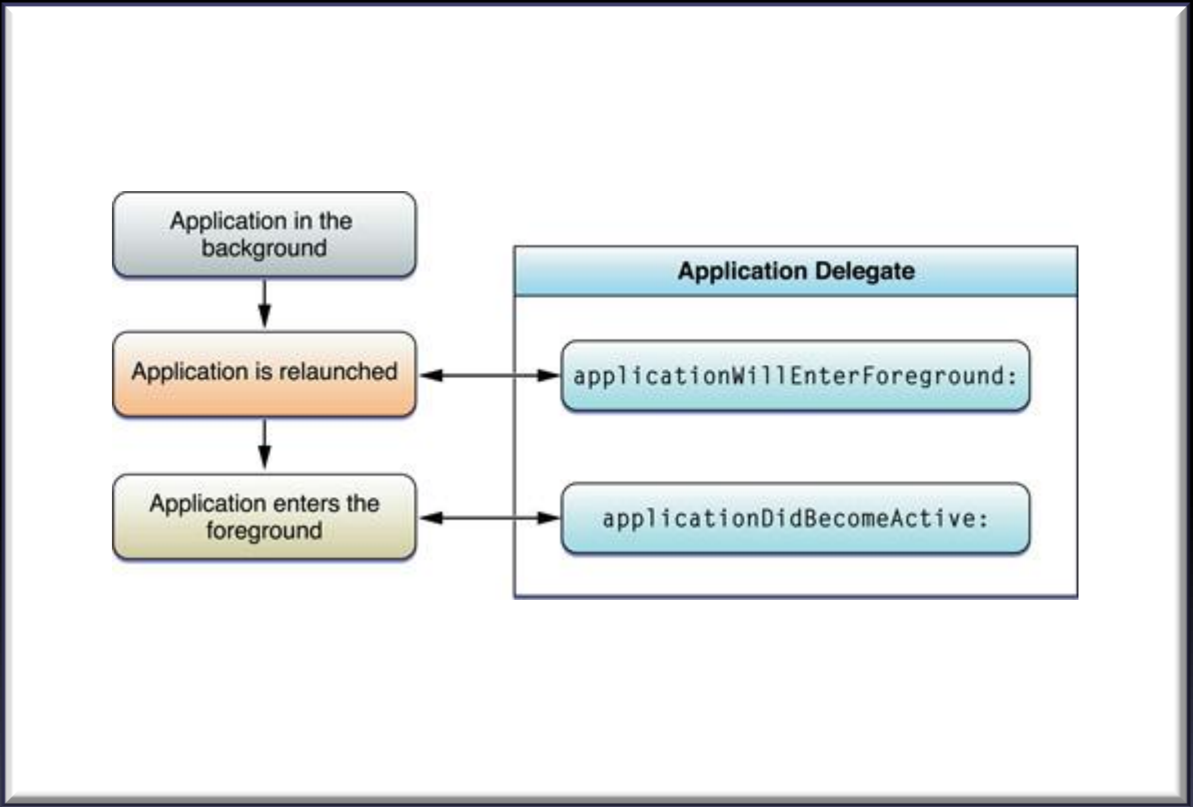
iOS Application launch


Launch the application
Load main nib and create application delegate
Initialize the application
Application enters the foreground
Application Delegate
application: didFinishLaunchingWithOptions:
applicationDidBecomeActive:

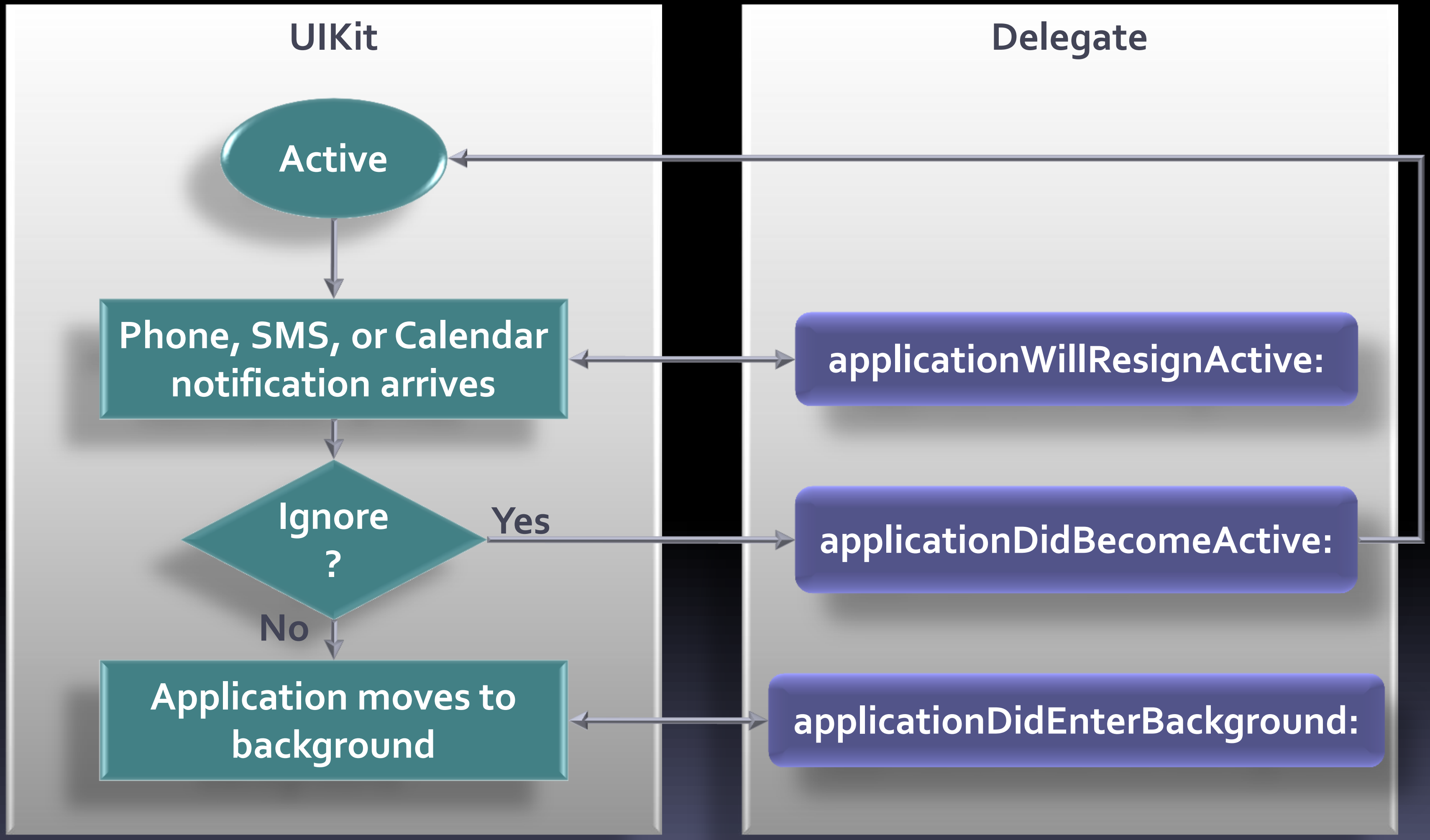
iOS Transition to background


Application running
User presses the Home button
Application moves to the background
Application Delegate
applicationWillResignActive:
applicationDidEnterBackground:

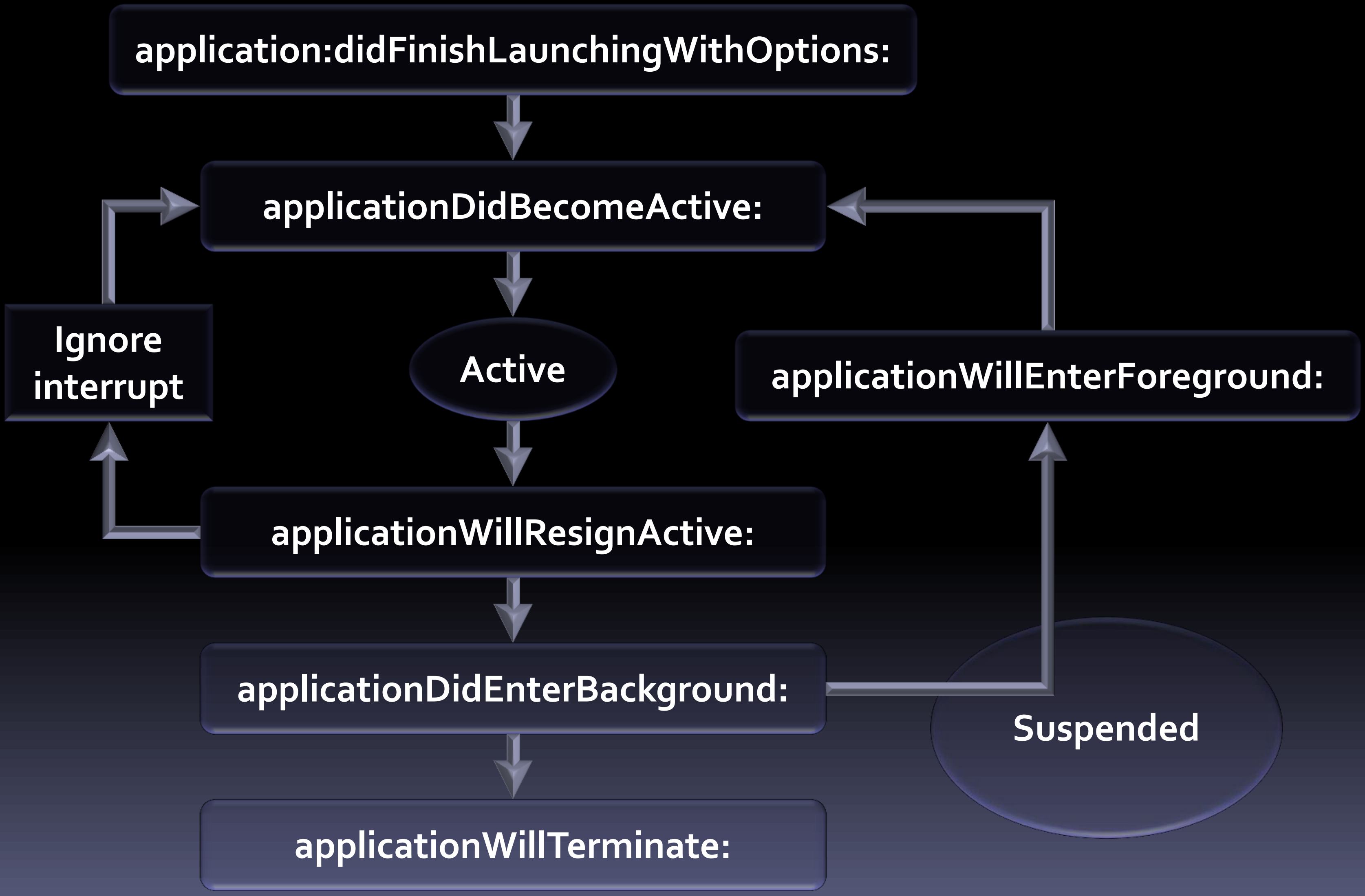
iOS Return to foreground


Application in the background
Application is relaunched
Application enters the foreground
Application Delegate
applicationWillEnterForeground:
applicationDidBecomeActive:

iOS Interruption handling


UIKit
Delegate
Active
Phone, SMS, or Calendar notification arrives
applicationWillResignActive:
Ignore ?
Yes
applicationDidBecomeActive:
No
Application moves to background
applicationDidEnterBackground:

iOS 4 Application lifecycle


application:didFinishLaunchingWithOptions:
applicationDidBecomeActive:
Ignore interrupt
Active
applicationWillEnterForeground:
applicationWillResignActive:
applicationDidEnterBackground:
Suspended
applicationWillTerminate:

Reminder

- Proposal due Wednesday