
Xamarin Evolve 2014
Homeward Bound:
Implementing Android
Navigation Patterns
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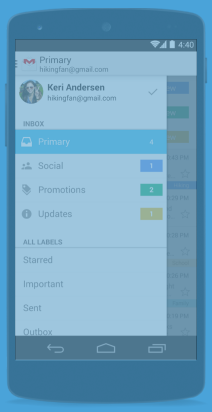
Common Android Navigation Patterns

Stack Navigation

Tab Navigation



Navigation Drader

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Common Android Navigation Patterns

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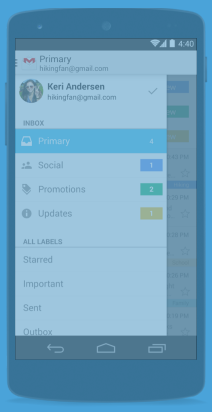
Tab Navigation



Navigation Drader

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Common Android Navigation Patterns

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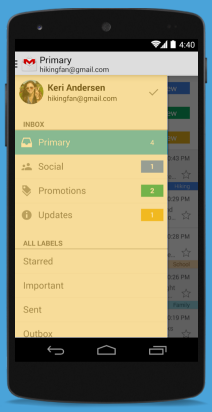

Navigation Drawer

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Android 4+ and the Action Bar

Action "Ice Cream" Bar

- Android 4.0 brings the Action Bar to phones

- The Action Bar provides context sensitive navigation and menus

- The Action Bar can be added to Android devices all the way back to 2.1

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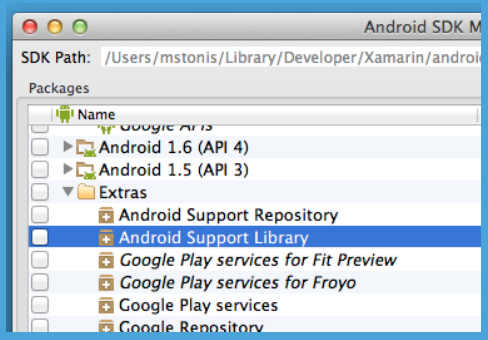
Android Support Library

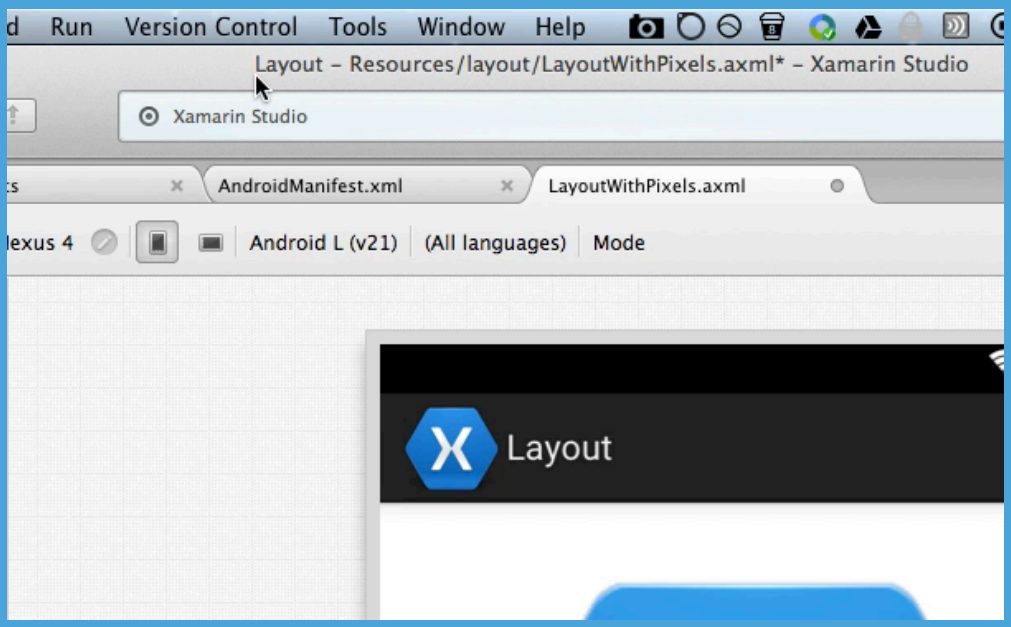
New Android Features for Old Devices

- Brings new Features to Android 1.6+



- New Components Include
  - Action Bar
  - Fragments
  - Rich Notifications

- Early Design and Pre-Release Features



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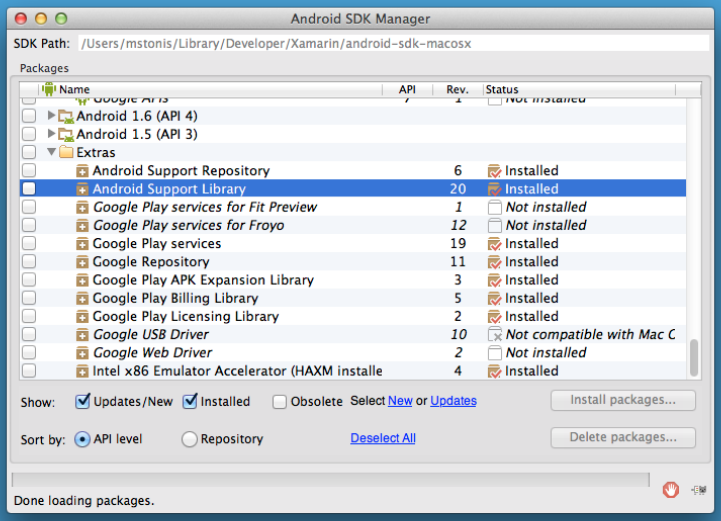
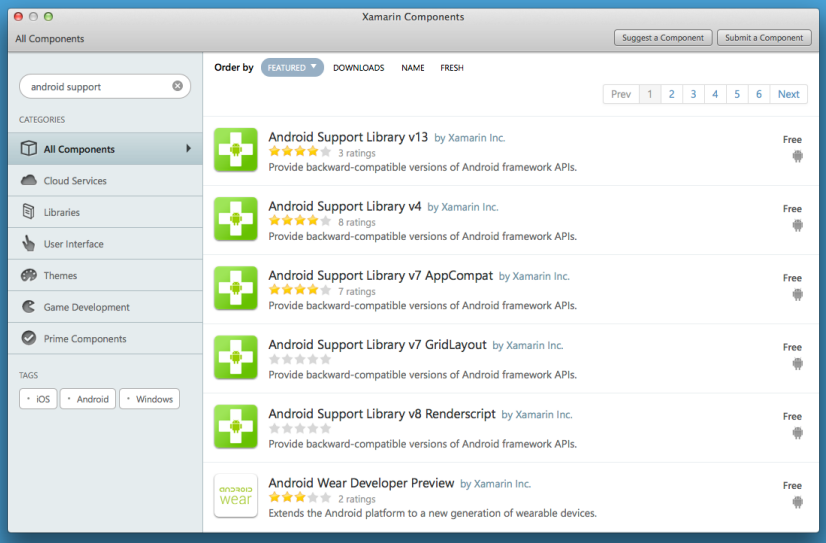
Android Support Library



Android Support Library



Stack Navigation

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Stack Navigation

The standard navigation

- Forward Navigation
- Back Navigation
- Up Navigation

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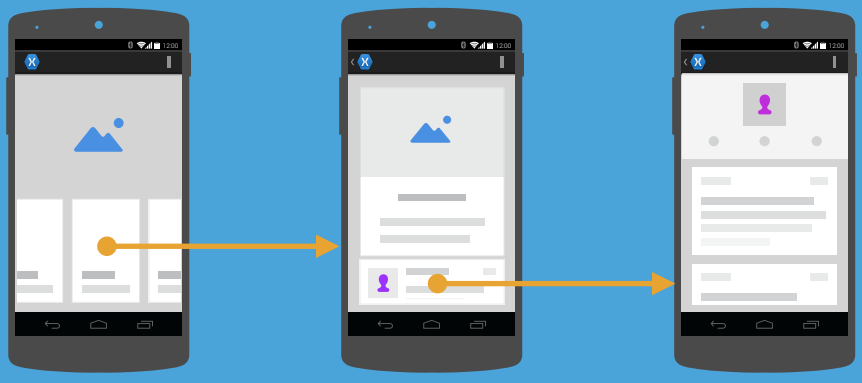
Forward Navigation

Forward Navigation



Forward Navigation

Moving From One Interface to Another

- Navigating forward will add the previous activity onto the back stack
- This is most commonly performed using an *Intent*

Starting an Activity with an Intent

```
var intent = new Intent(this, typeof(SessionActivity));
intent.PutExtra("Title", title);
StartActivity(intent);
```

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Back Navigation

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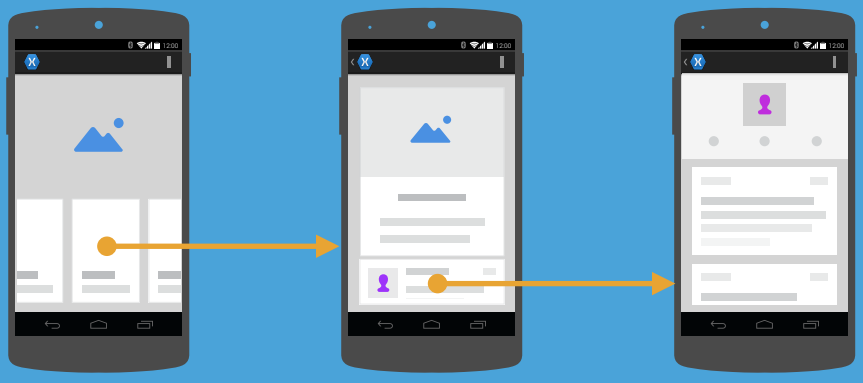
Back Navigation



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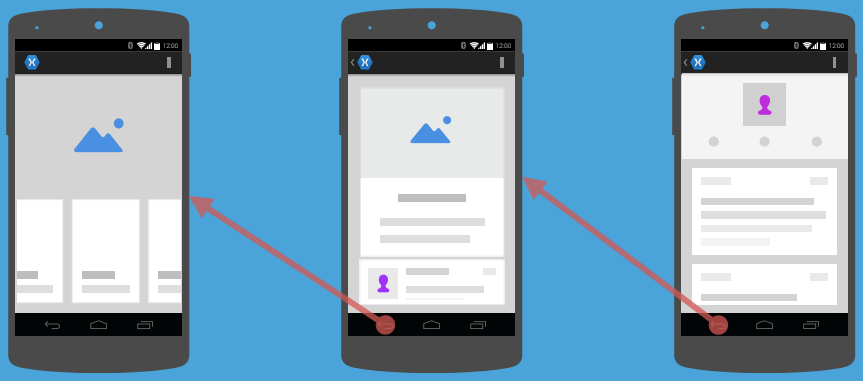
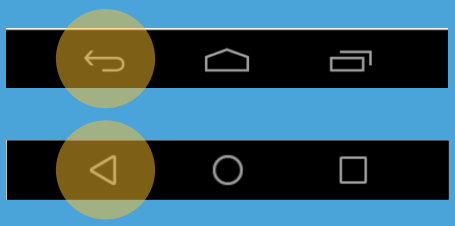
Back Navigation



Back Navigation

Moving back to the last Activity

- All Android devices provide either hardware or software-rendered back buttons



- Screen progression tracked by default, so no additional work to implement

Up Navigation

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Up Navigation

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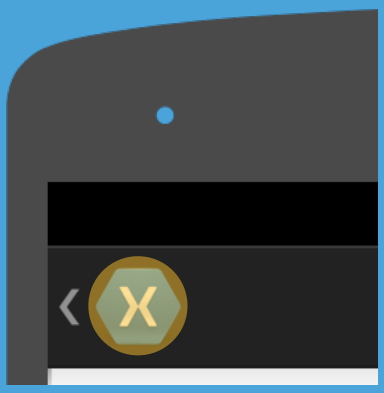
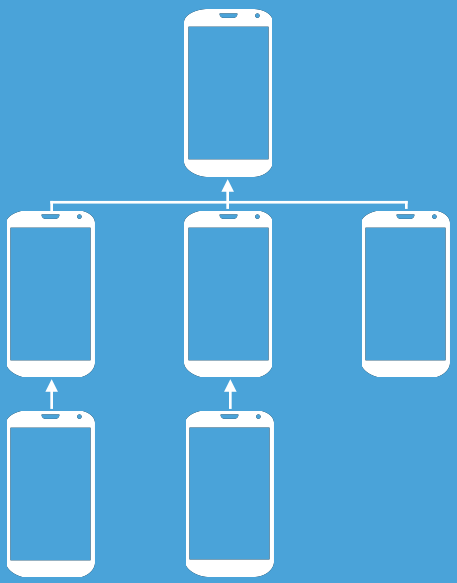
Up Navigation

Navigating Back Up the Application's Hierarchy

- Navigation back to your App's main or home screen
- Consistent navigation for your applications hierarchy
- Your interface will need an Action Bar to properly implement it



App Hierarchy



Specifying Activity Parents

```
[Activity (Label = "Session", ParentActivity = typeof(SessionsActivity))]
//Add Metadata to support Android 4.0 and lower
[MetaData("android.support.PARENT_ACTIVITY", Value = “com.xamarin.university.SessionsActivity")]
public class SessionActivity : Activity
{
  protected override void OnCreate (Bundle bundle)
  {
```


Specifying Activity Parents

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[MetaData("android.support.PARENT_ACTIVITY", Value = “com.xamarin.university.SessionsActivity")]
public class SessionActivity : Activity
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  {
```

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Adding Up Navigation

```
protected override void OnCreate (Bundle bundle)
{
  base.OnCreate (bundle);
  SetContentView (Resource.Layout.Main);

  ActionBar.SetDisplayHomeAsUpEnabled (true);
  ActionBar.SetHomeButtonEnabled (true);
}
```

Responding to Up Navigation

```
public override bool OnOptionsItemSelected (IMenuItem item)
{
  switch (item.ItemId) {
    case Android.Resource.Id.Home:
      NavUtils.NavigateUpFromSameTask (this);
    default:
      break;
  }
}
```

Responding to Up Navigation

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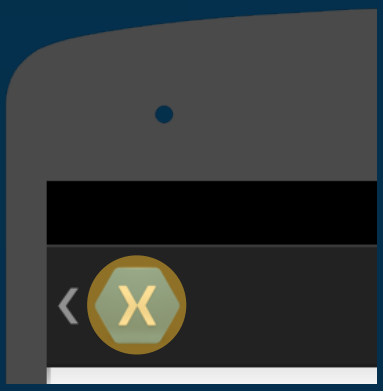

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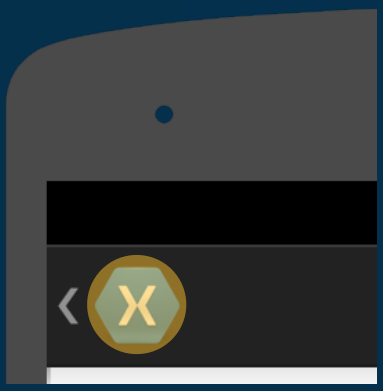
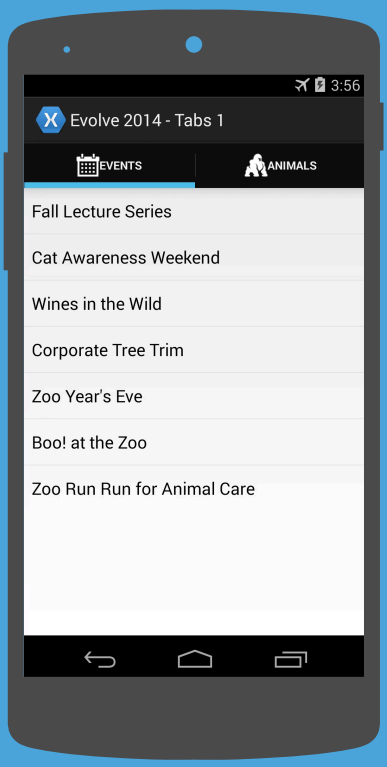


Tab Navigation

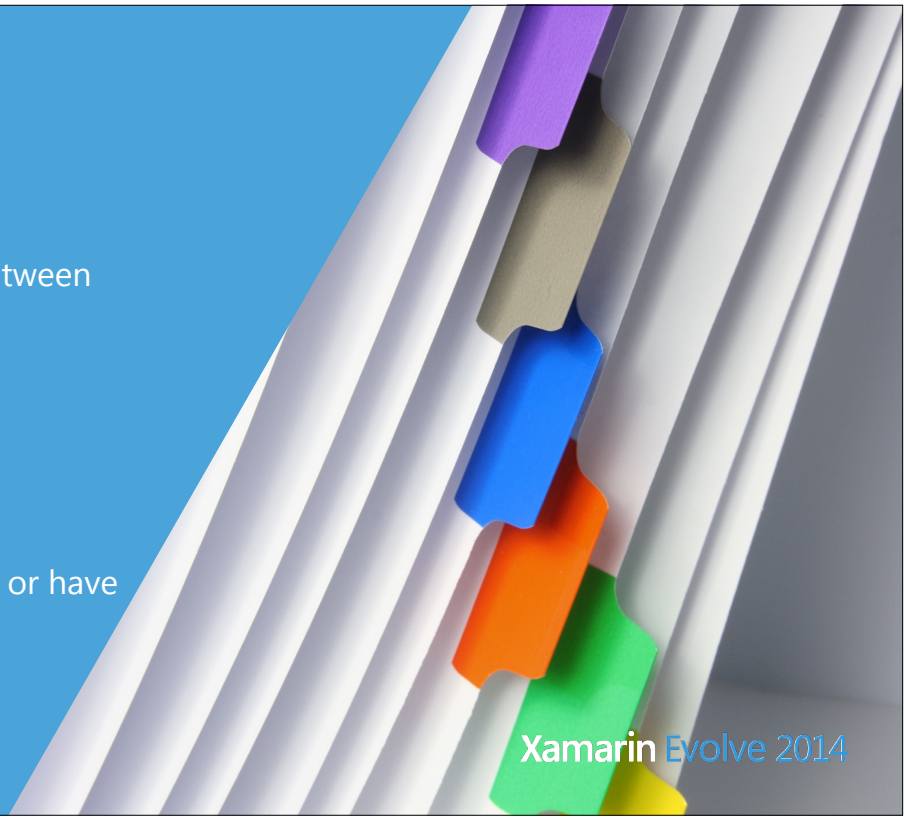
Demo



Tab Navigation

The quick navigation

- Quick, persistent navigation between application functionality
- Intended for 3-4 content tabs
- Will need to target Android 4+ or have the support library installed



Tab Navigation

Required Steps

- Implement the ITabListener Interface
- Add tabs to our Action Bar
- Listen for tab switched tabs

Adding Tab Functionality

```
public class MainActivity : ActionBarActivity, ActionBar.ITabListener
{

  public void OnTabSelected (ActionBar.Tab tab, FragmentTransaction ft)
  {
    Log.Debug (Tag, "The tab {0} as been selected.", tab.Text);
  }

  public void OnTabUnselected (ActionBar.Tab tab, FragmentTransaction ft)
  {
    Log.Debug (Tag, "The tab {0} as been unselected.", tab.Text);
  }

  public void OnTabReselected (ActionBar.Tab tab, FragmentTransaction ft)
  {
    Log.Debug (Tag, "The tab {0} was re-selected.", tab.Text);
  }
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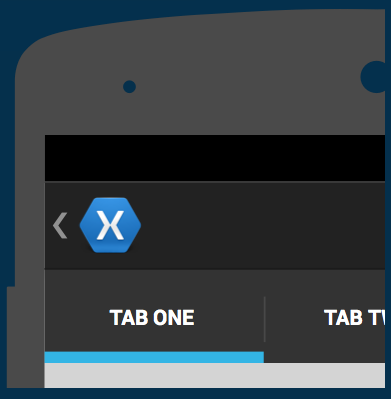
  }
```


Adding Tabs

```
void AddTabToActionBar (int labelResourceId, int iconResourceId)
{
  var tab =
    ActionBar.NewTab ()
        .SetText (labelResourceId)
        .SetIcon (iconResourceId)
        .SetTabListener (this);


  ActionBar.AddTab (tab);
}
```



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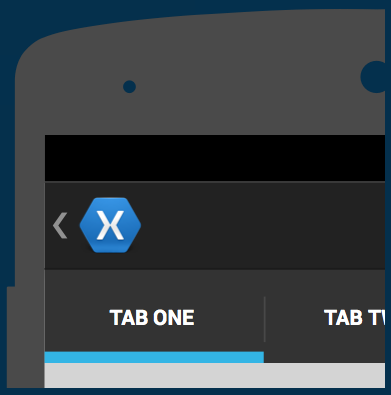

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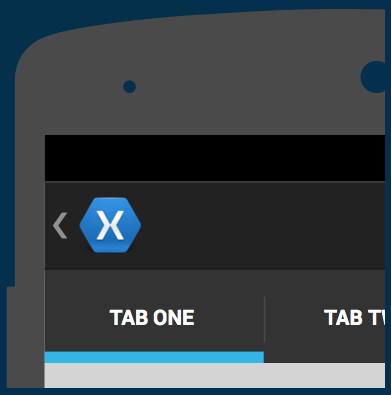

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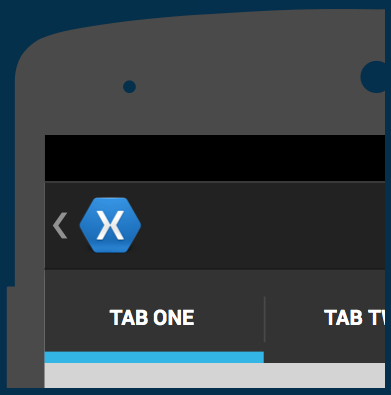

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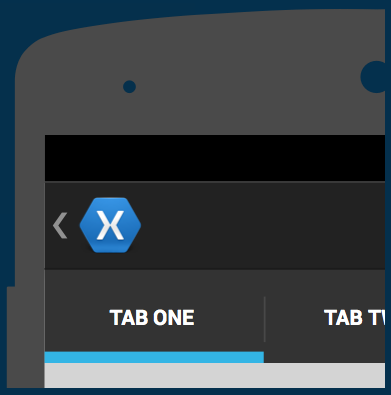

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Switching Tabs

```
public void OnTabReselected (ActionBar.Tab tab, FragmentTransaction ft)
{
  Log.Debug (Tag, "The tab {0} was re-selected.", tab.Text);
}

public void OnTabSelected (ActionBar.Tab tab, FragmentTransaction ft)
{
  SupportFragmentManager.PopBackStackImmediate ();

  Fragment frag = _fragments [tab.Position];
  ft.Replace (Resource.Id.content_frame, frag);

  Log.Debug (Tag, "The tab {0} has been selected.", tab.Text);
}

public void OnTabUnselected (ActionBar.Tab tab, FragmentTransaction ft)
{
  // perform any extra work associated with saving fragment state here.
  Log.Debug (Tag, "The tab {0} as been unselected.", tab.Text);
}
```


Demo

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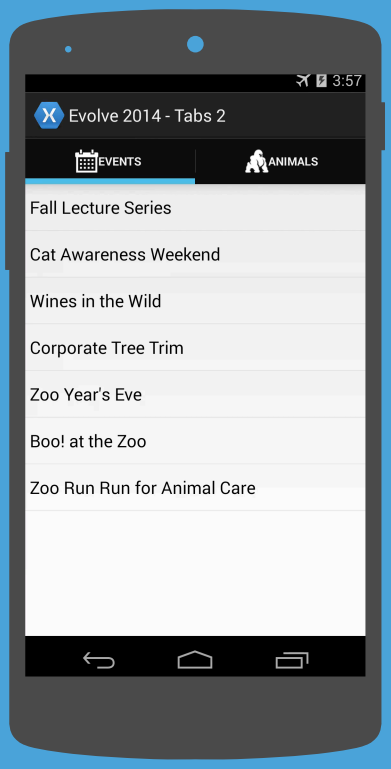

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ViewPager for Tabs

Required Steps

- Add a ViewPager element to your Layout XML
- Create an Adapter to host your different content
- Implement the IOnPageChangeListener Interface

Building a Better Tab Host

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.v4.view.ViewPager
  xmlns:android="http://schemas.android.com/apk/res/android"
    android:minWidth="25px"
    android:minHeight="25px"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:id="@+id/content_frame" />
```

Create a tab Adapter

```
class TabAdapter : FragmentStatePagerAdapter
{

  Fragment[] _fragments;

  public TabAdapter(FragmentManager fragmentManager) : base(fragmentManager){

    _fragments = new Fragment[] { /* List of Fragments */ } ;
  }

  public override int Count {
    get { return _fragments.Length; }
  }

  public override Fragment GetItem (int position)
  {
    if (position < 0 ||  position > _fragments.Length - 1)
      return null;

    return _fragments [position];
  }

}
```


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  {
    if (position < 0 ||  position > _fragments.Length - 1)
      return null;

    return _fragments [position];
  }

}
```

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Implement ViewPager in Activity

```
public class MainActivity : ActionBarActivity, ActionBar.ITabListener, ViewPager.IOnPageChangeListener
{

  public void OnPageScrollStateChanged (int state)
  {
  }

  public void OnPageScrolled (int position, float positionOffset, int positionOffsetPixels)
  {
  }

  public void OnPageSelected (int position)
  {
    ActionBar.SetSelectedNavigationItem (position);
  }
```


Implement ViewPager in Activity

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  {
  }

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  {
  }

  public void OnPageSelected (int position)
  {
    ActionBar.SetSelectedNavigationItem (position);
  }
```

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Update the Tab Listeners

```
public void OnTabSelected (ActionBar.Tab tab, FragmentTransaction ft)
{
  viewPager.SetCurrentItem (tab.Position, true);
}
```


Navigation Drawer

Demo

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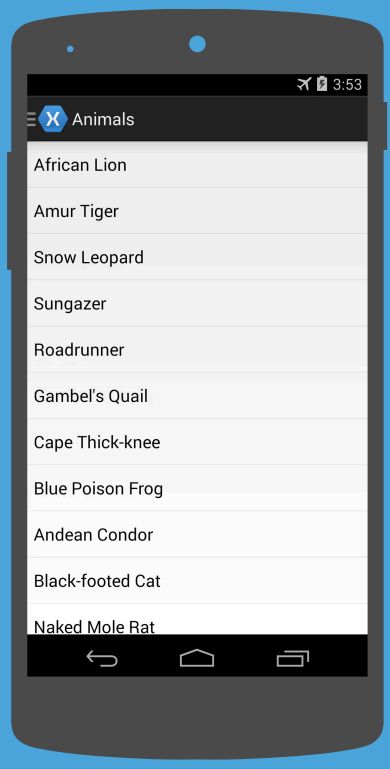

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Navigation Drawer

The hidden navigation

- Fast, non-intrusive navigation between main application pages
- Intended for 3+ main pages
- Can be used for navigation and for contextual menus

Navigation Drawer

Required Steps

- Update our application's layout to support a navigation drawer
- Configure the navigation drawer in our activity
- Synchronize our Navigation Drawer
- Respond to drawer selections

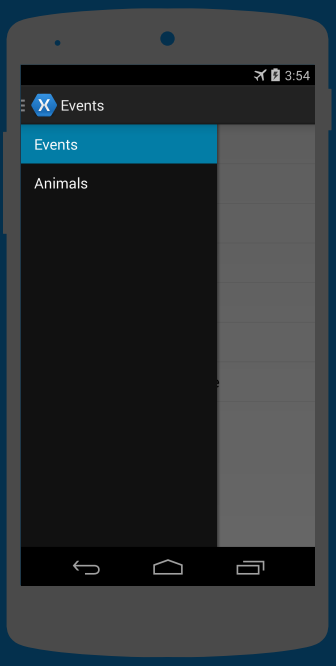
Layout Setup

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.v4.widget.DrawerLayout
  xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:local="http://schemas.android.com/apk/res-auto"
    android:id="@+id/drawer_layout"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <FrameLayout
        android:id="@+id/content_frame"
        android:layout_width="match_parent"
        android:layout_height="match_parent" />

    <ListView
        android:id="@+id/flyout"
        android:divider="@android:color/transparent"
        android:dividerHeight="0dp"
        android:choiceMode="singleChoice"
        android:layout_width="240dp"
        android:layout_height="match_parent"
        android:layout_gravity="start"
        android:background="#111" />

</android.support.v4.widget.DrawerLayout>
```



Layout Setup

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.v4.widget.DrawerLayout
  xmlns:android="http://schemas.android.com/apk/res/android"
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    android:id="@+id/drawer_layout"
    android:layout_width="match_parent"
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    <FrameLayout
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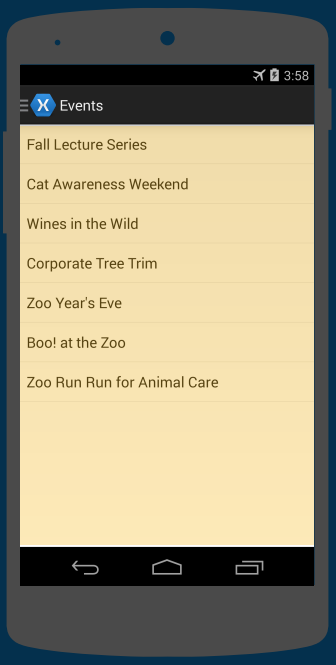

Layout Setup

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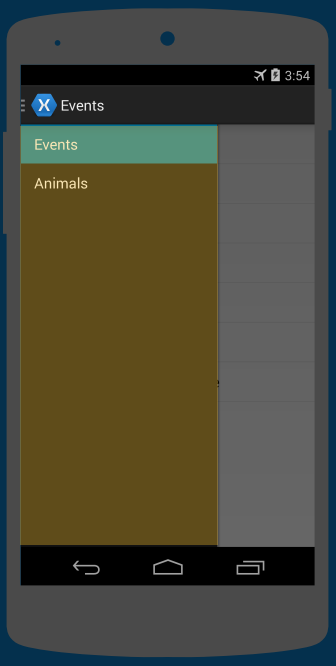
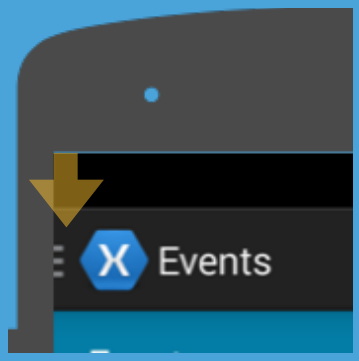


Drawer Setup

```
public class MainActivity : ActionBarActivity, IFragmentNavigation
{
  DrawerLayout drawerLayout;
  ActionBarDrawerToggle drawerToggle;

  protected override void OnCreate (Bundle bundle)
  {
    base.OnCreate (bundle);
    SetContentView (Resource.Layout.Main);

    drawerLayout = FindViewById<DrawerLayout> (Resource.Id.drawer_layout);

    drawerToggle = new ActionBarDrawerToggle (this,
      drawerLayout, Resource.Drawable.ic_drawer,
      Resource.String.drawer_open, Resource.String.drawer_close);

    drawerLayout.SetDrawerShadow (Resource.Drawable.drawer_shadow, (int)GravityFlags.Start);

    drawerLayout.SetDrawerListener (drawerToggle);
```

Navigation Drawer

Closed



Open

Drawer Setup

```
protected override void OnCreate (Bundle bundle)
{
  base.OnCreate (bundle);
  SetContentView (Resource.Layout.Main);

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    Resource.String.drawer_open, Resource.String.drawer_close);

  drawerLayout = FindViewById<DrawerLayout> (Resource.Id.drawer_layout);
  drawerLayout.SetDrawerShadow (Resource.Drawable.drawer_shadow, (int)GravityFlags.Start);
  drawerList = FindViewById<ListView> (Resource.Id.flyout);
  drawerList.Adapter = new ArrayAdapter<string> (this, Resource.Layout.drawer_list_item, sections);


  drawerLayout.SetDrawerListener (drawerToggle);
```
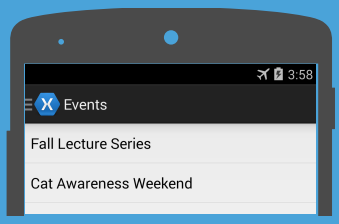
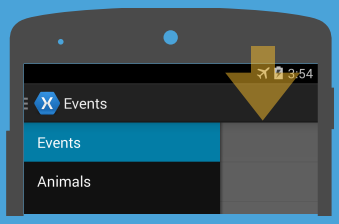



Closed



Open

Drawer Setup

```
protected override void OnCreate (Bundle bundle)
{
  base.OnCreate (bundle);
  SetContentView (Resource.Layout.Main);

  drawerToggle = new ActionBarDrawerToggle (this,
    drawerLayout, Resource.Drawable.ic_drawer,
    Resource.String.drawer_open, Resource.String.drawer_close);

  drawerLayout = FindViewById<DrawerLayout> (Resource.Id.drawer_layout);
  drawerLayout.SetDrawerShadow (Resource.Drawable.drawer_shadow, (int)GravityFlags.Start);
  drawerList = FindViewById<ListView> (Resource.Id.flyout);
  drawerList.Adapter = new ArrayAdapter<string> (this, Resource.Layout.drawer_list_item, sections);


  drawerLayout.SetDrawerListener (drawerToggle);
```

Make sure the Action Bar is Enabled

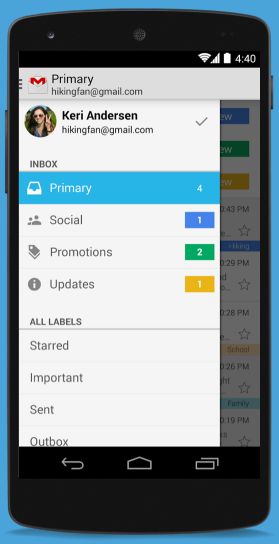
```
  drawerToggle = new ActionBarDrawerToggle (this,
    drawerLayout, Resource.Drawable.ic_drawer,
    Resource.String.drawer_open, Resource.String.drawer_close);

  drawerLayout.SetDrawerListener (drawerToggle);

  drawerList.ItemClick += (object sender, AdapterView.ItemClickEventArgs e) => ListItemClicked
(e.Position);
  ListItemClicked (0);

  ActionBar.SetDisplayHomeAsUpEnabled (true);
  ActionBar.SetHomeButtonEnabled (true);
}
```


Responding to Selections

```
public override bool OnOptionsItemSelected (IMenuItem item)
{
  if(drawerToggle.DrawerIndicatorEnabled && drawerToggle.OnOptionsItemSelected(item))
    return true;

    return base.OnOptionsItemSelected (item);
}
```

Quick Tips

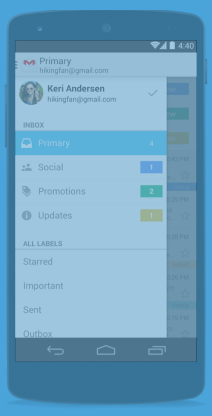
- On first run, consider starting your app with the Navigation Drawer displayed
- Make your drawer listings descriptive
  - Icons
  - Images
  - Counters
- The Android Developer Center has Navigation Drawer Icons



Common Android Navigation Patterns

Stack Navigation

Tab Navigation

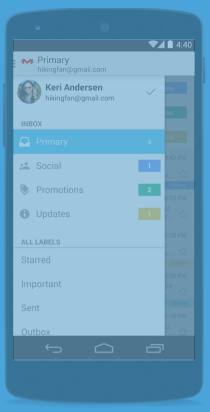


Navigation Drawer

Common Android Navigation Patterns

Stack Navigation

Tab Navigation



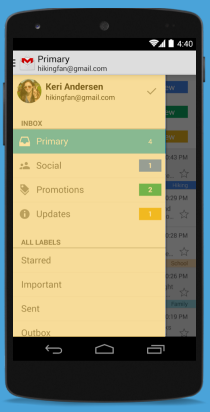
Navigation Drawer

Xamarin Evolve 2014

Common Android Navigation Patterns

Stack Navigation

Tab Navigation



Navigation Drawer

Xamarin Evolve 2014

Questions?

Xamarin Evolve 2014

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Homeward Bound: Implementing Android Navigation Patterns

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