

Understanding Activity Lifecycle



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What to Expect from This Module



Activity Lifecycle

Activity Lifecycle Methods

Activity State Management

Activity Lifecycle

Common causes of Activity destruction

- Leaving with the back button
- Calling finish method
- System initiated

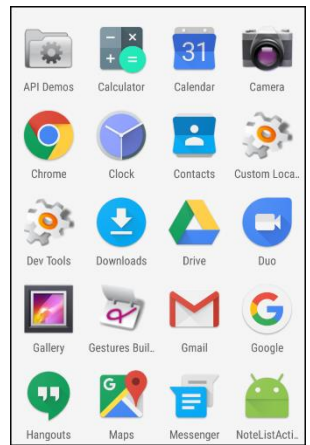
System initiated destruction

- Generally to reclaim resources
- Prolonged period in the background
- System experiencing resource pressure



Task

Process



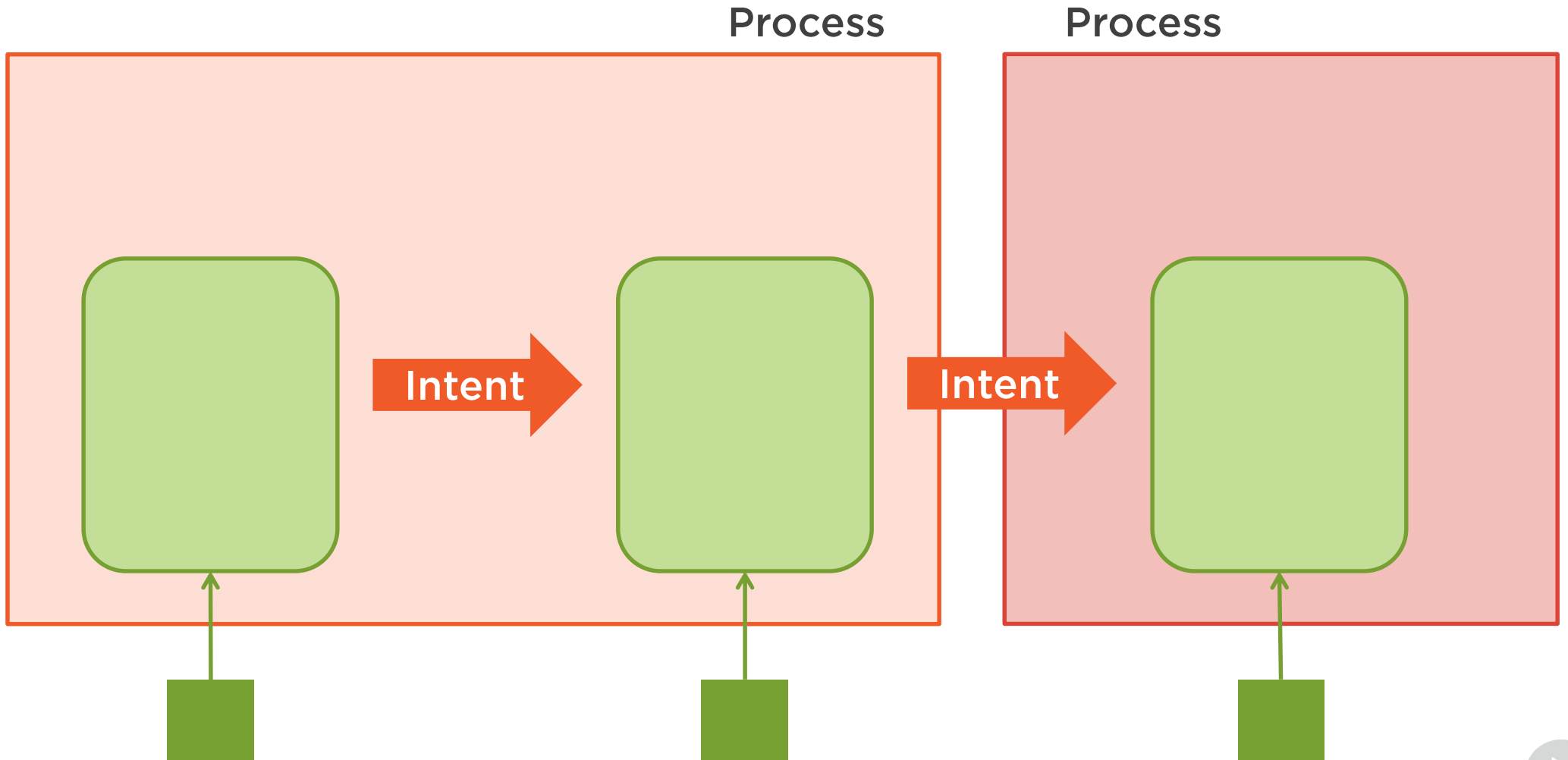
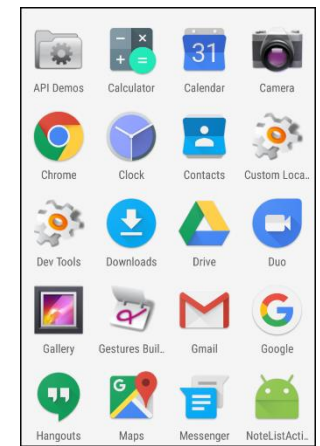
Intent

Intent

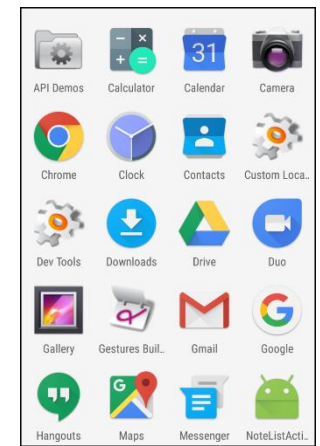
Back



Task



Task



Process

Process

Intent

Intent

Intent

Back

Back



Activity Lifecycle Methods

Lifetimes within Activity lifecycle

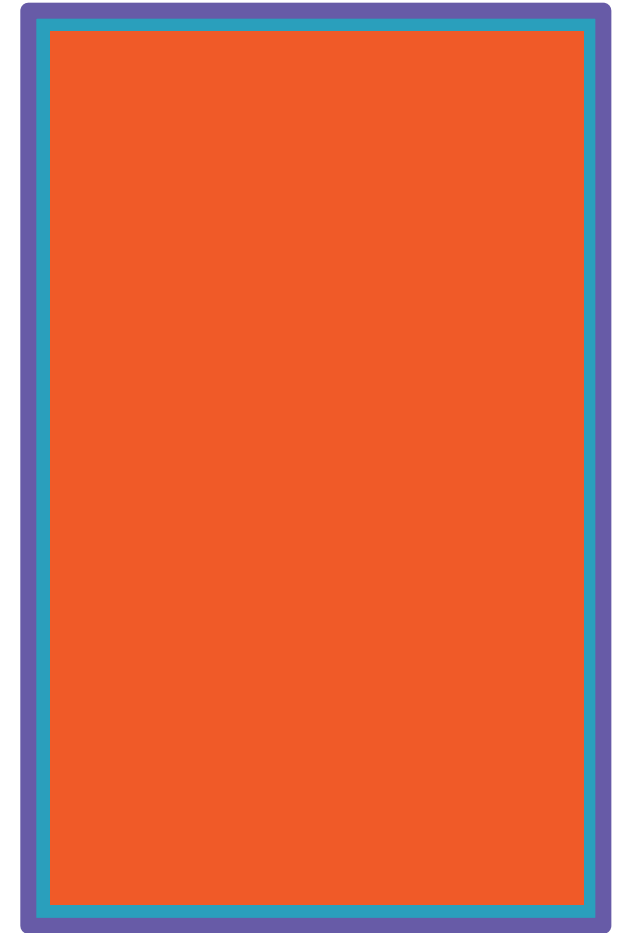
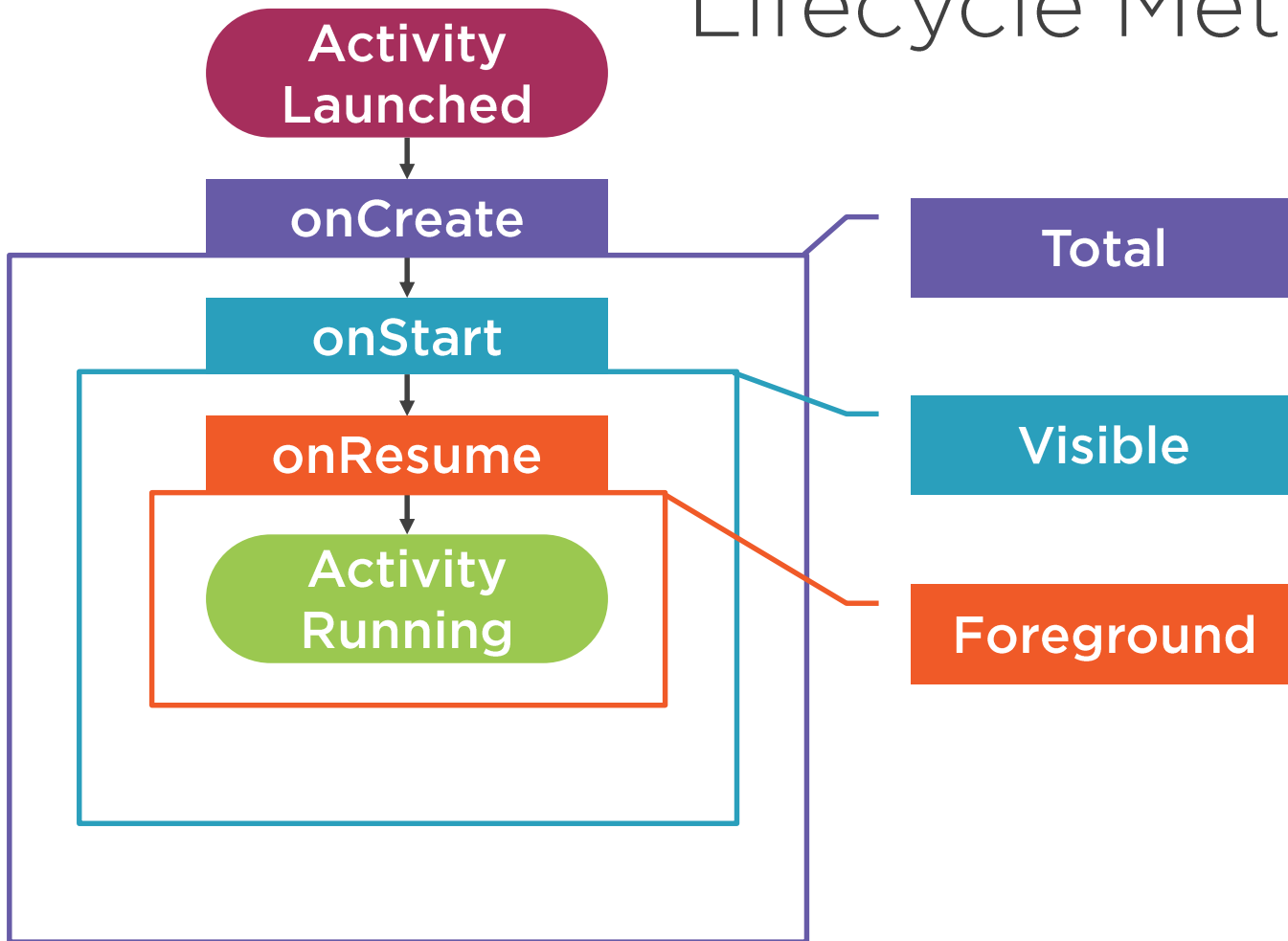
- Total lifetime
- Visible lifetime
- Foreground lifetime

Activity lifecycle methods

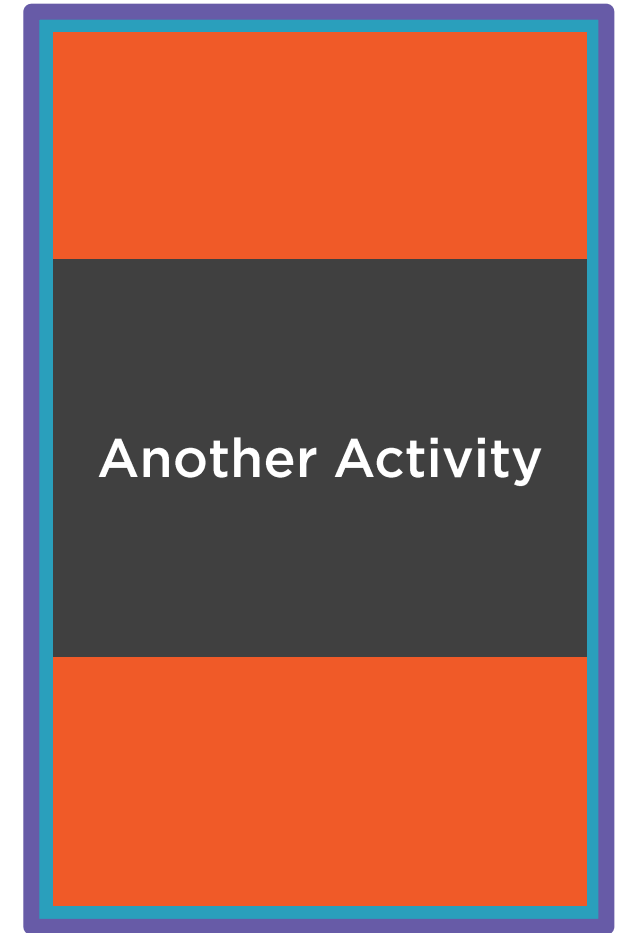
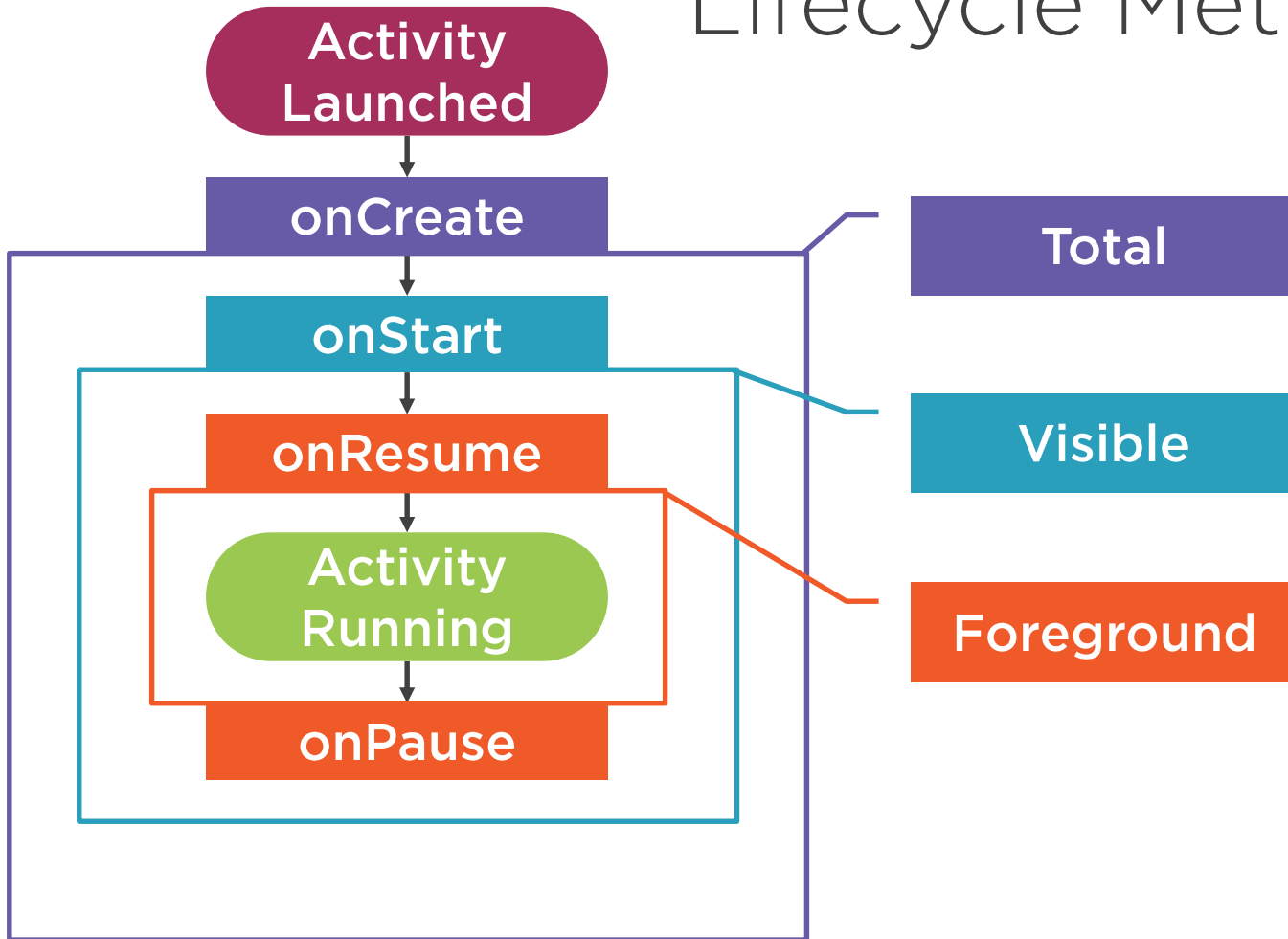
- Methods for start/end of each lifetime
- A few additional methods for transitions



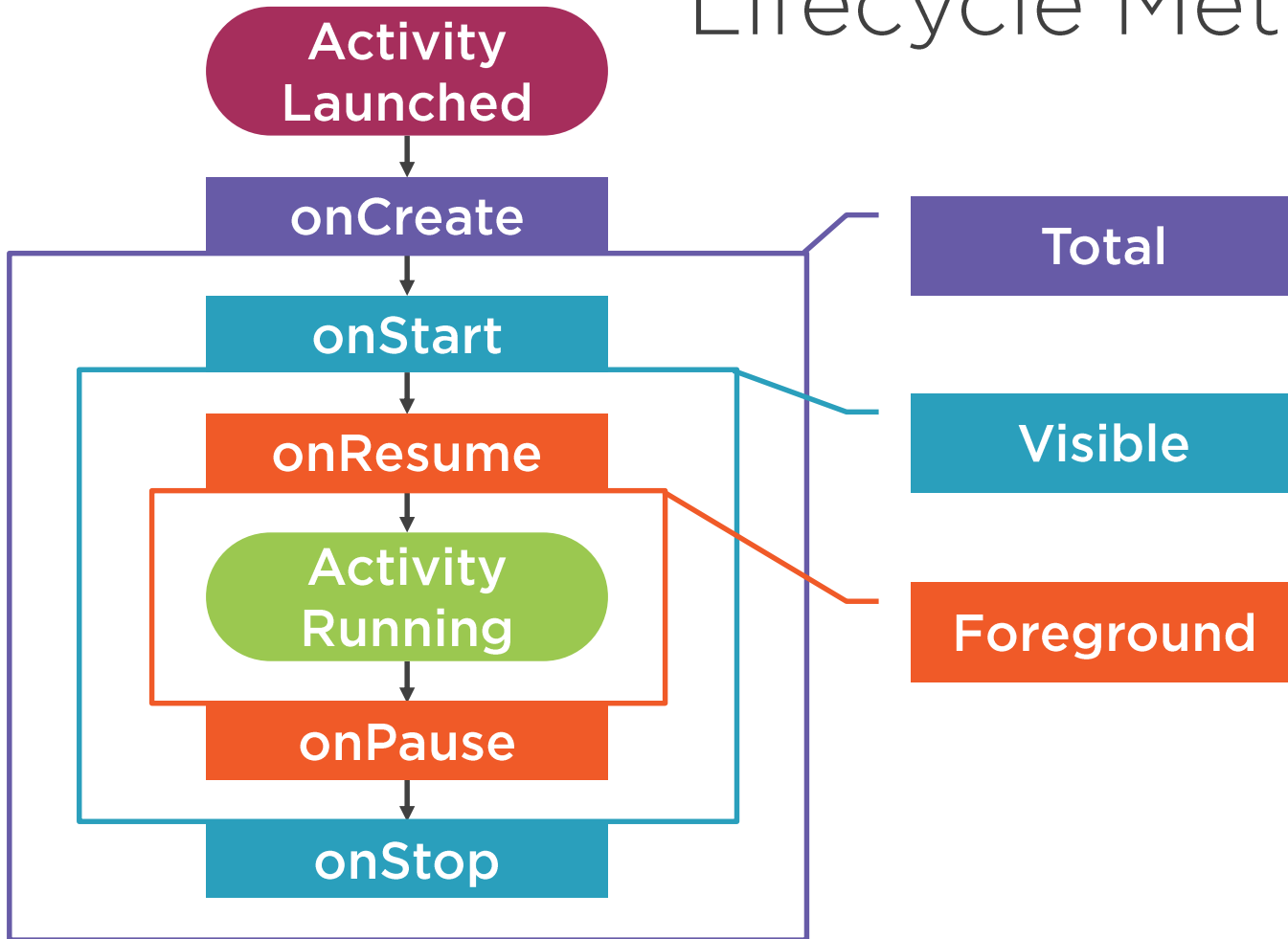
Lifecycle Methods



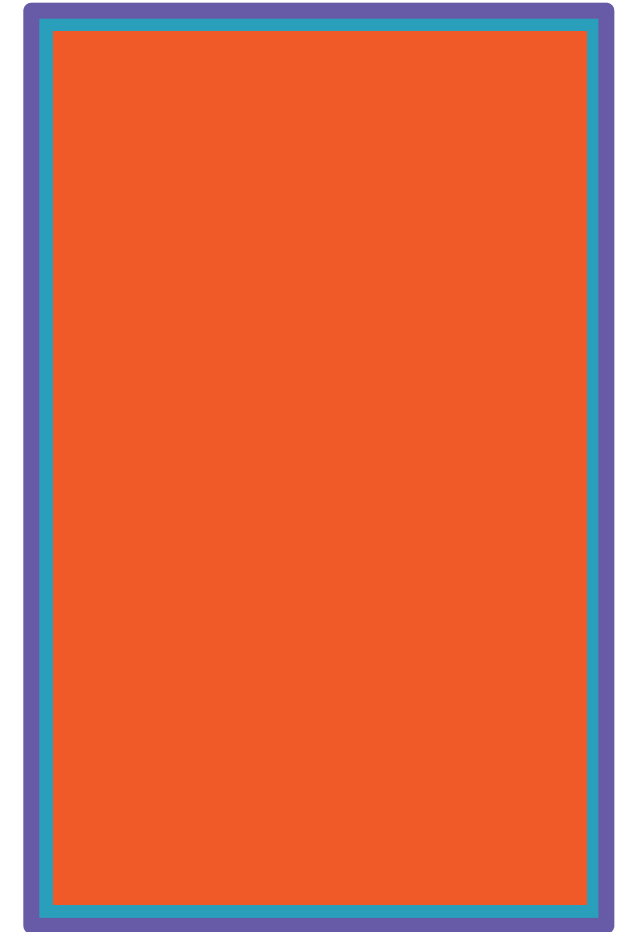
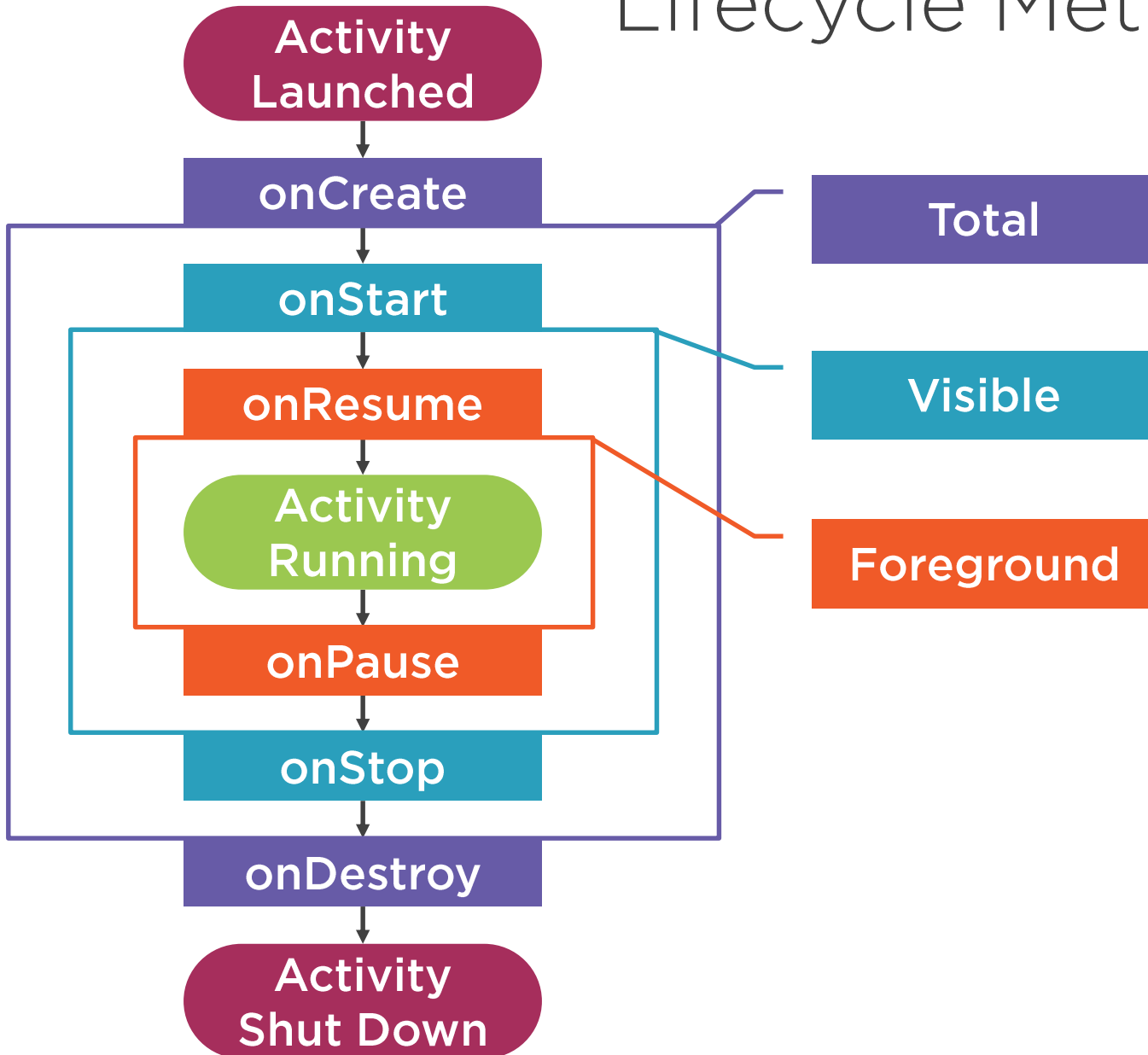
Lifecycle Methods



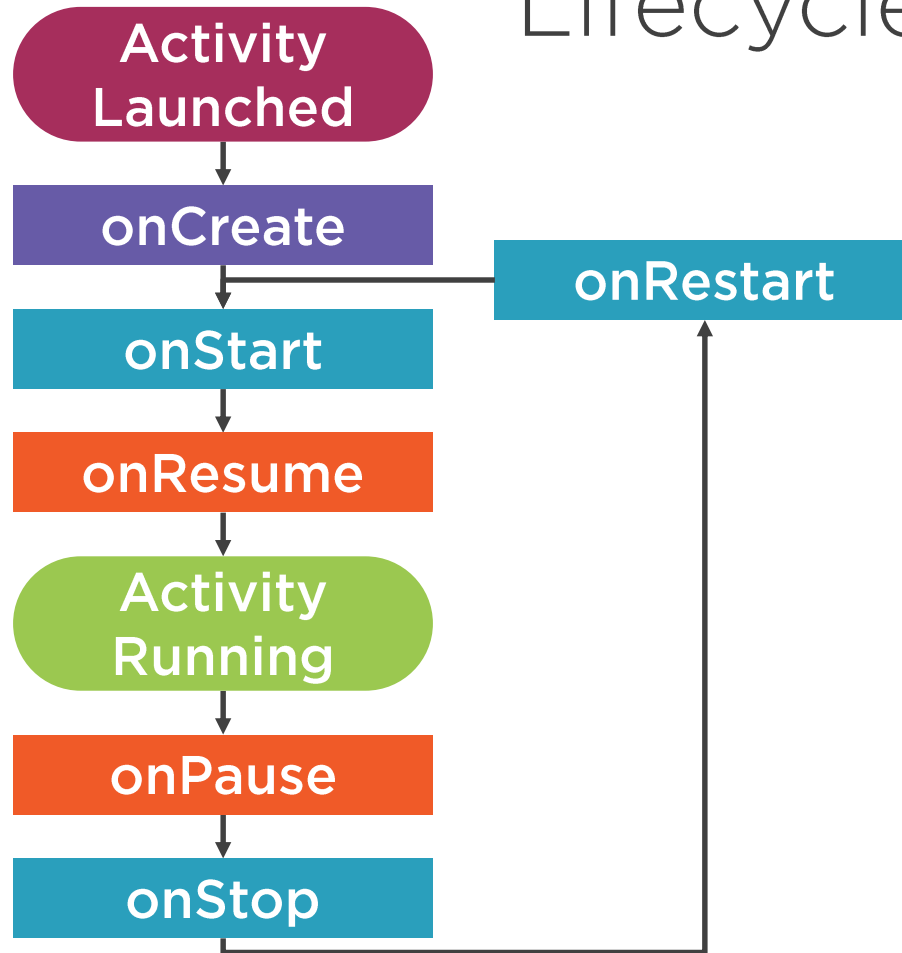
Lifecycle Methods



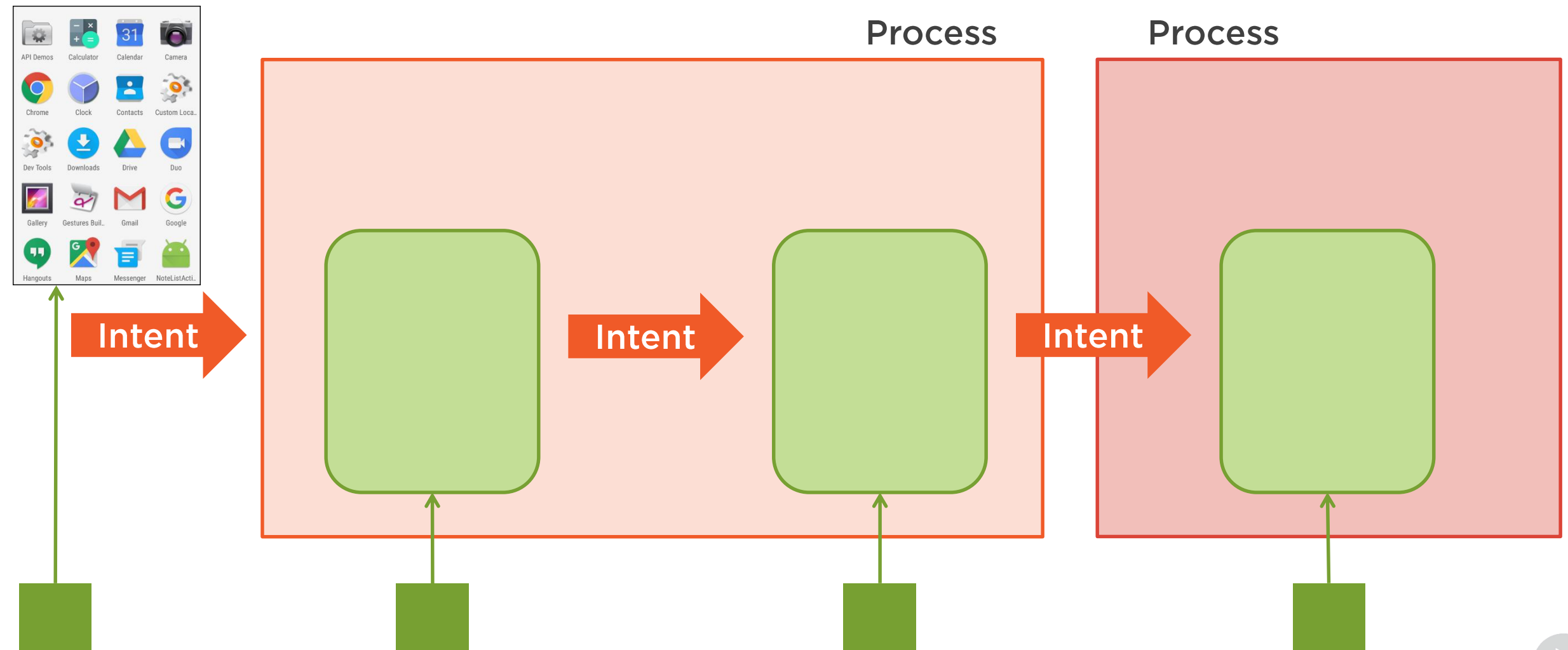
Lifecycle Methods



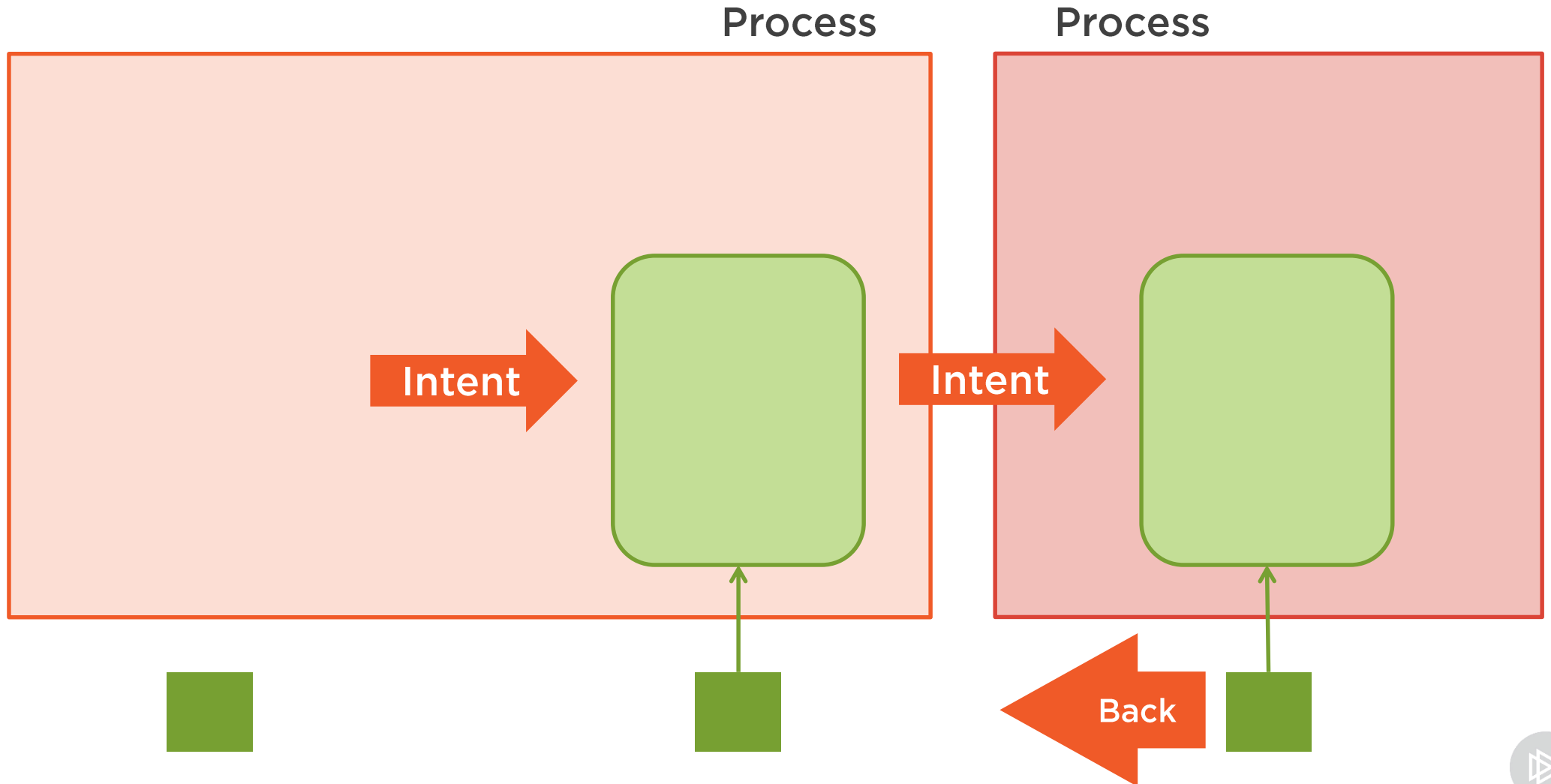
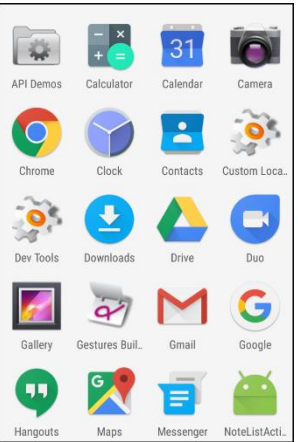
Lifecycle Methods



Activity State Management



Activity State Management



Activity State Management

Activities provide state management

- Opportunity to save before destroy
- Saved state provided on restore

Saving state

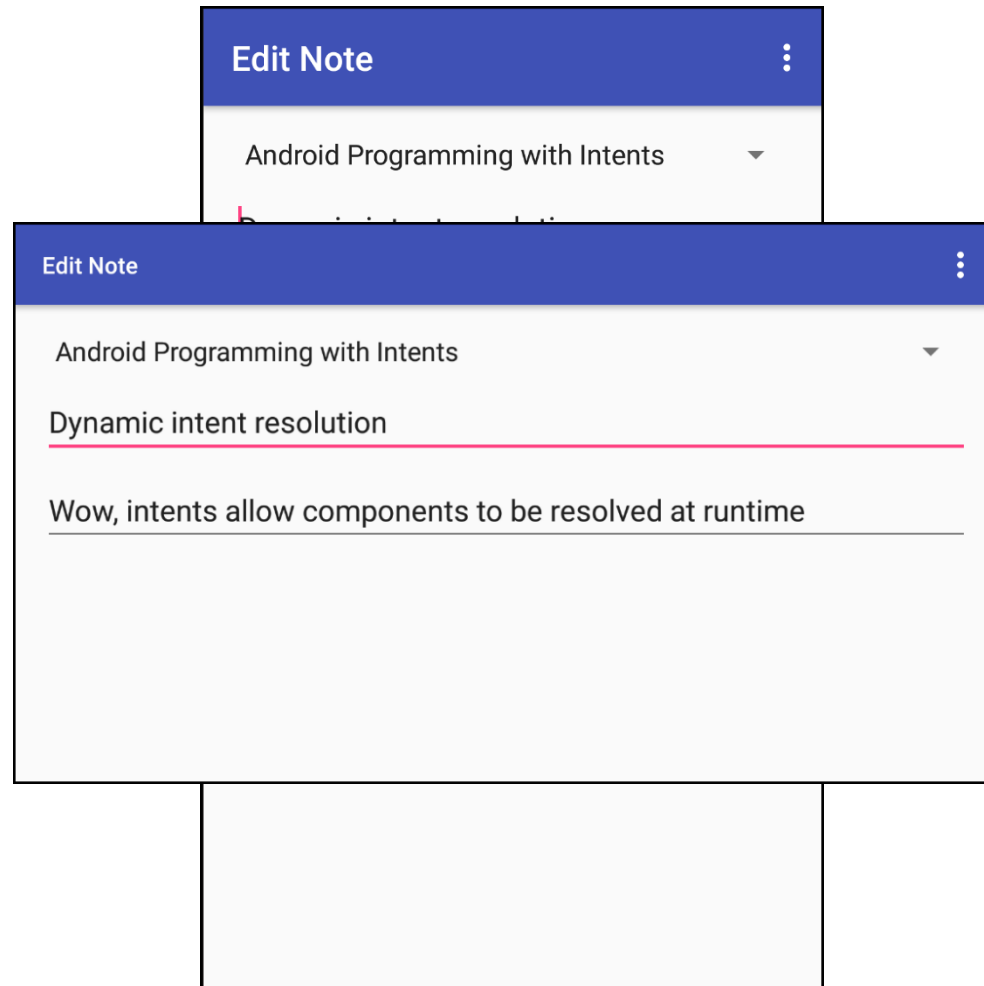
- onSaveInstanceState
- Write Activity state to passed Bundle

Restoring state

- onCreate
- Receives saved Bundle on restore
- Bundle is null on initial create
- Intent remains available on restore



Activity State Management



Managing Activity State

Maintaining activity state

- Writing to a persistent store is expensive
- Need a better solution for maintaining state across configuration changes

ViewModel

- Stores activity state in-process
- State stored separate from the activity
- Extend ViewModel class to customize
- Add properties and methods specific to your activity's state requirements



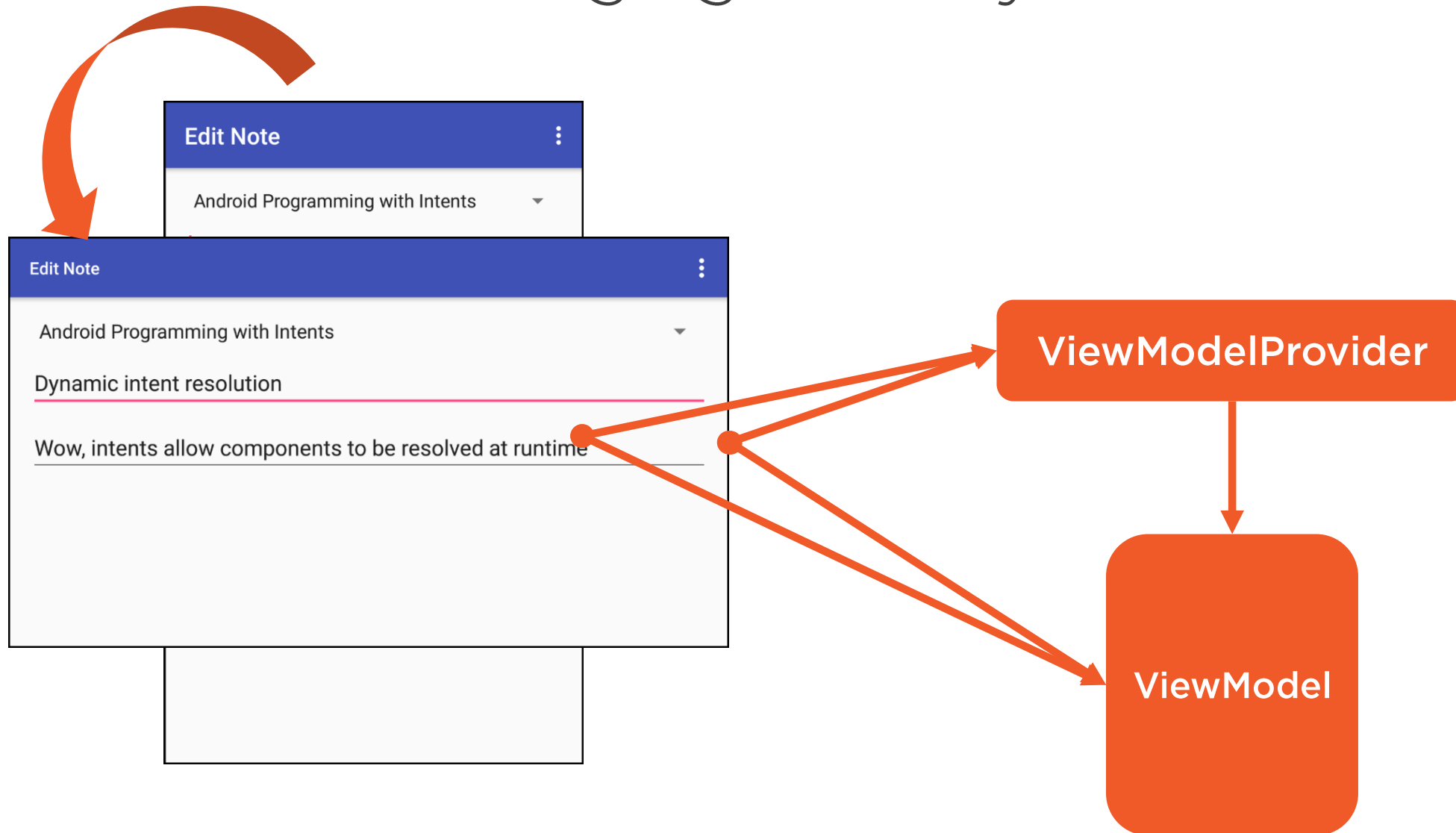
Managing Activity State

ViewModelProvider

- Manages ViewModel instances
- Creates new instance when needed
- Retrieves existing when available



Managing Activity State



Summary



Activity lifecycle

- Total lifetime
- Visible lifetime
- Foreground lifetime
- Methods for start/end of each lifetime

Activity state management

- Activities often destroyed & restored
- Save state in `onSaveInstanceState`
- Saved state passed to `onCreate`

Summary



Configuration changes impact activities

- System destroys and recreates
- State stored directly in activity is lost

ViewModel

- State stored separate from the activity
- Extend ViewModel class to customize

ViewModelProvider

- Manages ViewModel instances
- Creates new instance when needed
- Retrieves existing when available



Summary



A complete state management solution

- Uses a multi-part approach

ViewModel

- Holds activity state fields

onSaveInstanceState

- Persist ViewModel fields to bundle

onCreate

- Use ViewModel when existing instance
- Restore ViewModel from bundle when new ViewModel instance

