Overview of Concurrency Patterns in Android & Java Frameworks (Part 1)

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Learning Objectives in this Part of the Lesson

• Understand how *patterns* improve the structure & functionality of Java & Android concurrency frameworks used by apps & services

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<th>Android/Java Mechanism</th>
<th>Pattern</th>
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<td>Looper</td>
<td><em>Thread-Specific Storage</em></td>
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<td>HaMeR framework &amp; Java Executor framework</td>
<td><em>Command Processor &amp; Active Object</em></td>
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<td>AsyncTask framework</td>
<td><em>Half-Sync/Half-Async</em></td>
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<td>Java LinkedBlockingQueue</td>
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<td>Java Streams framework</td>
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Patterns & Idioms in Android & Java Concurrency Frameworks
Patterns & Idioms in Android Concurrency Frameworks

- Android concurrency frameworks apply POSA & GoF patterns to overcome design constraints & ensure quality attributes

See en.wikipedia.org/wiki/Concurrency_pattern
Patterns & Idioms in Android Concurrency Frameworks

- Both frameworks also implement Android concurrency idioms

See [en.wikipedia.org/wiki/Programming_idiom](en.wikipedia.org/wiki/Programming_idiom)
Patterns & Idioms in Android Concurrency Frameworks

- Both frameworks also implement Android concurrency idioms
- An idiom is a pattern that’s specific to a certain context, such as a design method, language, or mobile platform

See [en.wikipedia.org/wiki/Programming_idiom](en.wikipedia.org/wiki/Programming_idiom)
Patterns & Idioms in Android Concurrency Frameworks

- Both frameworks also implement Android concurrency idioms
- An idiom is a pattern that’s specific to a certain context, such as a design method, language, or mobile platform
  - e.g., messages passed between threads via `sendToTarget()`

See developer.android.com/reference/android/os/Message.html#sendToTarget()
Patterns & Idioms in Android Concurrency Frameworks

- Patterns/idioms are also needed to program Android’s concurrency frameworks

See developer.android.com/guide/topics/resources/runtime-changes.html()
Patterns & Idioms in Android Concurrency Frameworks

- Patterns/idioms are also needed to *program* Android’s concurrency frameworks, e.g.
- Use the *MVP* pattern to robustly handle runtime configuration changes

See [en.wikipedia.org/wiki/Model-view-presenter](http://en.wikipedia.org/wiki/Model-view-presenter)
Patterns & Idioms in Android Concurrency Frameworks

• Patterns/idioms are also needed to *program* Android’s concurrency frameworks, e.g.
  • Use the *MVP* pattern to robustly handle runtime configuration changes
  • “Copy a message passed as a param to handleMessage() before storing it”

See [groups.google.com/forum/#!topic/android-developers/9pHuc7lGunY](groups.google.com/forum/#!topic/android-developers/9pHuc7lGunY)
End of Overview of Concurrency Patterns in Android & Java Frameworks (Part 1)