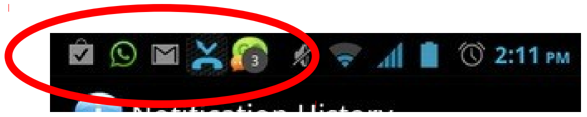
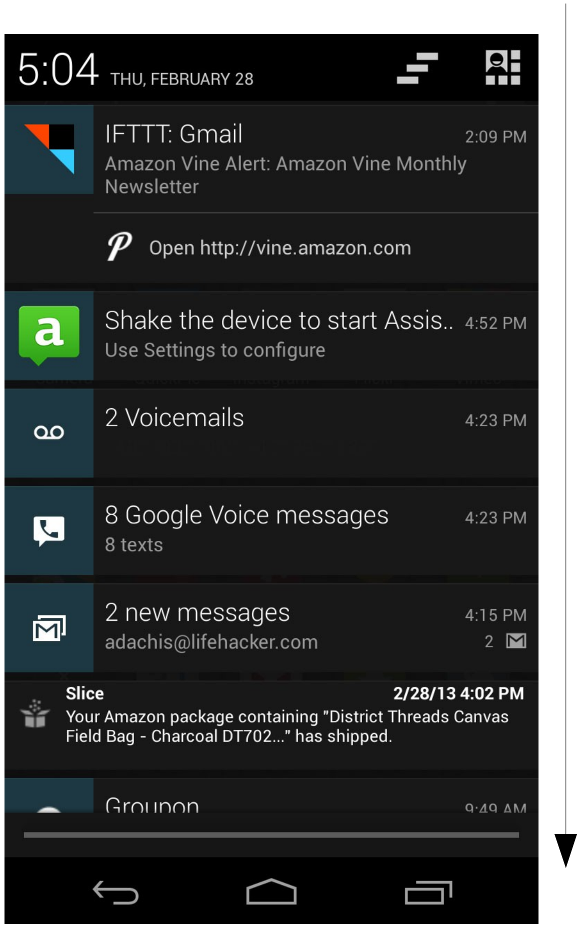
CS 193A

Notifications

Notifications

- **notification**: A message displayed to the user outside of any app's UI in a top *notification drawer* area.
  - used to indicate system events, status of service tasks, etc.





5:04 THU, FEBRUARY 28

IFTTT: Gmail 2:09 PM
Amazon Vine Alert: Amazon Vine Monthly Newsletter
Open http://vine.amazon.com

Shake the device to start Assis.. 4:52 PM
Use Settings to configure

2 Voicemails 4:23 PM

8 Google Voice messages 4:23 PM
8 texts

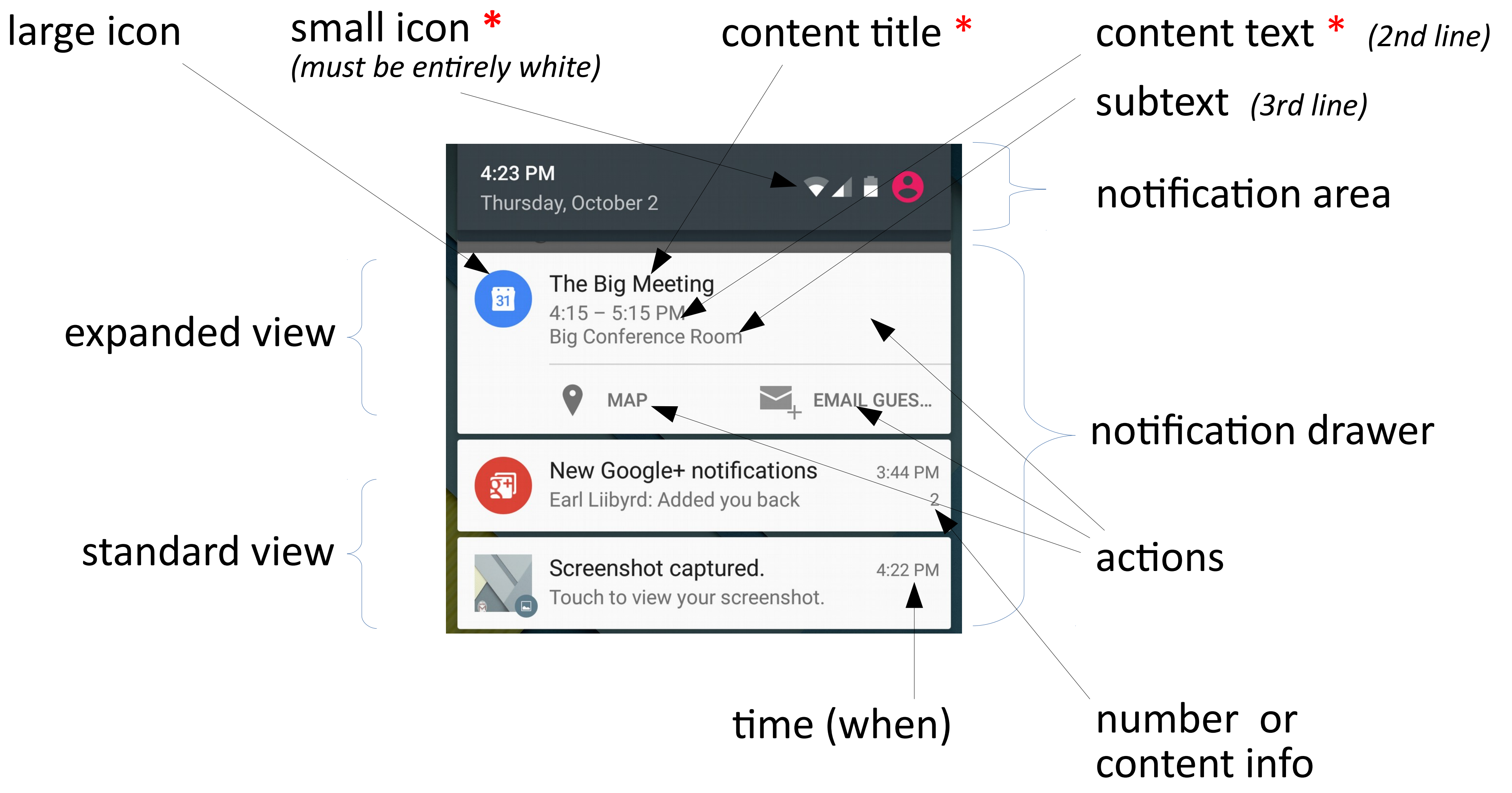
2 new messages 4:15 PM
adachis@lifehacker.com 2

Slice 2/28/13 4:02 PM
Your Amazon package containing "District Threads Canvas Field Bag - Charcoal DT702..." has shipped.

Groupon 9:49 AM

- notifications can have:
  - **icons** (small, large)
  - a **title**
  - a detailed **description**
  - one or more associated **actions** that will occur when clicked
  - ...

Anatomy of a notification



* = required

Creating a Notification

- Create a notification using a `Notification.Builder`.
- Use `NotificationManager` to send out the notification.

```
val builder = Notification.Builder(this)
        .setContentTitle("title")
        .setContentText("text")
        .setAutoCancel(true)
        .setSmallIcon(R.drawable.icon)
val notification = builder.build()

val manager = getSystemService(Context.NOTIFICATION_SERVICE)
              as NotificationManager
manager.notify(ID, notification)
```

Notification.Builder methods (link)

Method	Description
`setAutoCancel(`***boolean***`)`	whether to hide when clicked
`setColor(`***int***`)`	background color
`setContentIntent(`***Intent***`)`	intent for action to run when clicked
`setContentText("`***text***`")`	detailed description
`setContentTitle("`***title***`")`	large heading text
`setGroup("`***name***`")`	group similar notifications together
`setLargeIcon(`***Bitmap***`)`	image for big icon
`setLights(`***argb, onMS, offMS***`)`	blinking lights!
`setNumber(`***n***`)`	a number at right of notification
`setOngoing(`***boolean***`)`	is this a long-term notif. that can't be dismissed?
`setPriority(`***priority***`)`	from PRIORITY_MIN to PRIORITY_MAX
`setProgress(`***max, prog, bool***`)`	sets a progress bar to *prog* out of *max*
`setSmallIcon(`***id***`)`	image file for icon
`setSound(`***uri***`)`	a sound to play
`setStyle(`***style***`)`	sets an expanded style when dragged down
`setSubText("`***text***`")`	third line of text (under content text)
`setTicker("`***text***`")`	text to scroll across top bar
`setVibrate(`***pattern***`)`	makes notification vibrate
`setVisibility(`***vis***`)`	whether notification should show on lock screen
`setWhen(`***ms***`)`	timestamp of notification

Notification with action

- Normally when the user clicks on a notification, an action should occur. (direct the user to a particular app / activity, etc.)
  - To achieve this, use an intent inside your notification.
  - Must wrap it inside a "pending intent" object.

```
val builder = ...
val intent = Intent(this, ActivityClassName::class.java)
intent.putExtra("key1", "value1")
...
val pending = PendingIntent.getActivity(
        this, 0, intent, 0)
builder.setContentIntent(pending)

val notification = builder.build()
...
```

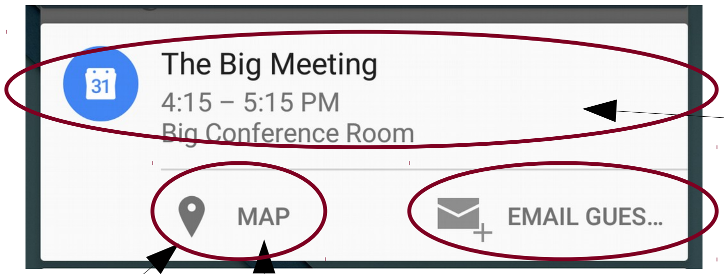
Notification that starts a service

- To have your notification send a message to a service instead of launching an activity, use `PendingIntent.getService`.

```
val builder = ...
val intent = Intent(this, ServiceClassName::class.java)
intent.putExtra("key1", "value1")
...
val pending = PendingIntent.getService(
        this, 0, intent, 0)
builder.setContentIntent(pending)

val notification = builder.build()
...
```

Anatomy of Actions


The Big Meeting
4:15 – 5:15 PM
Big Conference Room

click here to run 'content intent'
(main action)

icon

title

Notification Channels

- In Android 8.0 (Oreo) and higher, you must assign notifications to *channels* so users can filter/control them better.
  - Choose an arbitrary "***id***" and "***name***" string for your notification, such as the name of your app.

```
// create a notification channel for newer Android versions
if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
    val channel = NotificationChannel("id", "name",
                  NotificationManager.IMPORTANCE_DEFAULT)
    val manager = getSystemService(NOTIFICATION_SERVICE)
                  as NotificationManager
    manager.createNotificationChannel(channel)
    val builder = Notification.Builder(this, "id")
    ...
} else {
    // notification channels not needed for old Android versions
    val builder = Notification.Builder(this)
    ...
}
```

Multiple actions (link)

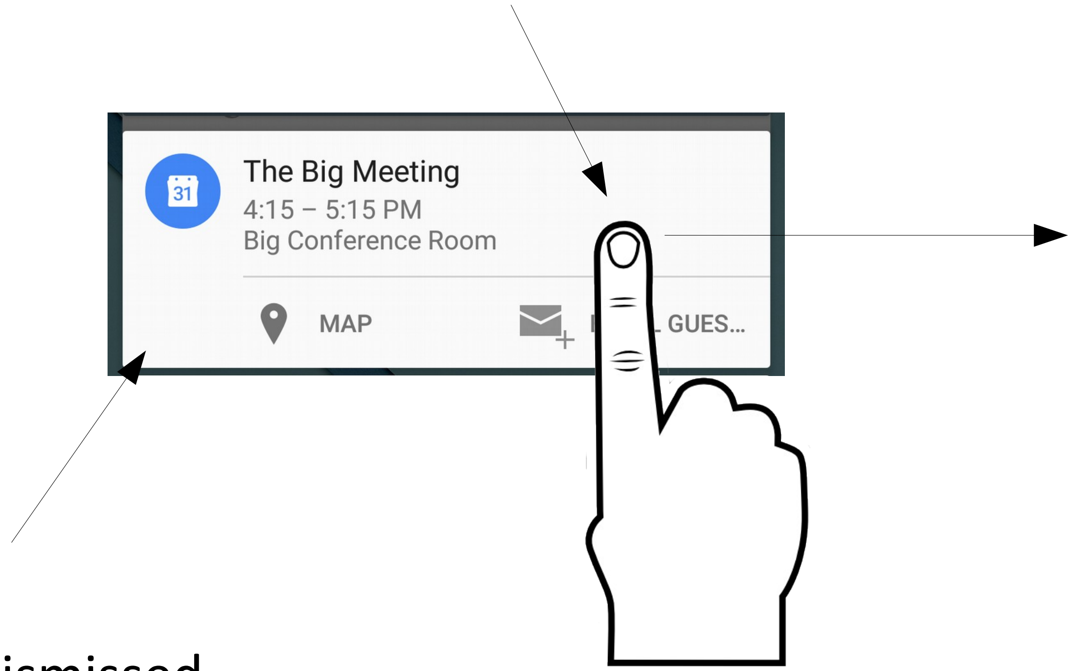
- You can supply additional actions to a notification.
  - Build an `Action` object, then call add`Action` to add it.
  - The actions will appear underneath the expanded notification.

```
val action =
  Notification.Action.Builder(iconID, "title", PendingIntent)
  .build()

val builder = Notification.Builder(this)
        .setContentTitle("title")
        .set ...
        .addAction(action)
val notification = builder.build()
...
```

Dismissing a Notification

if set to '**auto cancel**' mode,
disappears when you click it

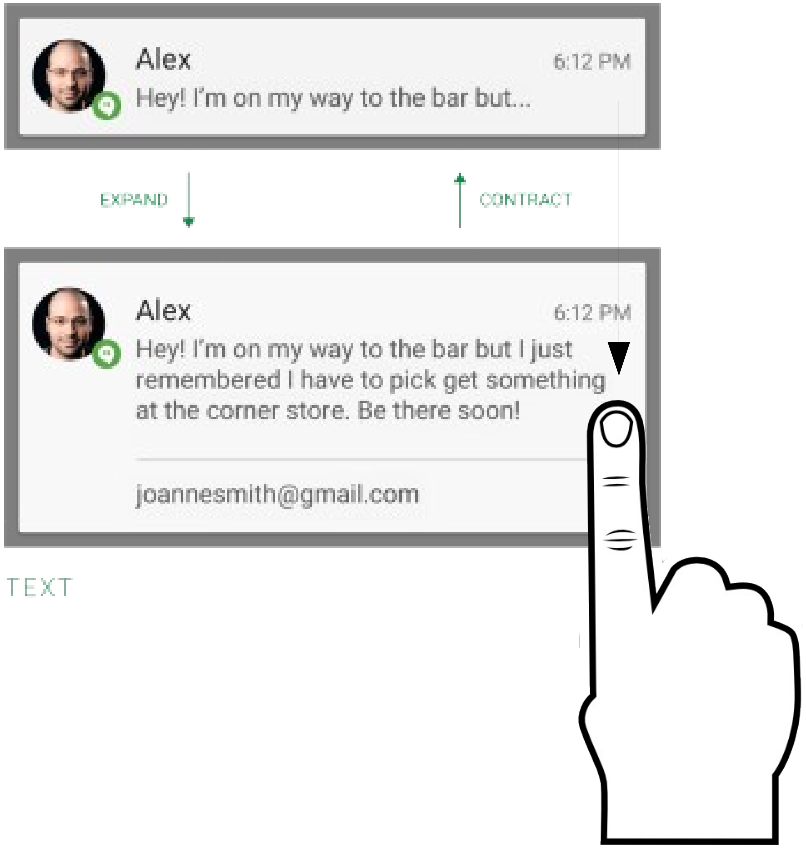


swipe to cancel
(unless it's 'ongoing')

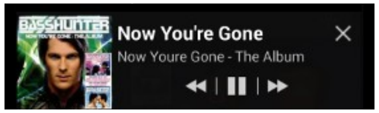
if set to '**ongoing**',
cannot be canceled/dismissed
(grr!)

Expanding a Notification (link)

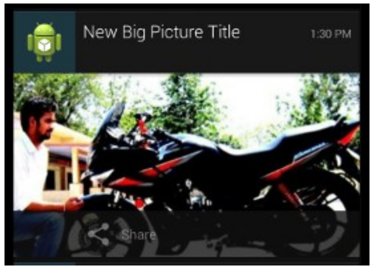
if the user drags a notification downward, it can show an "expanded" layout view


Alex
6:12 PM
Hey! I'm on my way to the bar but...
EXPAND
CONTRACT
Alex
6:12 PM
Hey! I'm on my way to the bar but I just remembered I have to pick get something at the corner store. Be there soon!
joannesmith@gmail.com
TEXT

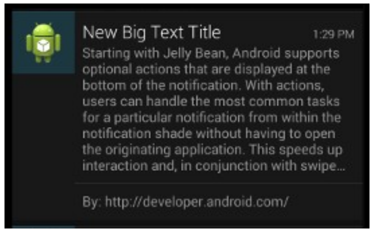
MediaStyle



BigPictureStyle

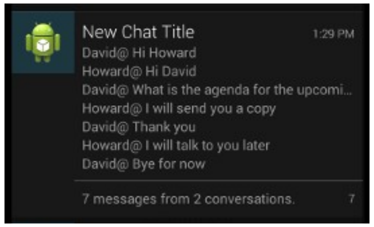


BigTextStyle



New Big Text Title 1:29 PM
Starting with Jelly Bean, Android supports optional actions that are displayed at the bottom of the notification. With actions, users can handle the most common tasks for a particular notification from within the notification shade without having to open the originating application. This speeds up interaction and, in conjunction with swipe...
By: http://developer.android.com/

InboxStyle



New Chat Title 1:29 PM
David@ Hi Howard
Howard@ Hi David
David@ What is the agenda for the upcomi...
Howard@ I will send you a copy
David@ Thank you
Howard@ I will talk to you later
David@ Bye for now
7 messages from 2 conversations. 7

Expanded notification styles

- To make the notification expandable, use `setStyle` along with one of the `Notification.Style` subclasses.

```
val style =
    Notification.BigTextStyle()
    .bigText("text")
    .setBigContentTitle("title")

val builder = Notification.Builder(this)
        .set ...
        .setStyle(style)

val notification = builder.build()
...
```

Notification.Style subclasses (link)

Methods Common to All	Description
`s.setBigContentTitle("`***title***`")`	replacement title text
`s.setSummaryText("`***text***`")`	truncated first line of preview text to show before expanded

BigTextStyle Method	Description
`s.bigText("`***text***`")`	longer content text to display

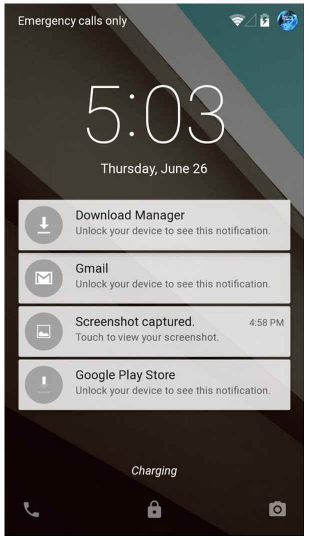
BigPictureStyle Method	Description
`s.bigLargeIcon(`***bitmap***`)`	icon to show when expanded
`s.bigPicture(`***bitmap***`)`	big image to show in center of notification

InboxStyle Method	Description
`s.addLine("`***text***`")`	add a line to the message digest area

MediaStyle Method	Description
`s.setCancelButtonIntent(`***PendingIntent***`)`	set action for when Cancel button is pressed
`s.setMediaSession(`***token***`)`	additional playback information for system UI
`s.setShowActionsInCompactView(`***actions***`)`	actions to display even when not expanded
`s.setShowCancelButton(`***boolean***`)`	whether a top-right cancel button should appear

Other stuff

- Want a **custom layout** for your expanded view?
  - check out `RemoteViews` and `setContent`
- Should your notification show up on the **lock screen**?
  - look into `setVisibility`
- Does your app generate lots of **similar notifications**?
  - group/update them by reusing IDs or `addPerson`
- Is your notification displaying a **long task** like a download?
  - check out `setProgress`
- What **state** will the app have when user clicks notification?
  - may want to make a custom activity stack with `TaskStackBuilder`
- need a nice **icon** for your notification?
  - get Google's material design icons at https://design.google.com/icons/


Emergency calls only

5:03

Thursday, June 26

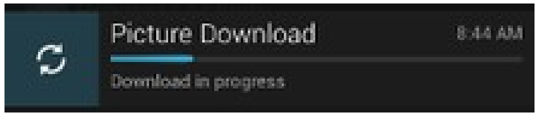
Download Manager
Unlock your device to see this notification.

Gmail
Unlock your device to see this notification.

Screenshot captured. 4:58 PM
Touch to view your screenshot.

Google Play Store
Unlock your device to see this notification.

Charging


Picture Download 8:44 AM
Download in progress