Loader

35

SQLite   RunTracker   Cursor

Loader   loader

API   Android 3.0   Honeycomb

35.1 Loader   LoaderManager

Loader
ContentProvider   loader

loader   Loader AsyncTaskLoader CursorLoader   35-1
    Loader   LoaderManager   loader   API
  AsyncTaskLoader   Loader   AsyncTask
                loader   AsyncTaskLoader
            CursorLoader   AsyncTaskLoader   ContentResolver
  ContentProvider   Cursor   RunTracker   CursorLoader
    SQLiteDatabase   cursor
    LoaderManager   loader   Loader
            Activity Fragment   getLoaderManager()

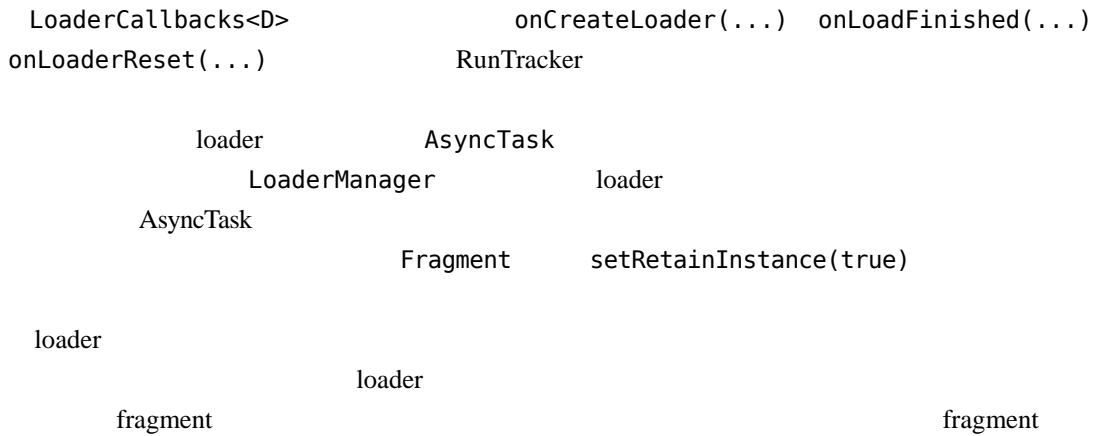   Loader   initLoader(int, Bundle, LoaderCallbacks<D>)
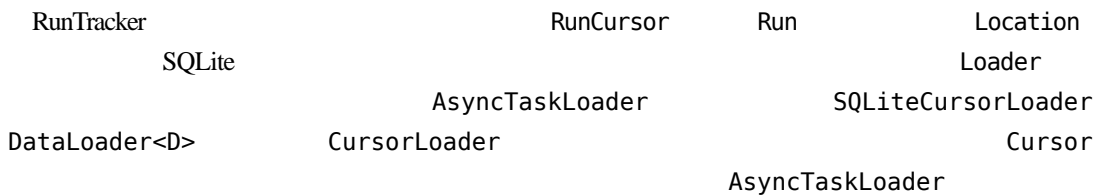   loader   Bundle
    LoaderCallbacks<D>
LoaderCallbacks   Fragment
            loader   restartLoader(int, Bundle, LoaderCallbacks<D>)

<div style="text-align:center">35-1   Loader</div>

LoaderCallbacks<D>   onCreateLoader(...) onLoadFinished(...)
onLoaderReset(...)   RunTracker

                    loader   AsyncTask
                    LoaderManager   loader
AsyncTask
                            Fragment   setRetainInstance(true)

    loader
                    loader
    fragment   fragment

35.2   让 RunTracker 继续使用 Loader 加载数据

RunTracker   RunCursor   Run   Location
            SQLite   Loader
                            AsyncTaskLoader   SQLiteCursorLoader
DataLoader<D>   CursorLoader   Cursor
                                            AsyncTaskLoader

35.3

RunListFragment   onCreate(Bundle)   RunManager
         RunCursor   loader
RunListFragment   LoaderManager   loader   LoaderCallbacks

        RunListFragment   35-1
        SQLiteCursorLoader   AsyncTaskLoader   CursorLoader
                            ContentProvider

35-1   SQLite cursor   loader   SQLiteCursorLoader.java

```java
public abstract class SQLiteCursorLoader extends AsyncTaskLoader<Cursor> {
    private Cursor mCursor;

    public SQLiteCursorLoader(Context context) {
        super(context);
    }

    protected abstract Cursor loadCursor();

    @Override
    public Cursor loadInBackground() {
        Cursor cursor = loadCursor();
        if (cursor != null) {
            // Ensure that the content window is filled
            cursor.getCount();
        }
        return cursor;
    }

    @Override
    public void deliverResult(Cursor data) {
        Cursor oldCursor = mCursor;
        mCursor = data;

        if (isStarted()) {
            super.deliverResult(data);
        }

        if (oldCursor != null && oldCursor != data && !oldCursor.isClosed()) {
            oldCursor.close();
        }
    }

    @Override
    protected void onStartLoading() {
        if (mCursor != null) {
            deliverResult(mCursor);
        }
        if (takeContentChanged() || mCursor == null) {
            forceLoad();
```

```
        }
    }

    @Override
    protected void onStopLoading() {
        // Attempt to cancel the current load task if possible.
        cancelLoad();
    }

    @Override
    public void onCanceled(Cursor cursor) {
        if (cursor != null && !cursor.isClosed()) {
            cursor.close();
        }
    }

    @Override
    protected void onReset() {
        super.onReset();

        // Ensure the loader is stopped
        onStopLoading();

        if (mCursor != null && !mCursor.isClosed()) {
            mCursor.close();
        }
        mCursor = null;
    }

}
```

　　　　AsyncTaskLoaderAPI　　　　　　SQLiteCursorLoader　　　　　　　　Cursor
mCursor　　　　　　　loadInBackground()　　　　loadCursor()　　　　　　Cursor
　　　cursor　getCount()
　deliverResult(Cursor)　　　　　　　　　　　　　loader
　　　　　deliverResult(...)　　　　　　　　cursor
　　　　cursor　　　　　　　　　　　　　cursor　　　　　　cursor

　　　RunTracker　　　　　　　　　　　　　　　　　　　　Android API
　　　AsyncTaskLoader
　　SQLiteCursorLoader　　　　　　　RunListFragment
RunListCursorLoader　　　　　　35-2

<div style="background:#dddddd">

　　35-2　　　RunListCursorLoader　RunListFragment.java
</div>

```
@Override
public void onListItemClick(ListView l, View v, int position, long id) {
    // The id argument will be the Run ID; CursorAdapter gives us this for free
    Intent i = new Intent(getActivity(), RunActivity.class);
    i.putExtra(RunActivity.EXTRA_RUN_ID, id);
    startActivity(i);
}
```

```
    private static class RunListCursorLoader extends SQLiteCursorLoader {

        public RunListCursorLoader(Context context) {
            super(context);
        }

        @Override
        protected Cursor loadCursor() {
            // Query the list of runs
            return RunManager.get(getContext()).queryRuns();
        }

    }
```

private static class RunCursorAdapter extends CursorAdapter {

RunListFragment   LoaderCallbacks<Cursor>

35-3   LoaderCallbacks

35-3	LoaderCallbacks<Cursor>	RunListFragment.java

```
public class RunListFragment extends ListFragment implements LoaderCallbacks<Cursor> {

    ...

    @Override
    public Loader<Cursor> onCreateLoader(int id, Bundle args) {
        // You only ever load the runs, so assume this is the case
        return new RunListCursorLoader(getActivity());
    }

    @Override
    public void onLoadFinished(Loader<Cursor> loader, Cursor cursor) {
        // Create an adapter to point at this cursor
        RunCursorAdapter adapter =
            new RunCursorAdapter(getActivity(), (RunCursor)cursor);
        setListAdapter(adapter);
    }

    @Override
    public void onLoaderReset(Loader<Cursor> loader) {
        // Stop using the cursor (via the adapter)
        setListAdapter(null);
    }
```

loader   LoaderManager   onCreateLoader(int, Bundle)

loader   id   Bundle

onCreateLoader(int, Bundle)

  Activity RunListCursorLoader

                    onLoadFinished(Loader<Cursor>, Cursor)

                ListView adapter   cursor RunCursorAdapter

                onLoaderReset(Loader<Cursor>)

        adapter   cursor

35

LoadManager   mCursor

mCursor   onDestroy()   35-4

35-4   Loader   RunListFragment.java

```java
public class RunListFragment extends ListFragment implements LoaderCallbacks<Cursor> {
    private static final int REQUEST_NEW_RUN = 0;


    private RunCursor mCursor;

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setHasOptionsMenu(true);
        // Query the list of runs
        mCursor = RunManager.get(getActivity()).queryRuns();
        // Create an adapter to point at this cursor
        RunCursorAdapter adapter = new RunCursorAdapter(getActivity(), mCursor);
        setListAdapter(adapter);
        // Initialize the loader to load the list of runs
        getLoaderManager().initLoader(0, null, this);
    }

    ...

    @Override
    public void onDestroy() {
        mCursor.close();
        super.onDestroy();
    }


    ...

    @Override
    public void onActivityResult(int requestCode, int resultCode, Intent data) {
        if (REQUEST_NEW_RUN == requestCode) {
            mCursor.requery();
            ((RunCursorAdapter)getListAdapter()).notifyDataSetChanged();
            // Restart the loader to get any new run available
            getLoaderManager().restartLoader(0, null, this);
        }
    }
}
```

ListFragment

adapter

35.4

SQLiteCursorLoader   cursor

RunFragment   RunManager   cursor

loader

AsyncTaskLoader   DataLoader   DataLoader
AsyncTaskLoader   loadInBackground()

            35-5   DataLoader

35-5   loader   DataLoader.java

```java
public abstract class DataLoader<D> extends AsyncTaskLoader<D> {
    private D mData;

    public DataLoader(Context context) {
        super(context);
    }

    @Override
    protected void onStartLoading() {
        if (mData != null) {
            deliverResult(mData);
        } else {
            forceLoad();
        }
    }

    @Override
    public void deliverResult(D data) {
        mData = data;
        if (isStarted())
            super.deliverResult(data);
    }

}
```

DataLoader   D   onStartLoading()
                                         forceLoad()

deliverResult(D)   loader

        DataLoader   RunLoader   RunFragment
    35-6

35-6   loader   RunLoader.java

```java
public class RunLoader extends DataLoader<Run> {
    private long mRunId;

    public RunLoader(Context context, long runId) {
        super(context);
        mRunId = runId;
    }

    @Override
    public Run loadInBackground() {
        return RunManager.get(getContext()).getRun(mRunId);
    }
}
```

35

RunLoader   Context   Activity   long   ID
loadInBackground()   RunManager   ID
                RunFragment   RunLoader   RunManager

    RunFragment   LoaderCallbacks<D>
      Java   RunFragment   Run
  Location   LoaderCallbacks
  LoaderManager   initLoader(...)
                                RunFragment   RunLoaderCallbacks
    35-7

```java
private class RunLoaderCallbacks implements LoaderCallbacks<Run> {

    @Override
    public Loader<Run> onCreateLoader(int id, Bundle args) {
        return new RunLoader(getActivity(), args.getLong(ARG_RUN_ID));
    }

    @Override
    public void onLoadFinished(Loader<Run> loader, Run run) {
        mRun = run;
        updateUI();
    }

    @Override
    public void onLoaderReset(Loader<Run> loader) {
        // Do nothing
    }
}
```

    onCreateLoader(int, Bundle)   RunLoader   fragment
activity   bundle   ID   bundle   onCreate (Bundle)
  onLoadFinished(...)   fragment   mRun
updateUI()
    Run   onLoaderReset(...)
            RunFragment onCreate(Bundle)   LoaderManager
                LoaderManager   loader   LOAD_RUN
loader   ID   35-8

```java
public class RunFragment extends Fragment {
    private static final String TAG = "RunFragment";
    private static final String ARG_RUN_ID = "RUN_ID";
    private static final int LOAD_RUN = 0;
```

```
        ...

        @Override
        public void onCreate(Bundle savedInstanceState) {
            super.onCreate(savedInstanceState);
            setRetainInstance(true);
            mRunManager = RunManager.get(getActivity());

            // Check for a Run ID as an argument, and find the run
            Bundle args = getArguments();
            if (args != null) {
                long runId = args.getLong(ARG_RUN_ID, -1);
                if (runId != -1) {
                    mRun = mRunManager.getRun(runId);
                    LoaderManager lm = getLoaderManager();
                    lm.initLoader(LOAD_RUN, args, new RunLoaderCallbacks());
                }
            }
        }
```

RunTracker

35.5

LastLocationLoader   35-9

35-9   LastLocationLoader   LastLocationLoader.java

```
public class LastLocationLoader extends DataLoader<Location> {
    private long mRunId;

    public LastLocationLoader(Context context, long runId) {
        super(context);
        mRunId = runId;
    }

    @Override
    public Location loadInBackground() {
        return RunManager.get(getContext()).getLastLocationForRun(mRunId);
    }

}
```

ID   RunManager   getLastLocationForRun(long)

RunLoader

RunFragment   LocationLoaderCallbacks   35-10

35-10   LocationLoaderCallbacks   RunFragment.java

```
private class LocationLoaderCallbacks implements LoaderCallbacks<Location> {

    @Override
    public Loader<Location> onCreateLoader(int id, Bundle args) {
        return new LastLocationLoader(getActivity(), args.getLong(ARG_RUN_ID));
    }

    @Override
    public void onLoadFinished(Loader<Location> loader, Location location) {
        mLastLocation = location;
        updateUI();
    }

    @Override
    public void onLoaderReset(Loader<Location> loader) {
        // Do nothing
    }
}
```

LocationLoaderCallbacks   RunLoaderCallbacks

UI   mLastLocation   onCreate(Bundle)

RunManager   loader ID (LOAD_LOCATION)   loader LastLocationLoader ,

35-11

35-11   RunFragment.java

```
public class RunFragment extends Fragment {
    private static final String TAG = "RunFragment";
    private static final String ARG_RUN_ID = "RUN_ID";
    private static final int LOAD_RUN = 0;
    private static final int LOAD_LOCATION = 1;
    ...

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setRetainInstance(true);
        mRunManager = RunManager.get(getActivity());

        // Check for a Run ID as an argument, and find the run
        Bundle args = getArguments();
        if (args != null) {
            long runId = args.getLong(ARG_RUN_ID, -1);
            if (runId != -1) {
                LoaderManager lm = getLoaderManager();
                lm.initLoader(LOAD_RUN, args, new RunLoaderCallbacks());
                mLastLocation = mRunManager.getLastLocationForRun(runId);
                lm.initLoader(LOAD_LOCATION, args, new LocationLoaderCallbacks());
            }
        }
    }
```

RunTracker   loader