TOPIC :*Android Operating System*

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Android Operating System

- **Introduction of Android**

- **History of Android**

- **Versions of Android**

- **Features of Android**

- **Security**
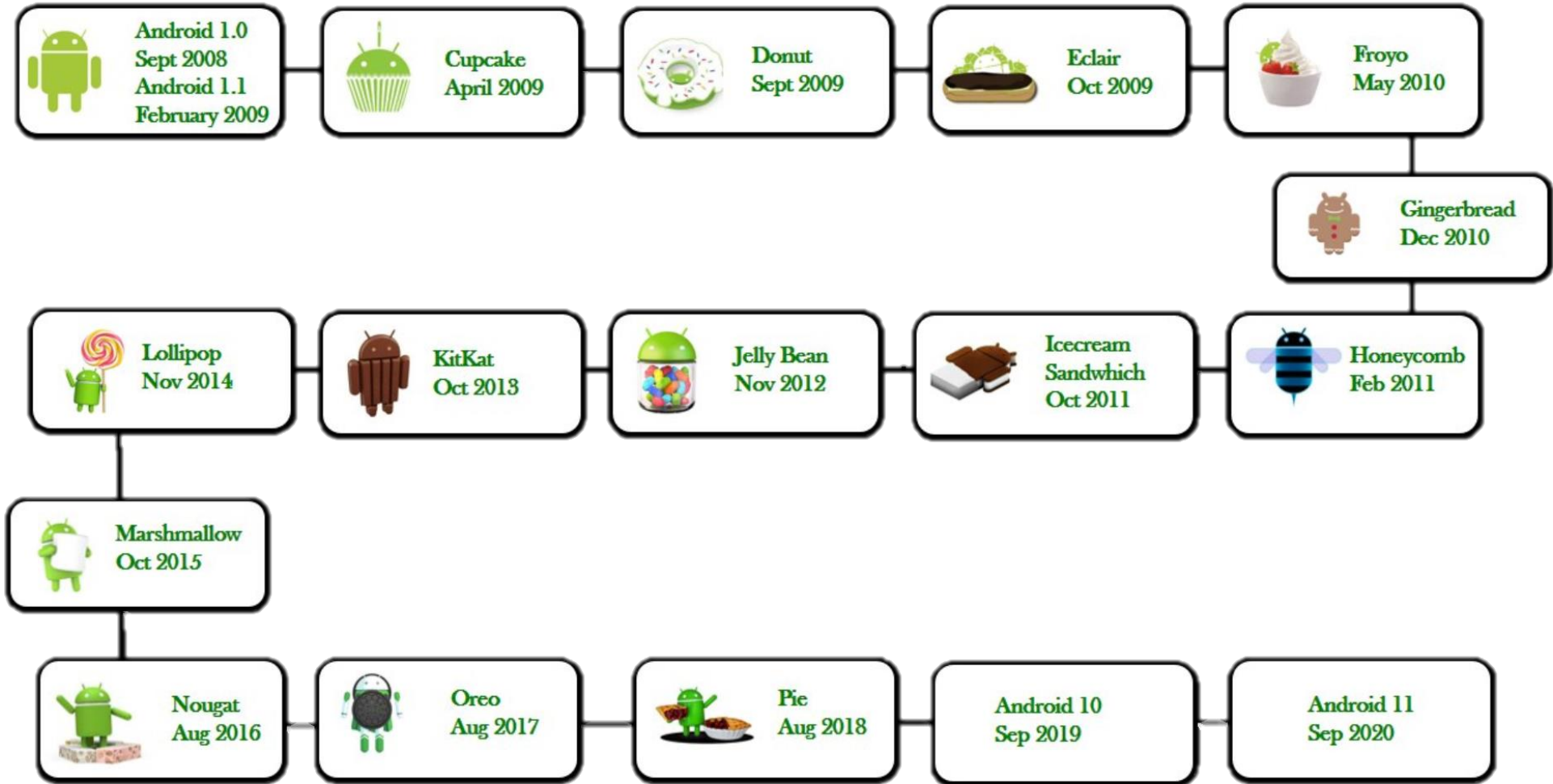
- **Architecture of Android**

- **Conclusion**

Introduction of Android

- It is a open source software platform and operating system for mobile devices.

- Based on the Linux Kernel

- Developed by Google and later the Open Handset Alliance (OHA).

- Allows writing managed code in the java language

- Android has its own virtual machine i.e. DVM(Dalvik Virtual Machine), which is used for executing the android application.

- Google purchased the initial developer of the software , android incorporated in 2005.

History Of Android

- Initially, **Andy Rubin** founded Android Incorporation in Palo Alto, California, United States in October, 2003.
- In 17th August 2005, Google acquired android Incorporation. Since then, it is in the subsidiary of Google Incorporation.
- The key employees of Android Incorporation are **Andy Rubin**, **Rich Miner**, **Chris White** and **Nick Sears**.
- Originally intended for camera but shifted to smart phones later because of low market for camera only.
- Android is the nick name of Andy Rubin given by coworkers because of his love to robots.
- In 2007, Google announces the development of android OS.
- In 2008, HTC launched the first android mobile.

Versions of Android

Android Cupcake 1.5

- Released on April 30, 2009.

- Added auto-rotation option.

- Copy and Paste feature added in the web browser.

- Increased speed and performance but not upto required level.

Cupcake

Android Donut 1.6

- Released on September 15, 2009.
- Voice Search and Search box were added.
- Faster OS boot times and fast web browsing experience.

Android Eclair 2.0/2.1

- Released on October 26, 2009.
- Bluetooth 2.1 support.
- Improved typing speed on virtual keyboard, with smarter dictionary.
- No Adobe flash media support.

Donut

Eclair

Android Froyo 2.2

- Released on May 20, 2010.
- Support for Adobe Flash 10.1
- Improved Application launcher with batter browser.
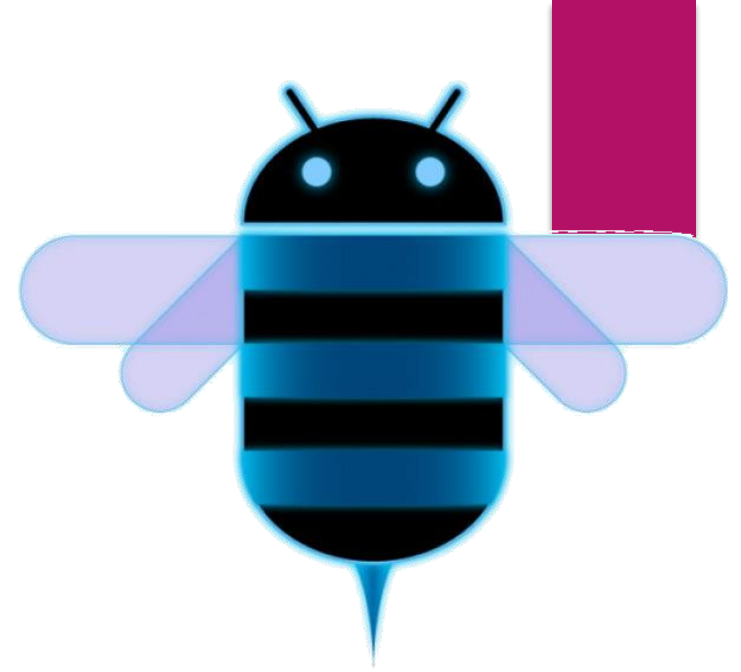- No internet calling.

Android Gingerbread 2.3

- Released on December 6, 2010.
- Updated User Interface with high efficiency and speed.
- Internet calling.
- One touch word selection and copy/paste.

Froyo

Gingerbread

Android Honeycomb 3.0

- Released on **February 22, 2011**.
- Support for multi-core processors
- Ability to encrypt all user data.
- This version of android is only available for tablets.

Android Ice Cream Sandwich 4.0

- Released on **November 14, 2011**.
- Virtual button in the UI.
- A new typeface family for the UI, Roboto.
- Ability to shut down apps that are using data in the background.

Honeycomb

Ice Cream Sandwich

Android Jelly Bean 4.2/4.3

- Released on **13 November 2012.**
- Lock screen improvements.
- Multiple user accounts (tablets only)
- Bug fixes and performance enhancements.
- Smoother user interface

Jelly Bean

Android KitKat 4.4

- Released on **31 October 2013**.
- Ability for applications to trigger translucency
- In the navigation and status bars

KitKat

Android Lollipop 5.0/5.1

- Released on **November 12, 2014.**
- features like redesigned user interface, support for 64-bit CPUs.
- Support for print previews, material design, Project Volta for battery life improvement, multiple user accounts.
- Device protection, high-definition voice calls, native Wi-Fi calling support.

Lollipop

Android Marshmallow 6.0/6.1

- Released on **October 5, 2015.**
- Doze mode to save battery life.
- native fingerprint reader support.
- run-time permission requests, USB-C support.

Marshmallow

Android Nougat 7.0/7

- Released on **August 22, 2016.**
- Split-screen Chrome
- Clear all apps in multitasking
- Third-party quick setting
- App install source
- Quick app switching
- Data saver

Android Nougat 8.0

- Released on **August 21, 2017.**
- Picture-in-picture, notification grouping.
- Performance improvements and battery usage optimization.

Nougat

Oreo

Pie

Android Q

Android Pie 9.0

- Released on **August 6, 2018.**
- Adaptive battery life
- Adaptive brightness
- App actions
- Navigation changes
- Volume slider and screen rotation fixed

Android 10.0

- Released on **September 3, 2019.**
- An improved file app, Wi-Fi sharing via QR code, Privacy and security, Platform.
- Live caption, Smart reply, Sound.

Android 11

Snow Cone

Android 11.0

- Released on **September 8, 2020.**
- App Suggestions
- Mute notifications while video recording.
- Priority conversations
- Unified Device controls and permissions
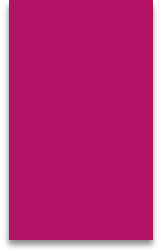
Android Snow Cone 12.0/12.1

- Released on **October 4, 2021.**
- Privacy.
- Quick Setting Improvements.
- Best Performance As Well As

Features Of Android

- **General:-**
  - **Messaging**
  - **Wab Browser**
  - **Voice-based features**
  - **multi-touch**
  - **Multitasking**
  - **Screen capture**
  - **TV recording**
  - **Video calling**
  - **Multiple language support**
  - **Accessibility**

- **Connectivity:-**

- Media:-
  - Streaming Media Support
  - Media Support
  - External Storage
- Hardware Support:-
  - Cameras
  - Touch Screens
  - GPS
  - Accelerometers
  - Gyroscopes
  - Barometers
  - Magnetometers
  - Dedicated Gaming Controls
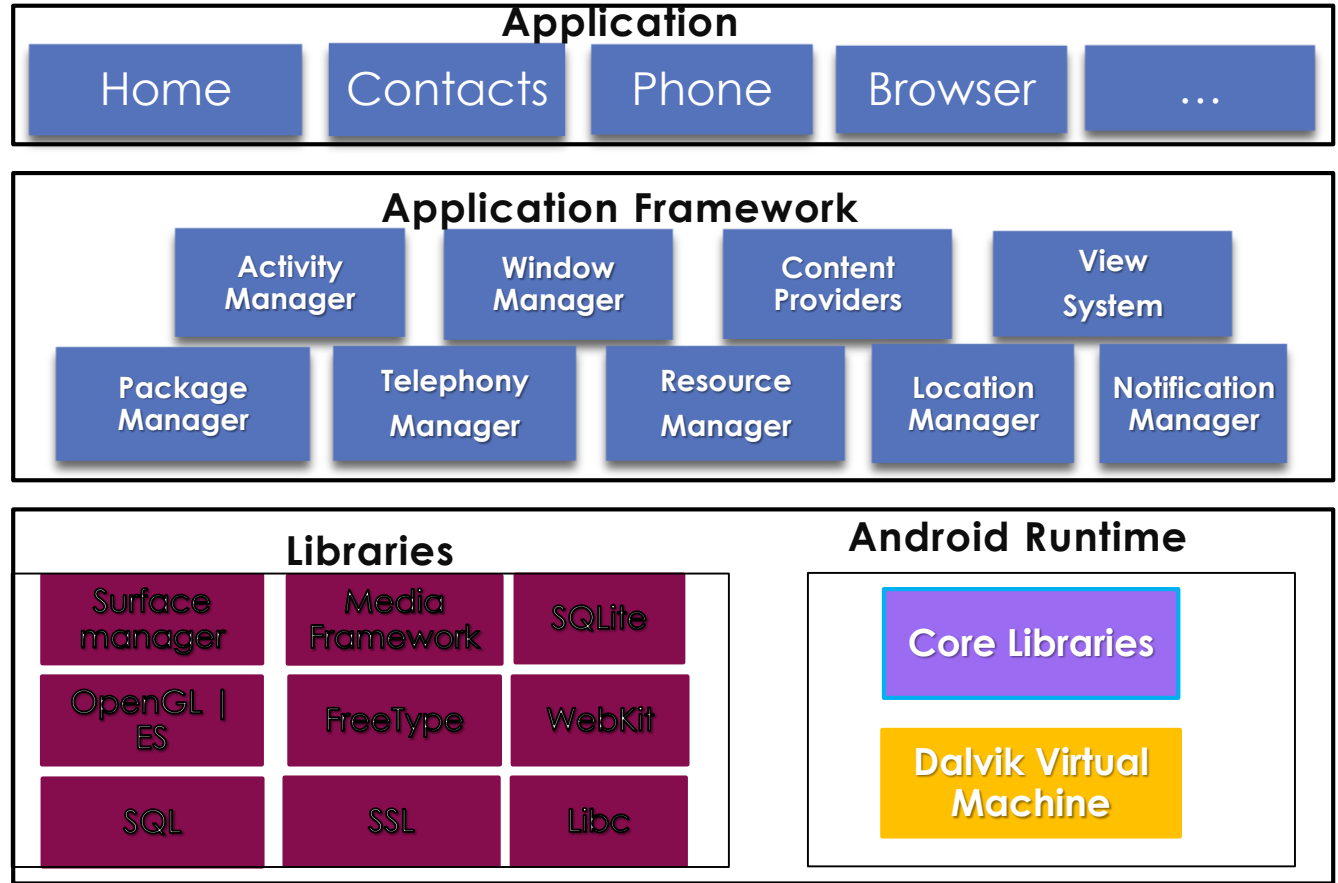 - Proximity
  - Pressure Sensors
  - Thermometers

Security

- Android is a multi-process system, in which each application (and parts of the system) runs in its own process.

- Most security between application and the system is enforced at the process level through standard Linux facilities, such as user and group IDs that are assigned to applications.

- Android is designed to having multi layer security which provides flexibility for this platform.

- When attackers attempt attack on device, android platform help to reduce the portability of the attack.

Android Architecture

- **Linux Kernel**

- **Android Runtime**

- **Libraries**

- **Application Framework**

- **Application**

Application

Home	Contacts	Phone	Browser	…

Application Framework

Activity Manager	Window Manager	Content Providers	View System

Package Manager	Telephony Manager	Resource Manager	Location Manager	Notification Manager

Libraries

Surface manager	Media Framework	SQLite
OpenGL	ES	FreeType	WebKit
SQL	SSL	Libc

Android Runtime

Core Libraries

Dalvik Virtual Machine

Conclusion

- I've learned through my research that Android is a much more diverse operating system than iOS and Windows Phone Mobile.

- Android has grown rapidly over the past 4 years becoming the most used smartphone operating system in the world.

- It's because Android doesn't release 1 phone from 1 company with 1 new OS every year, but countless phones from numerous companies, adding their own twist, throughout the year, developing gradually day-by-day.

- Android's ability to customize is unparalleled compared to Apple's and Microsoft's software allowing the user to change and customize nearly every wouldn't dream possible.

THANK YOU

PREPARED BY :-

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