

DSP Group Inc. (NASDAQ: DSPG)



# Real-Life Execution Android API – Enhancing CAT-iq



Fredy Rabi

CAT-iq Developers Conference 2011

# Outline

- **The Android Cordless Phone**
- **Introduction to Android**
- **DECT integration into Android**
- **CAT-iq and DECT Telephony API**

# Multimedia Cordless Phones – The New Wave of Cordless Phones

- It is a cordless phones
- With touch & intuitive operation
- Integrates Wi-Fi & DECT on the same device
- Integrates Voice, data, audio and video
- Open platform based on Android



# What is Android?

- Android
  - Open, free software platform for mobile devices with a complete software stack
    - Operating system
    - Middleware
    - Key mobile applications
  - Based on Linux operating system
  - Made available as open source via the Apache v2 license
    - Industry can add proprietary functionality to their products without giving anything back to the platform
    - Companies can remove functionality if they choose
  - Since it's open source, it can be liberally extended as new technologies emerge

# Advantages of an Open Platform

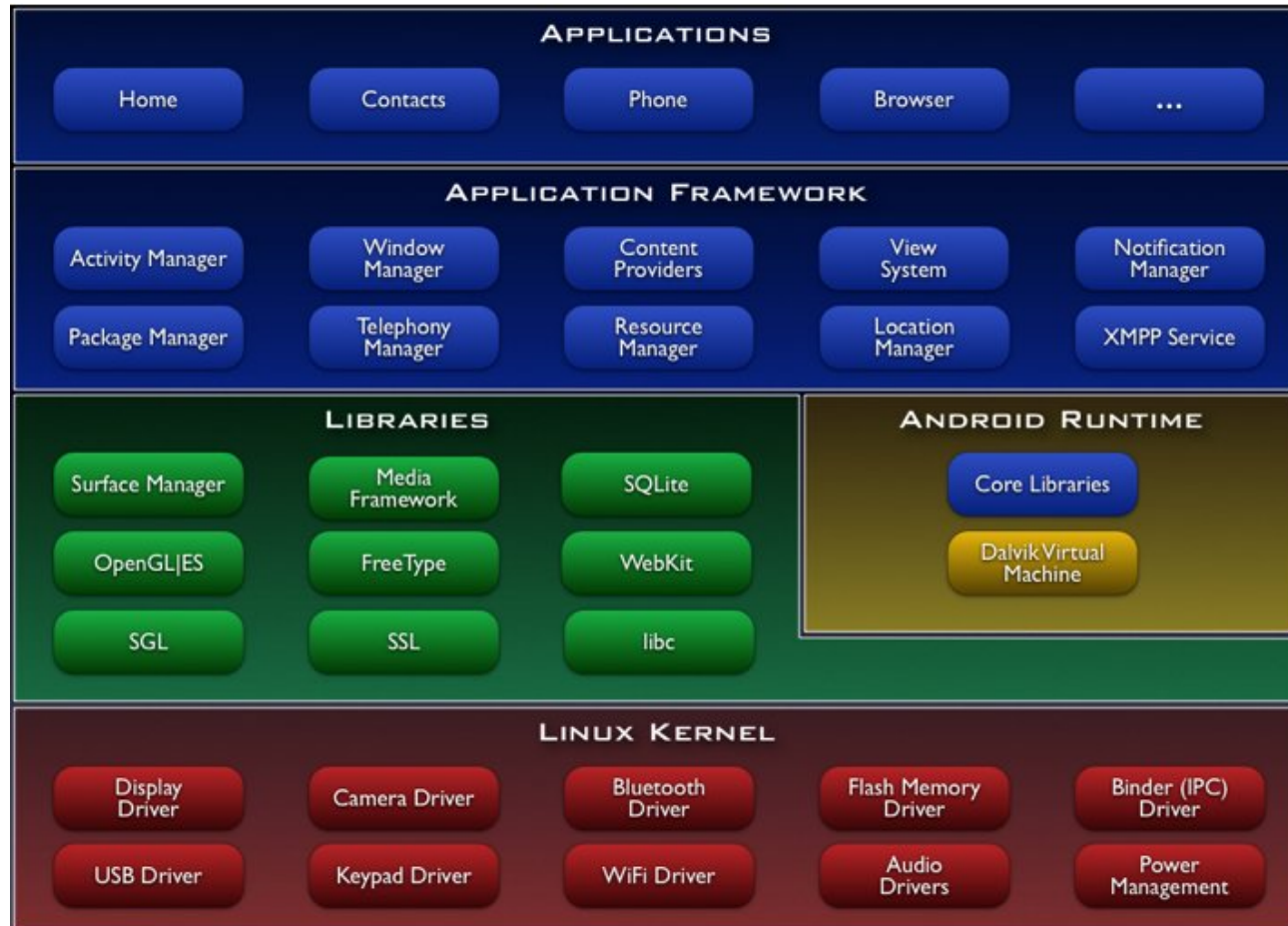
Android is...Open

- Operators
  - They will have complete flexibility to customize and differentiate their product lines
  - More rapid innovation in handsets and services
- Handset manufacturers
  - Faster time-to-market for handset
  - Greater flexibility to customized and differentiate product offerings
- Developers
  - Able to innovate rapidly because they will have comprehensive API access to handset capabilities that are web-ready
  - Increase productivity
    - Comprehensive and easy-to-use developer tools
  - Distribution and commercialization of applications will be less expensive and easier

# Android Features

- **Application framework**
  - enable reuse and replacement of components
- **Dalvik virtual machine**
  - optimized for mobile devices
- **Integrated browser**
  - based on the open source WebKit engine
- **Optimized graphics**
  - powered by a custom 2D graphics library
  - 3D graphics based on the OpenGL ES specification (hardware acceleration optional)
- **SQLite**
  - For structured data storage
- **Media support** for common audio, video, and still image formats
  - MPEG4, H.264, MP3, AAC, AMR, JPG, PNG, GIF
- **GSM Telephony** (hardware dependent)
- **Bluetooth, EDGE, 3G, and Wi-Fi** (hardware dependent)
- **Camera, GPS, compass, and accelerometer** (hardware dependent)

# Android Architecture



Major components of the Android OS

# Application Framework

Android Architecture

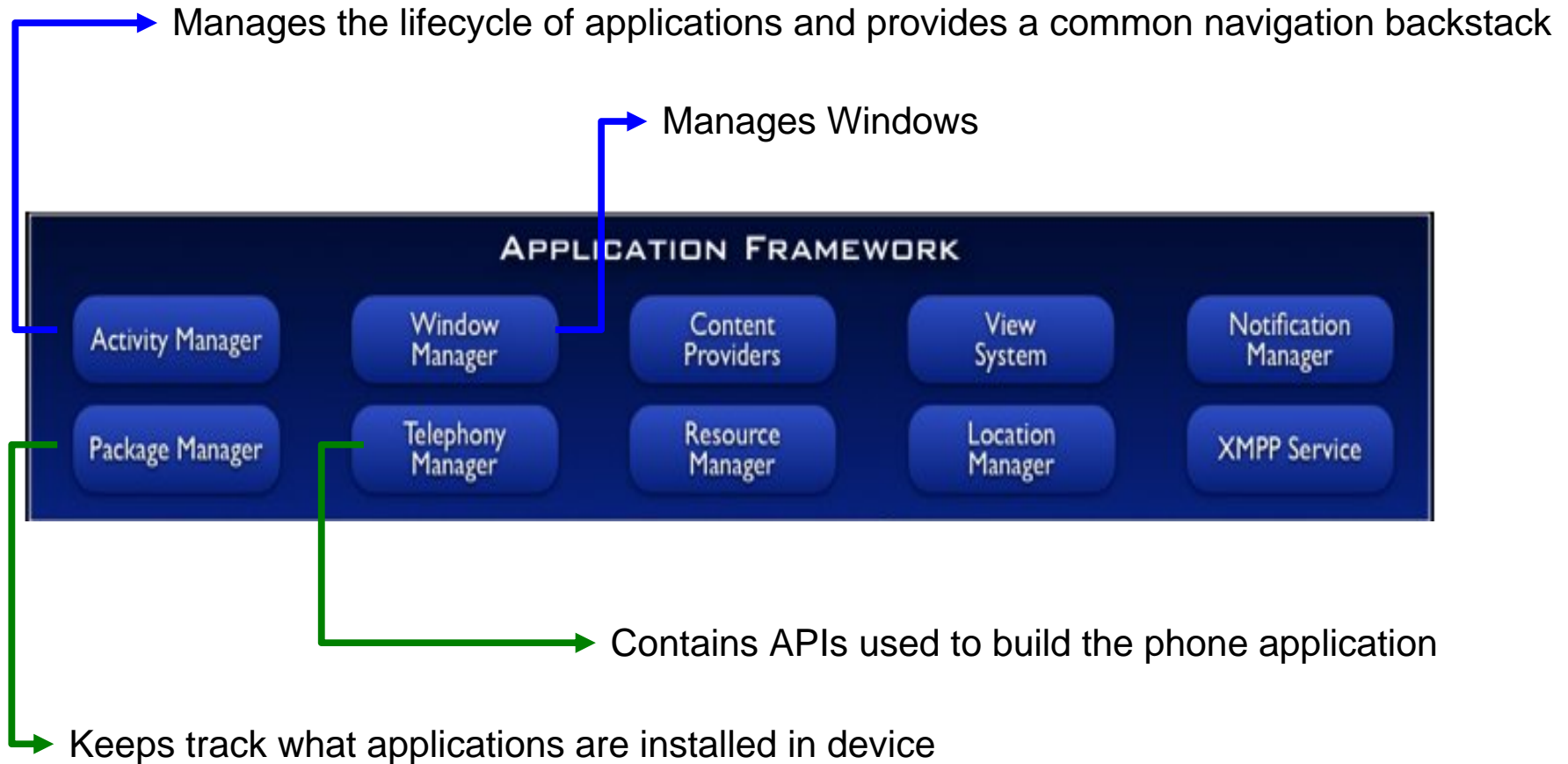
- Toolkit that all applications (core, by Google, ...)



**All written using the Java programming language**

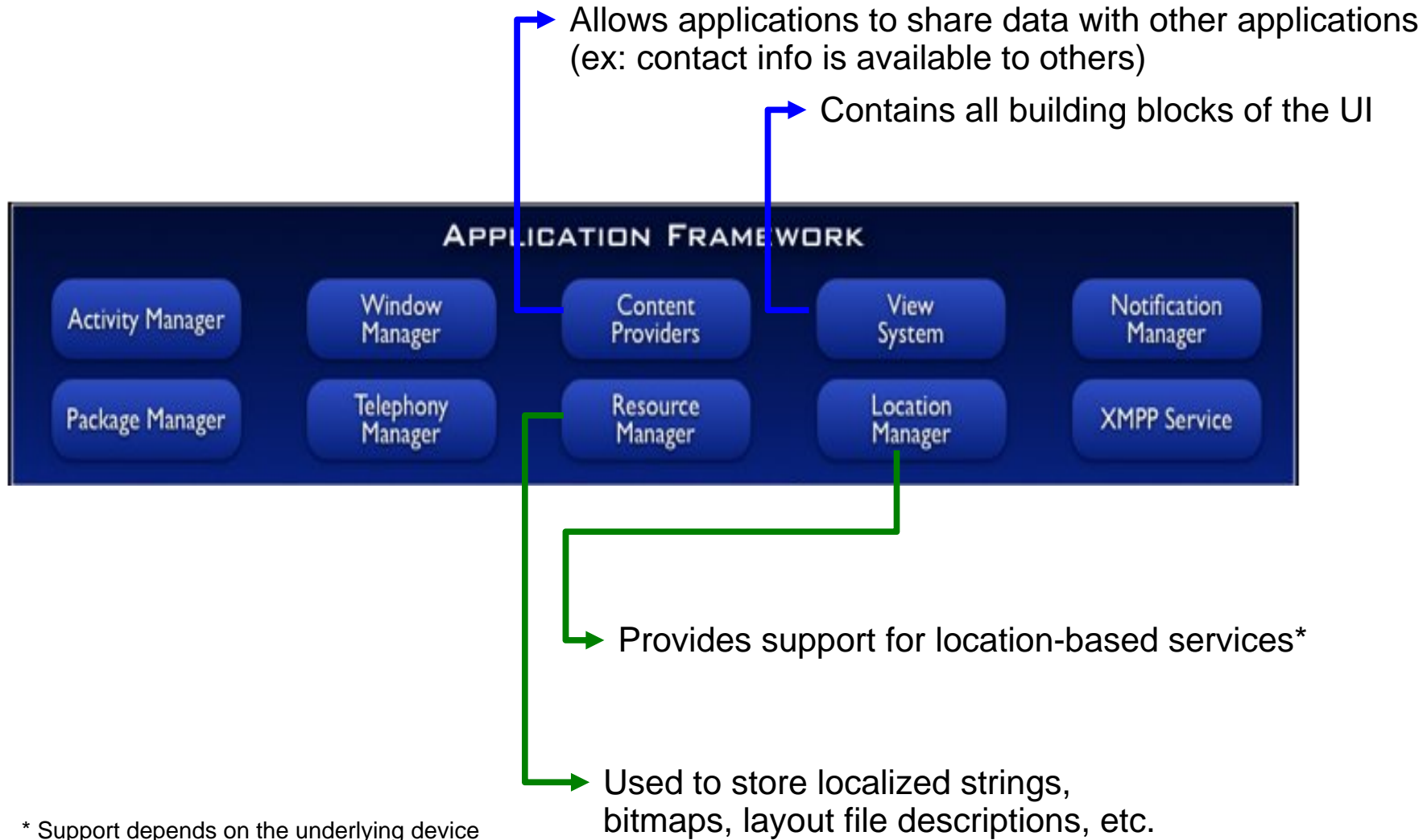
# Application Framework

Android Architecture



# Application Framework

Android Architecture



\* Support depends on the underlying device

# Application Framework

Android Architecture

Handles notification of users about events that happen

Examples of notification forms: persistent icon in the status bar, vibrating, playing sound, etc.)



Allows applications to communicate between devices through **GtalkService**.  
**GtalkService** maintains a persistent socket connection, therefore the response time is faster than SMS.

# Applications

Android Architecture



- Core Applications

- Desk Clock
- Browser
- Calendar
- Calculator
- Contacts
- Email
- Gallery
- GlobalSearch
- Launcher
- Music
- Settings

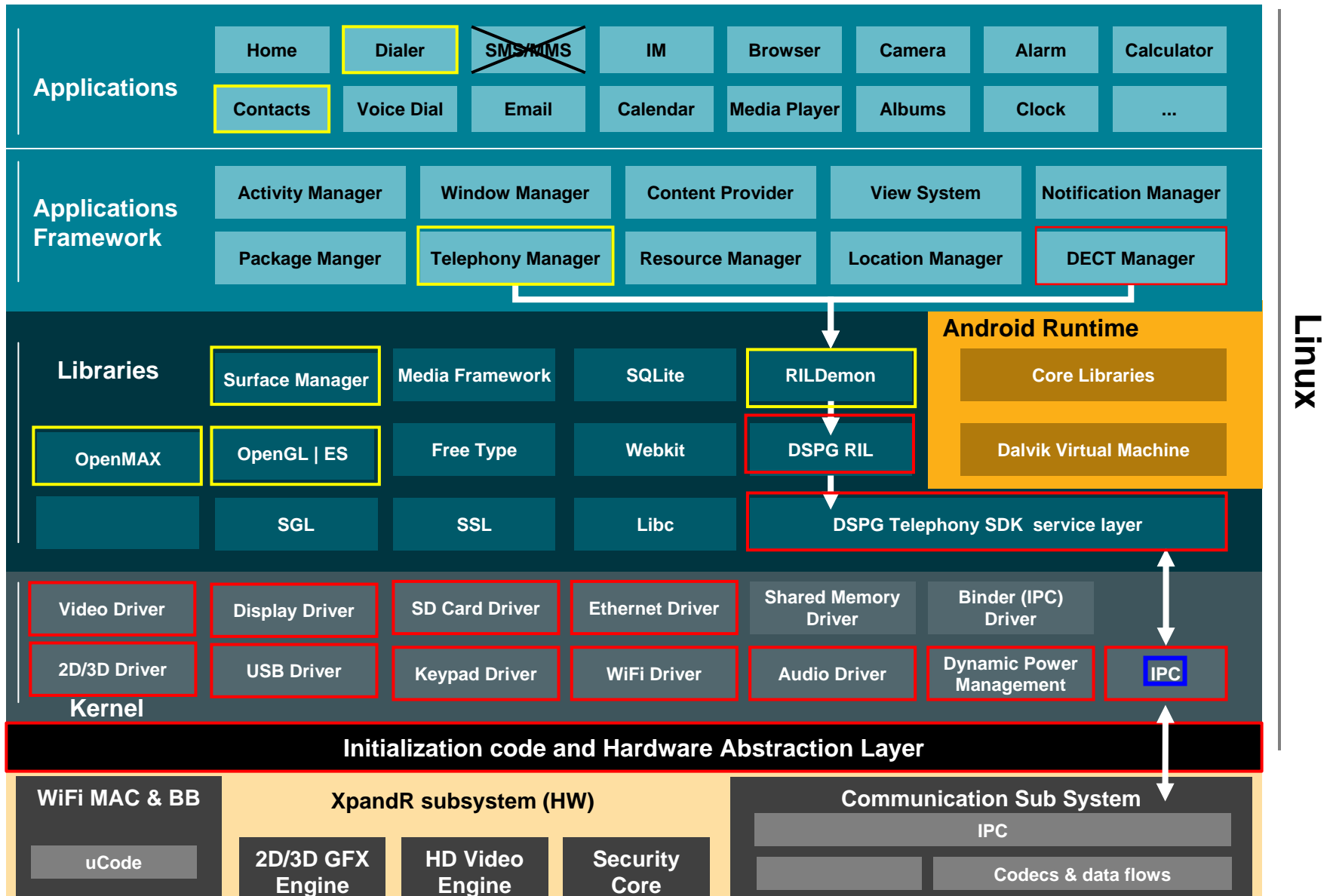
**All written using the Java programming language**

# What is RIL ?

- RIL is the abbreviation of Android's Radio Interface Layer (RIL),
- it provides **an abstraction layer** between Android telephony services ([android.telephony](#)) and radio hardware
- It consists of two primary components RIL Daemon and Vendor RIL
- **RIL Daemon**
  - it initializes the Vendor RIL,
  - and processes all communication from Android telephony services, and dispatches calls to the Vendor RIL as solicited commands
  - Solicited Request, all the request that sent by RILJ belong this category  
For example: dial, hung up send SMS
- **Vendor RIL**
  - It initialize the baseband device
  - and processes all communication with radio hardware and dispatches calls to the RIL Daemon (rild) through unsolicited commands
  - Unsolicited Request, the event that coming from outside. For example: incoming calling, MS change BS, signal strength

# DSP Group SDK Integration w/Android

- Legend:
- DSP Group changed
  - DSP Group Module



# DECT Integration with Android - Flavors

- Telephony uses DECT instead of GSM
- Telephony uses DECT in parallel to GSM
- Compatibility to Different DECT versions
  - GAP, Non CAT IQ, CAT IQ
- Support different Android flavors (versions)

# DECT DSP Group API Additions

- DECT Notifications:
  - HS number / Name – present as constant Icon
  - Current Base number – hidden in special screen
  - Missed call – synchronize with Base Missed call list (another HS may answer the call)
  - Remote Voice mail indications (HS may have different Voice mails (in Base, in Network, etc.)
  - Date/time synchronization by and from the Base



# DECT DSP Group API Additions

- Call & Dialing - Special aspects:
  - Intercom
  - Page calls, Intrude calls
  - Base Voice mail calls (inc. Call screen feature)
  - Post Dialing (support both PSTN and VOIP)
  - Special digits (“Flash”, Other special digits)
- Call logs / Contacts:
  - Remote database with CAT-iq base
  - Synchronize Local HS lists with Base Lists, and to enable Android application work with remote base lists



# DECT DSP Group API Additions

- DECT Settings API
  - Handset settings (stand alone)
    - Registration to base / multi bases
    - Move from Base to base (synch to other base)
  - Base settings (affecting the base)
    - Control various Base parameters (rings, dialing parameters, and many other )
    - Reset base
    - Base version
    - De-register of another HS
  - Authentication method towards base database



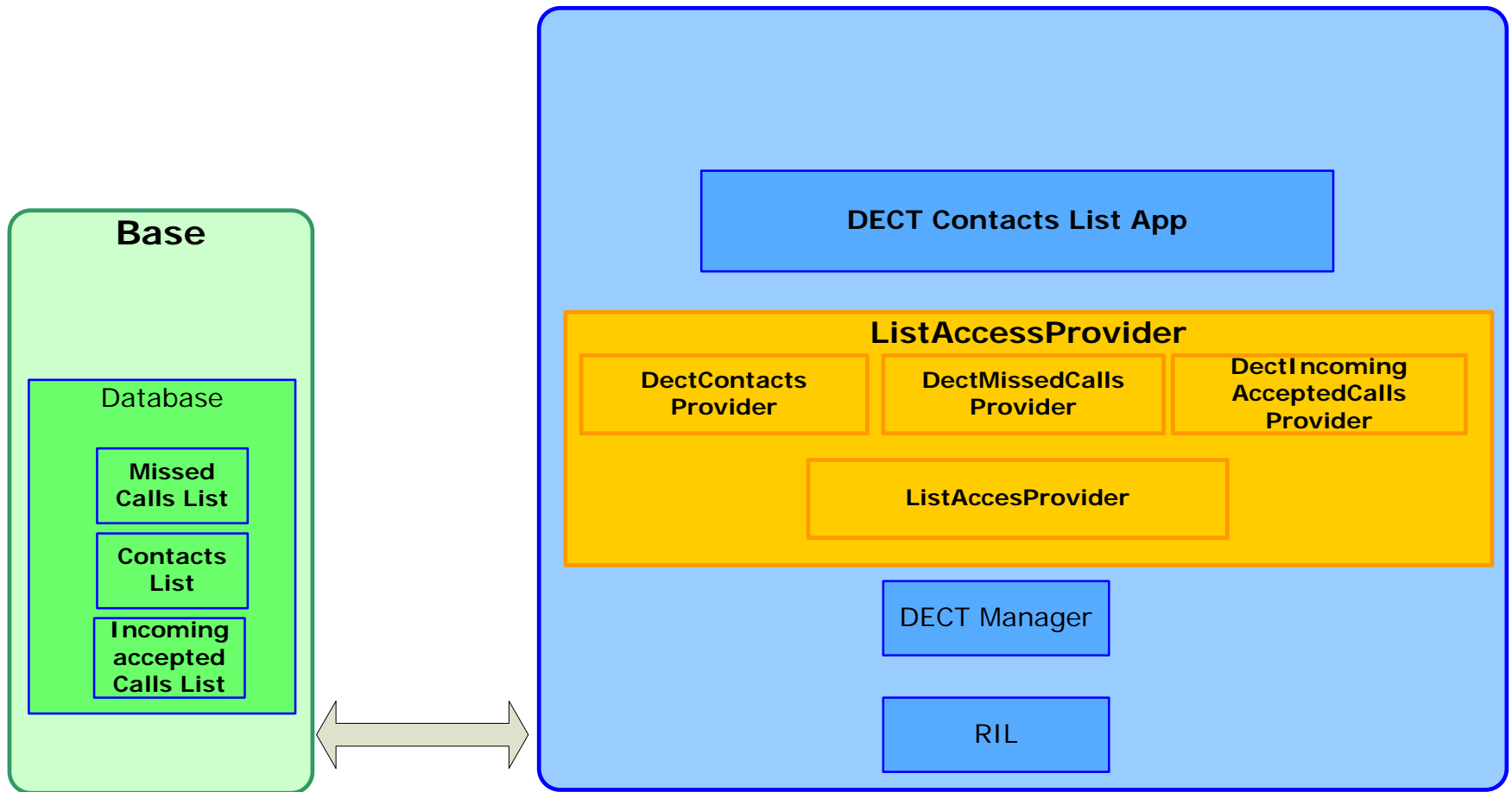
# Example:

## Application Interface of List Access Provider

- The ListAccessProvider API gives the application developer a way to access the DECT base database remotely in a standard way, defined by Android ContentProvider interface
- The DECT CAT-iq 2.0 base holds several mandatory lists (and might support also proprietary ones) such as Contacts, Incoming accepted calls and Missed calls
- The ListAccessProvider abstracts the CAT-iq 2.0 ListAccess protocol, so that the application developer can avoid the effort of learning the complexity and details of it
- The ListAccess provider follows most of the rules defined by Android for Content providers

# List Access Provider Module

(part of Content Providers)



# Applications Examples

- DECT Stand Alone
- DECT & Wi-Fi integrative applications
  - Voice mail in Base, VM GUI in Handset
  - Record Calls into Mail box (in Base or in HS)
  - Manage blacklist
  - Ideas to integrate DECT telephony capabilities with WiFi Network connectivity:
    - Record a call and send by Email
    - Base data-base to be controlled from WiFi
    - Send notifications by Mail
    - Phonebook synchronization
    - Etc...

# Summary

- Android Cordless phones are available
- We shall encourage Android developers develop DECT/CAT-iq telephony applications
  - Open CAT-iq/DECT API

# Thank You