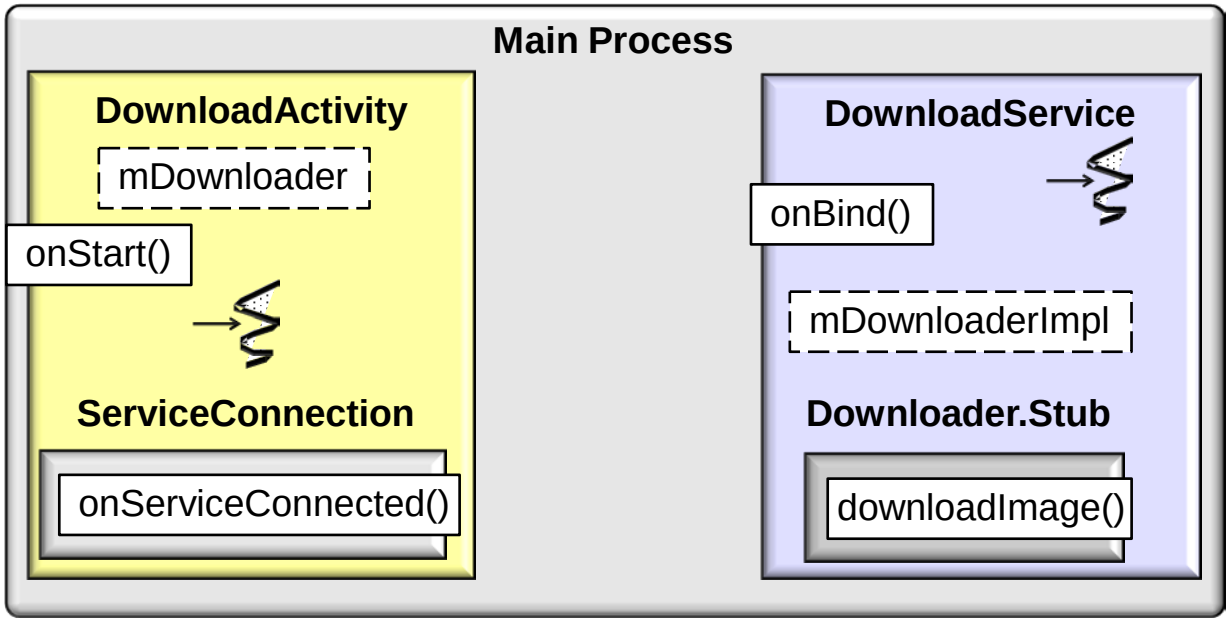
Concurrent Programming with Android Services

Concurrent Programming with Android Services

- Started/Bound Services can run in same/different threads/processes as clients



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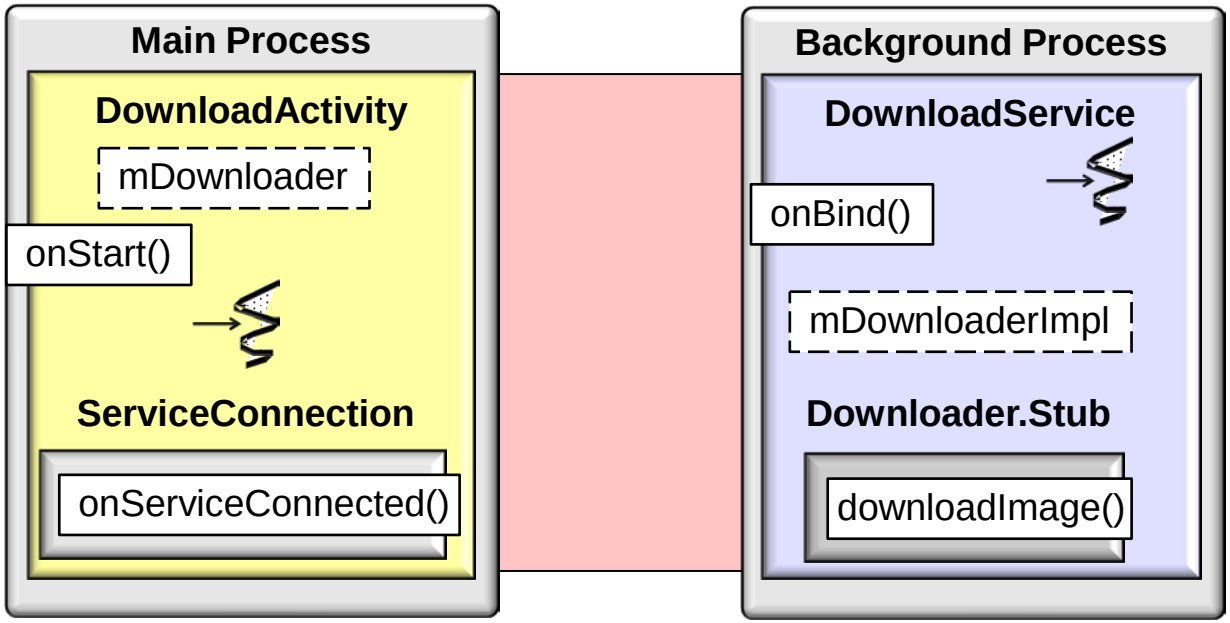
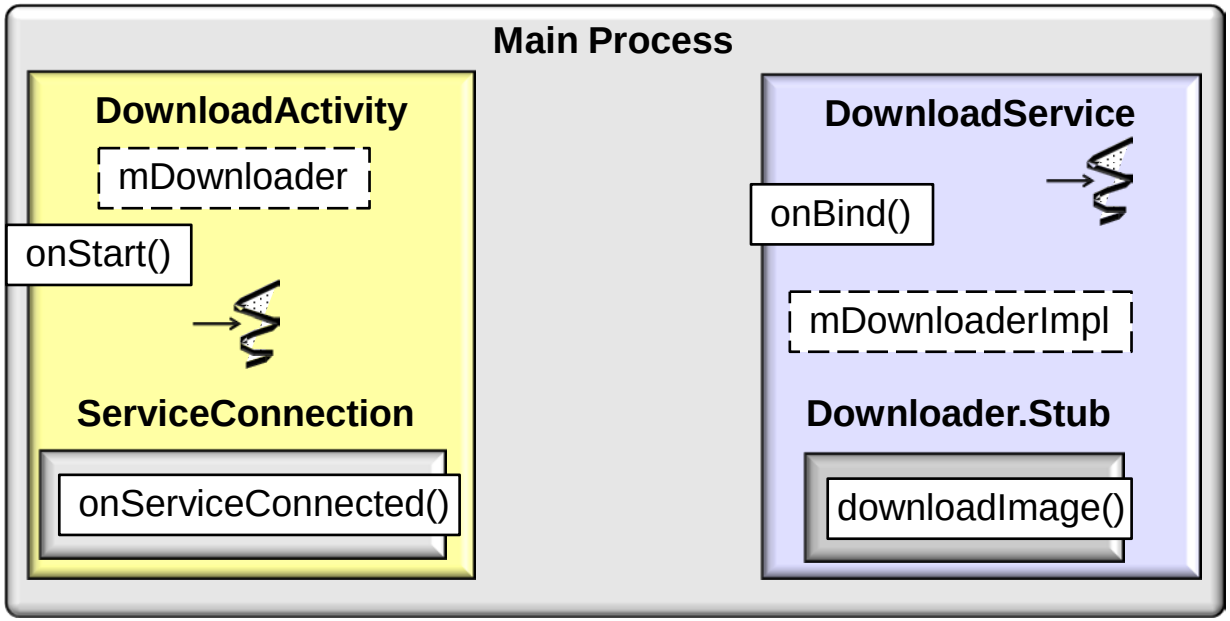


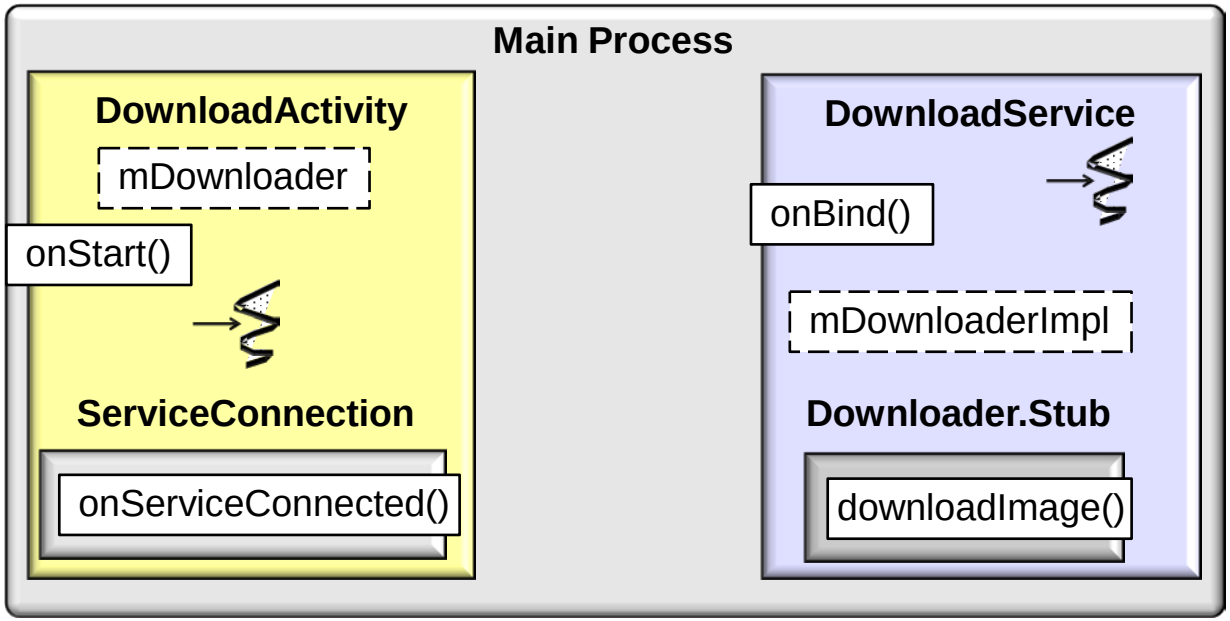
Concurrent Programming with Android Services

- Started/Bound Services can run in same/different threads/processes as clients
  - Can be based on programmer logic



Concurrent Programming with Android Services

- Started/Bound Services can run in same/different threads/processes as clients
  - Can be based on programmer logic
    - e.g., extending IntentService, starting a Java Thread, using the Executor Service Thread pool, etc.



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- Started/Bound Services can run in same/different threads/processes as clients
  - Can be based on programmer logic
  - Or selected via a configuration setting in AndroidManifest.xml

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<service
  android:name=".DownloadService"
  android:process=":myProcess"
</service>
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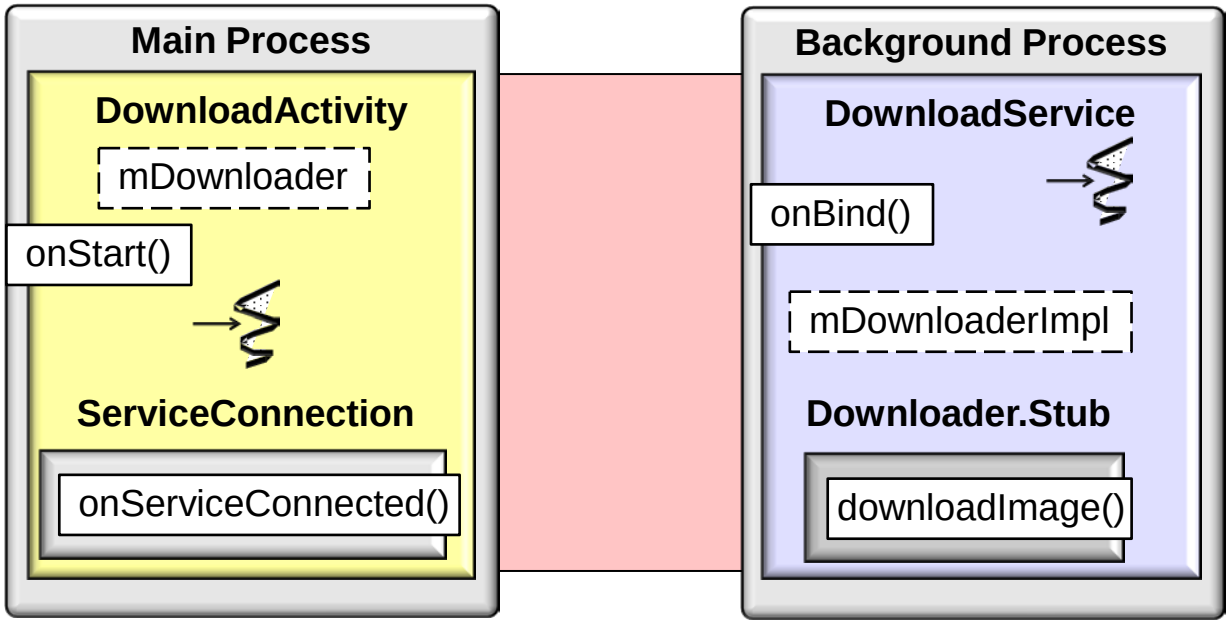

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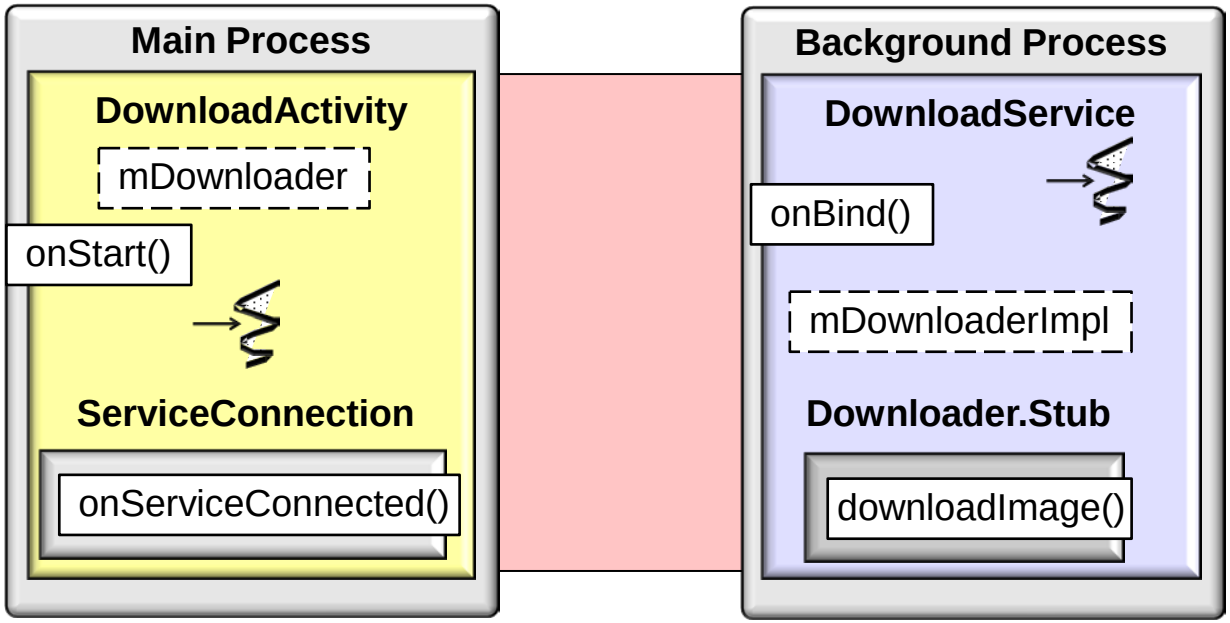

See developer.android.com/guide/topics/manifest/service-element.html#proc

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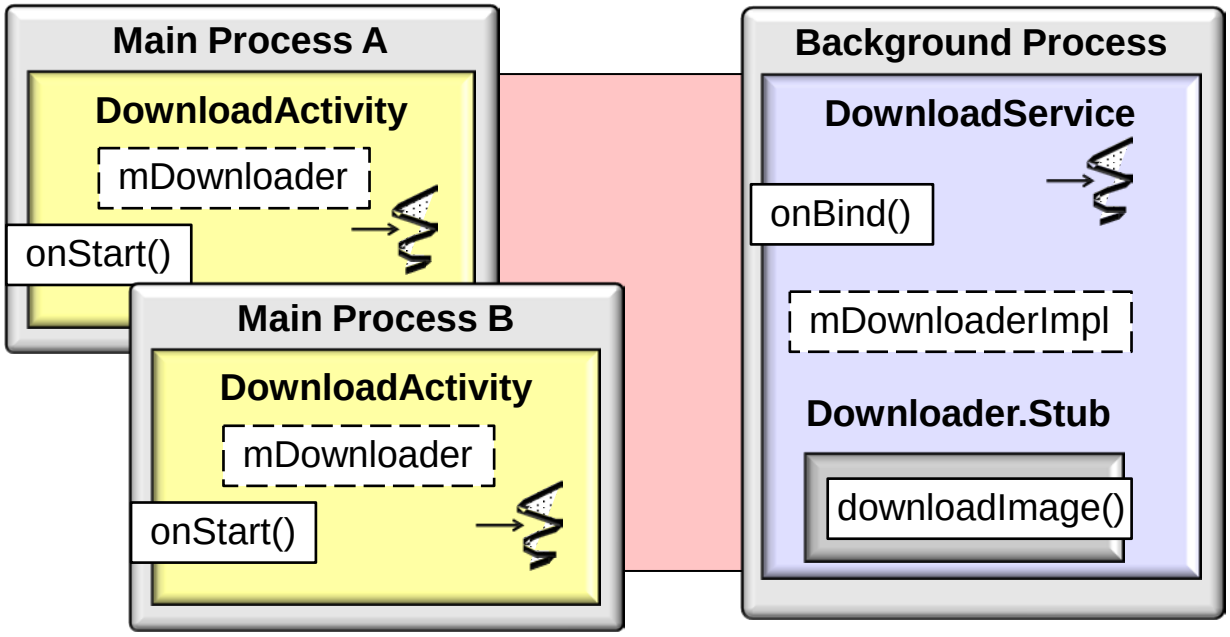
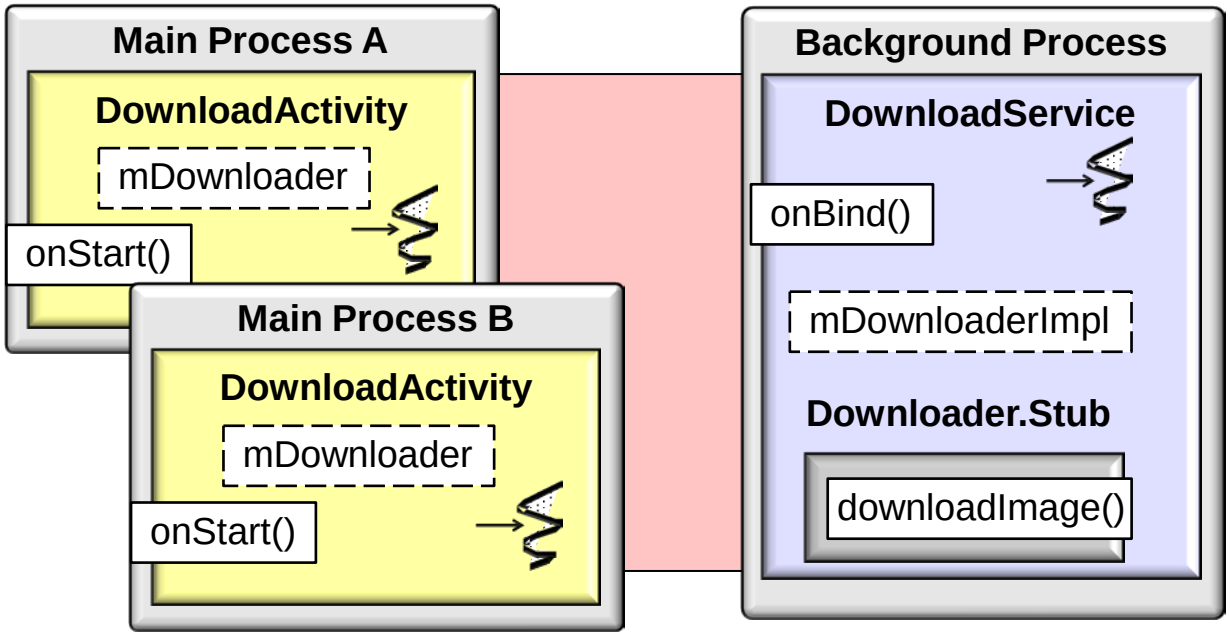
- Services shared by applications must run in separate processes



See www.vogella.com/tutorials/AndroidServices/article.html#service_advice

Concurrent Programming with Android Services

- Started/Bound Services can run in same/different threads/processes as clients
- Services shared by applications must run in separate processes
  - Running a Service in its own address space can make applications more robust if failures, hangs, or garbage collection occurs



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- Services shared by applications must run in separate processes
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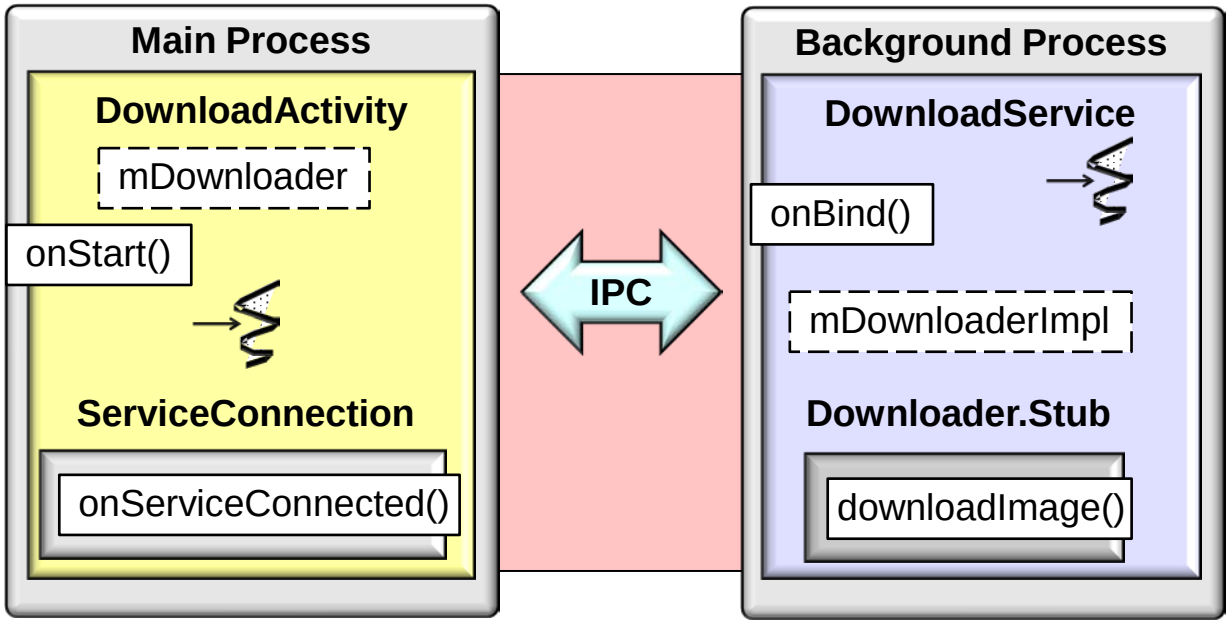

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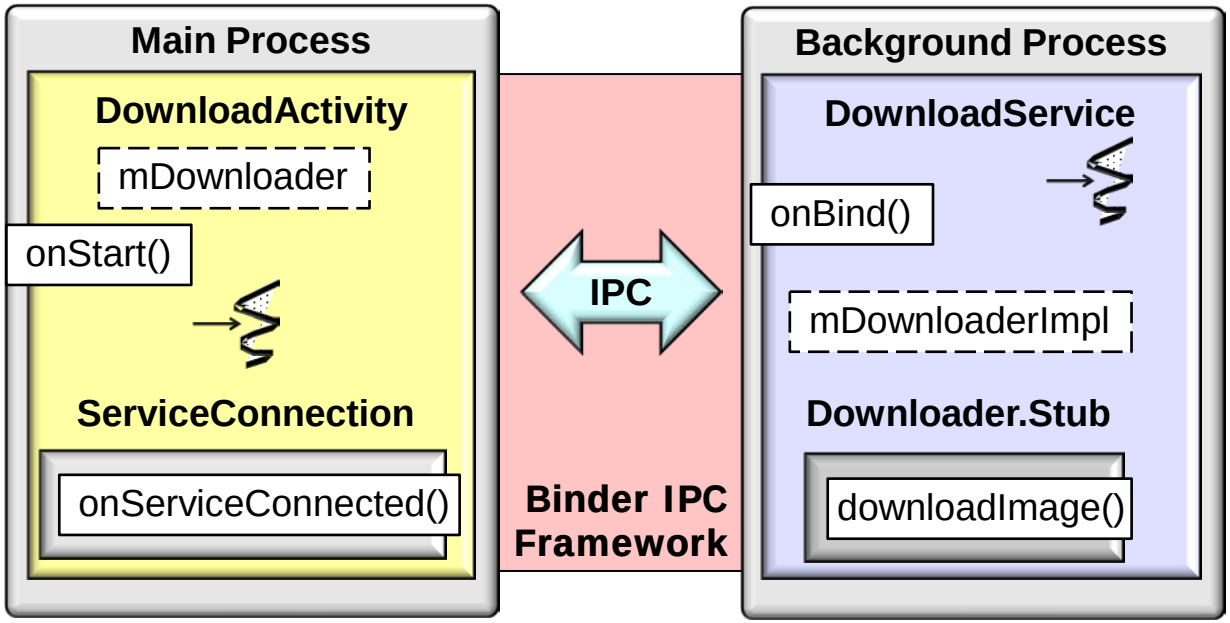
  - e.g., Intents, Messengers & Handlers, Android Interface Definition Language (AIDL), etc.



See elinux.org/Android_Binder

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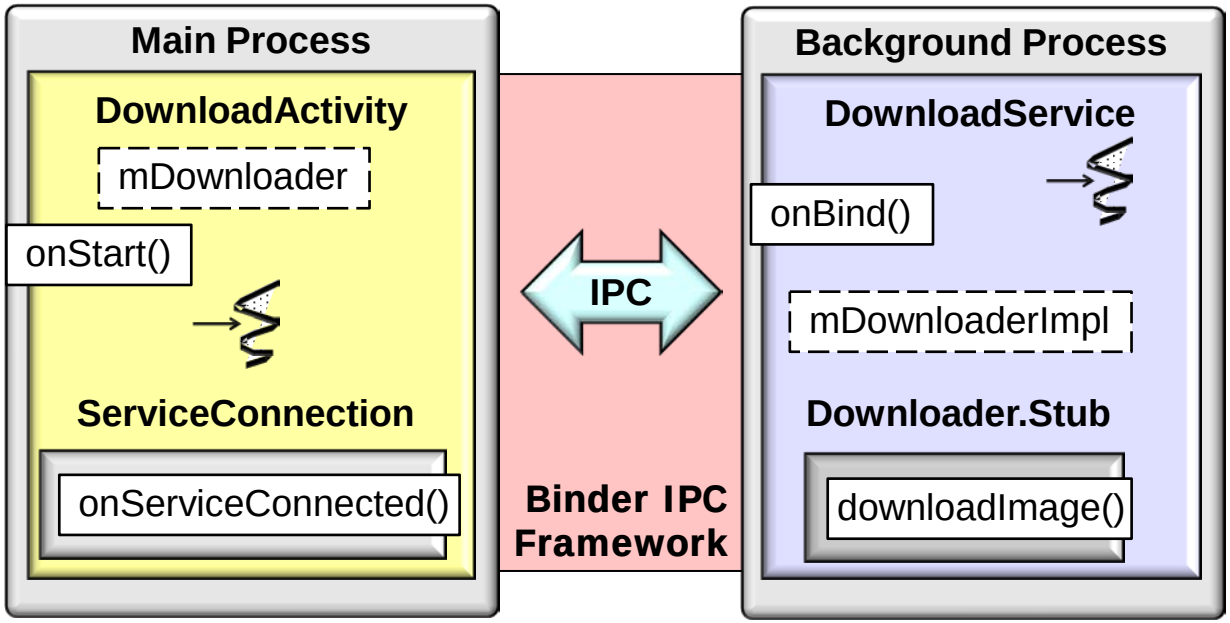

See upcoming module on “Android Services & Communication Frameworks”

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- Many POSA & GoF patterns are applied to implement Services & guide IPC between Activities & Services
  - e.g., Activator, Template Method, Command Processor, Active Object, Proxy, Broker, & Publisher-Subscriber

See upcoming section on “Android Concurrency & Communication Patterns”

Applying Services in Android

Applying Services in Android

- Android's packaged applications contain many started & bound Services

Service Type	Example	Behavior
Started	SMS & MMS	Manage message operations, such as sending data, text, & PDU messages
	Alert	Handle calendar event reminders
Bound	Bluetooth Headset	Provides Headset & Handsfree for Phone App
	Media Playback	Provides audio playback in the background
	Exchange Email	Send email messages

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