Understanding of IoT and AndroidThings

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Agenda :

What is IoT?

Scope and its Advantages

Core Services

Understand Weave

Walkthrough with AndroidThings

Code basics

Demo

Terminals

Human Augmentation

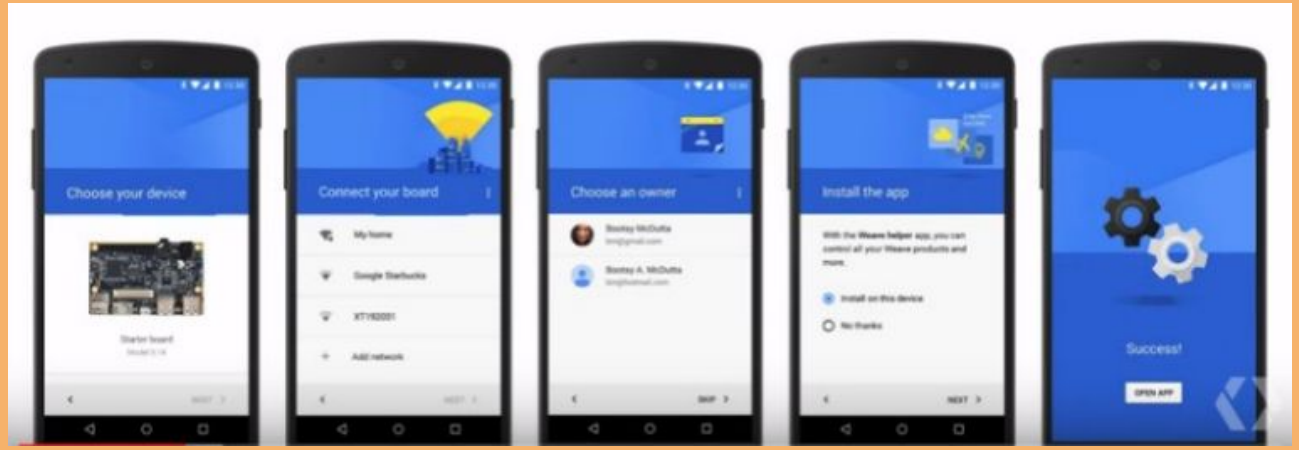
Robotics

Enchanted Objects

Scope and Advantage of IoT

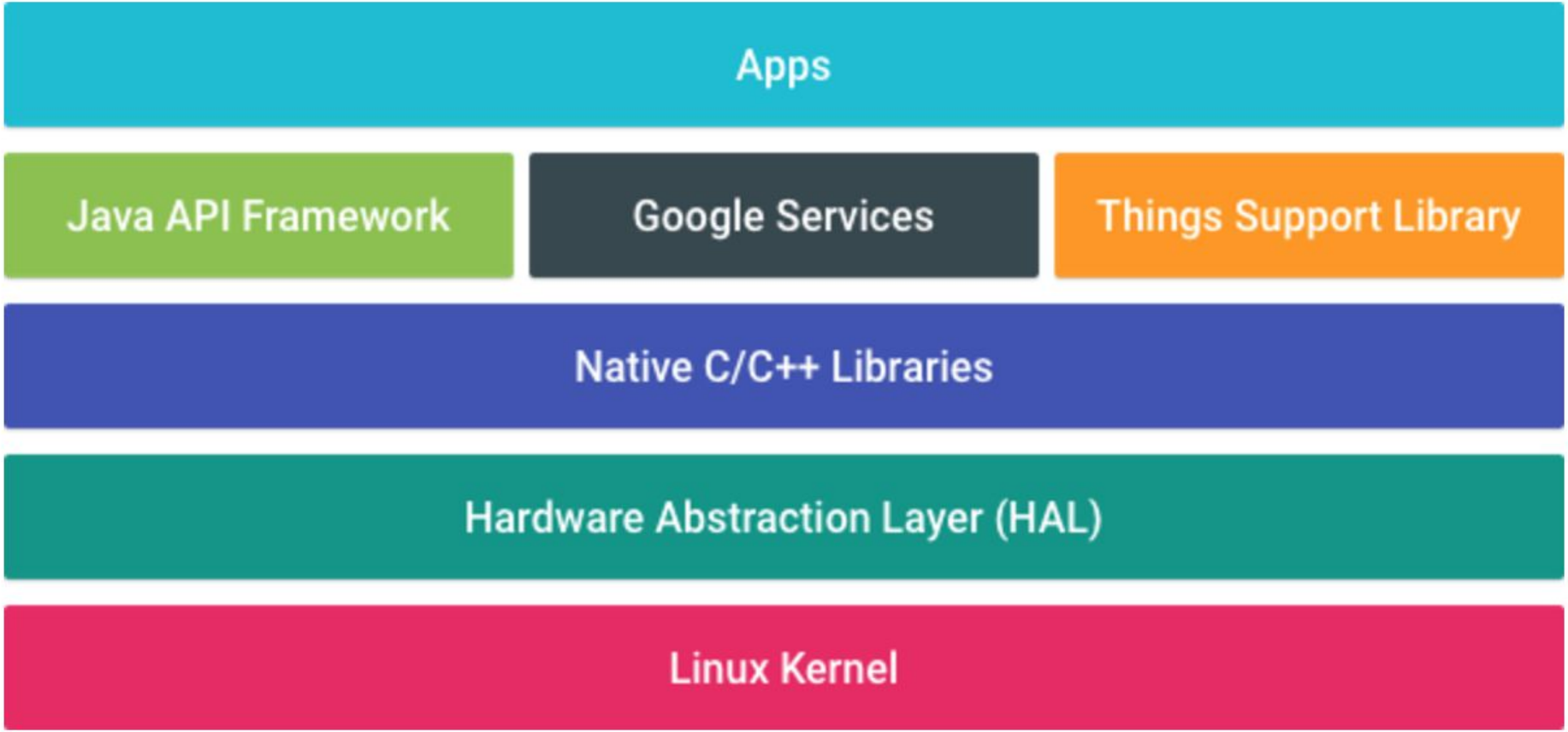
- Enhanced Product experience.

- Product virality.

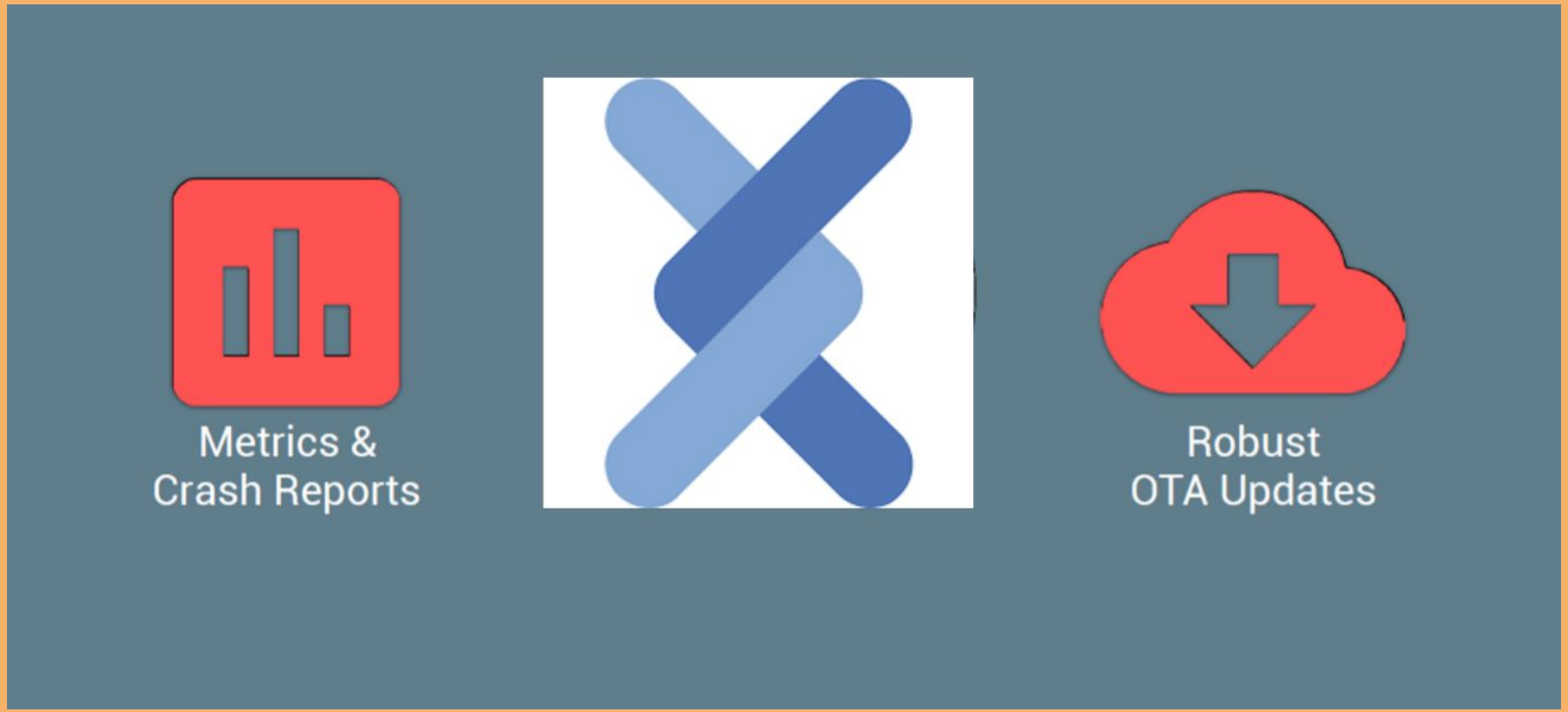


IoT based LED bulbs

AndroidThings

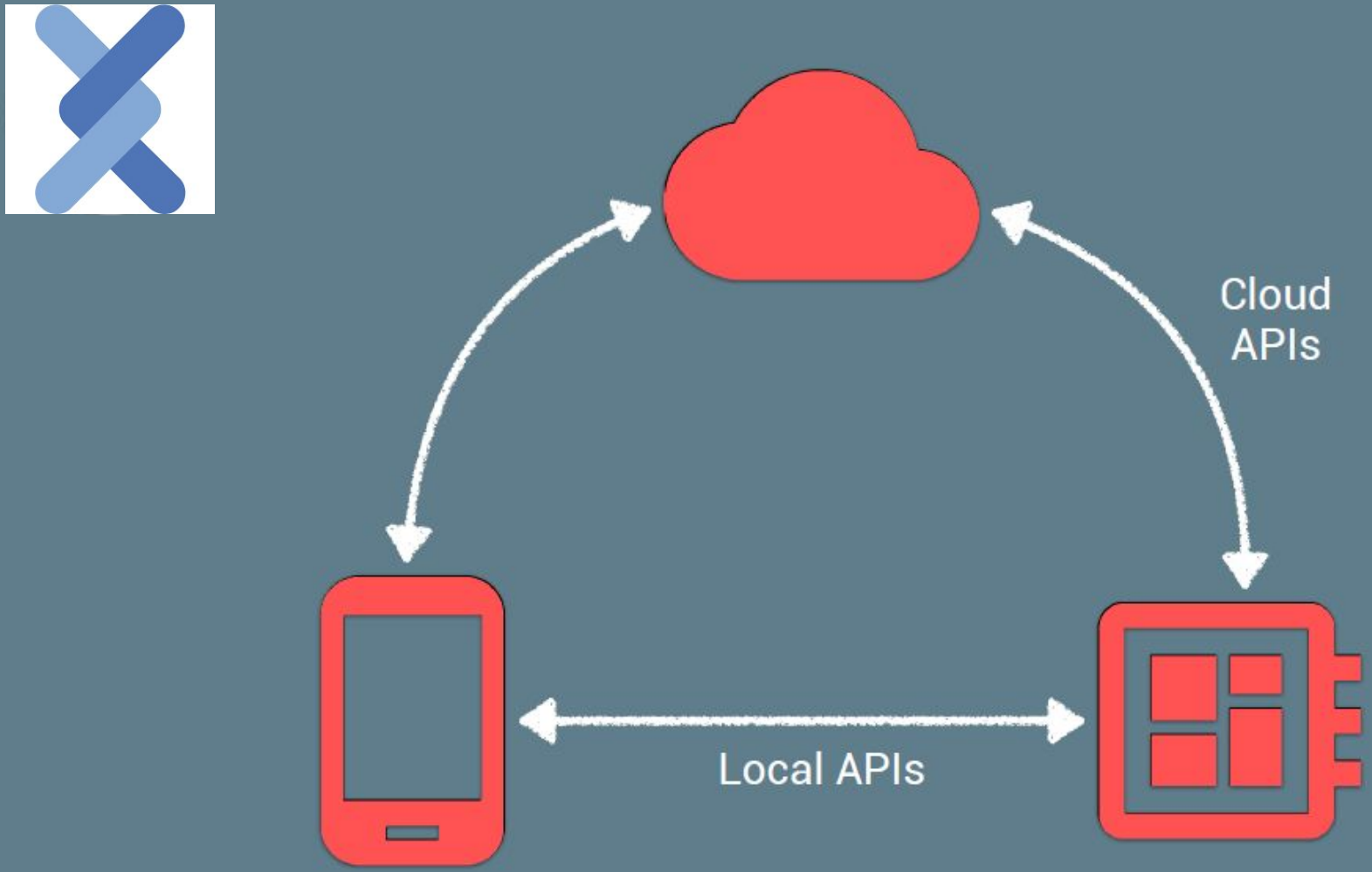


Core Services



Weave

- Enables the link between devices.
- Fast Communication via cloud and local network
- Common way of communication across devices.
- Common way of authorization, device discovery and interaction.


Cloud
APIs
Local APIs


Discovery
Provisioning
Setup


Send Device Commands
Update Device State
Sync Device State

Developer Tools :

- Weave Developer Console
    - Device Metrics
    - Test new prototypes
- CLI (Command Line Interface) for prototypes
    - Script based interaction with devices

Example of Weave sdk based app :

https://github.com/googlesamples/android-WeaveLedToggler

Demonstrates basic usage of the Weave API to toggle LEDs on a compatible device.

AndroidThings Boards

Platform	**Intel® Edison**	**Intel® Joule**	**NXP Pico i.MX6UL**	**Raspberry Pi 3**
	 Learn More Where to buy Get Started	 Learn More Where to buy Get Started	 Learn More Where to buy Get Started	 Learn More Where to buy Get Started
CPU & Memory	• Intel® Atom™ • 500MHz dual-core x86 • 1GB RAM	• Intel® Atom™ • 1.5GHz/1.7GHz quad-core x86 • 3GB/4GB RAM	• NXP i.MX6Ultralite • 500MHz ARM Cortex A7 • 512MB RAM	• Broadcom BCM2837 • 1.2GHz quad-core ARM Cortex A53 • 1GB RAM
Storage	4GB eMMC	8GB/16GB eMMC	4GB eMMC	MicroSD card slot
Display	No	HDMI	No	HDMI
Camera	No	CSI-2	No	CSI-2
Audio	USB 2.0	USB 2.0	3.5mm Analog	USB 2.0 3.5mm Analog Output

Code basics for AndroidThings app

- Displays are optional
- Activities are the primary components for your application
- No Default AndroidThings navigation buttons on screen
- It remains completely in your control to provide best user experience
- Framework delivers all input events to the foreground activity

Home Activity Support

- Expects apps to declare a home activity in its manifest file as the main entry point to start on launch
- Activity must contain intent filter with CATEGORY_DEFAULT and IOT_LAUNCHER
- Activity should also include CATEGORY_LAUNCHER intent filter, helping Android Studio to make this as the default activity to launch after deployment of app to the board

```
<application
    android:label="@string/app_name">
    <activity android:name=".HomeActivity">
        <!-- Launch activity as default from Android Studio -->
        <intent-filter>
            <action android:name="android.intent.action.MAIN"/>
            <category android:name="android.intent.category.LAUNCHER"/>
        </intent-filter>

        <!-- Launch activity automatically on boot -->
        <intent-filter>
            <action android:name="android.intent.action.MAIN"/>
            <category android:name="android.intent.category.IOT_LAUNCHER"/>
            <category android:name="android.intent.category.DEFAULT"/>
        </intent-filter>
    </activity>
</application>
```

Support for Google services :

Android Things support a subset of Google APIs for Android

Supported APIs	Unavailable APIs
Cast	AdMob
Drive	Android Pay
Firebase Analytics	Firebase App Indexing
Firebase Cloud Messaging (FCM)	Firebase Authentication
Firebase Crash Reporting	Firebase Dynamic Links
Firebase Realtime Database	Firebase Invites
Firebase Remote Config	Firebase Notifications
Firebase Storage	Maps
Fit	Play Games
Instance ID	Search
Location	Sign-In
Nearby	
Places	
Mobile Vision	

Permissions and Notifications

Requesting permission at runtime is not supported as embedded devices are not guaranteed to have a UI always

Declare both normal and dangerous permissions in your manifest file, it will be granted upon installation of the app

As there is no system wide status bar, notifications are not supported avoid calling NotificationManager APIs in your apps

What all things you need to start with your first AndroidThings App

- Raspberry Pi board
- AndroidThings image
- Micro sd card
- Card reader
- Jumper wires
- Resistor
- Breadboard
- Battery
- LED bulb
- AndroidStudio 2.2 with API 24 and above sdk support
- LCD monitor to connect to Raspberry pi

Demo finally :)

What we have learnt today?

- What is IOT and its scope
- AndroidThings - the IoT system for the changing world
- Developer tools
- How to start with AndroidThings
- Code basics
- LED blinking app Demo

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AndroidThings :
https://developer.android.com/things/index.html

Weave : https://developers.google.com/weave/

Thank You!

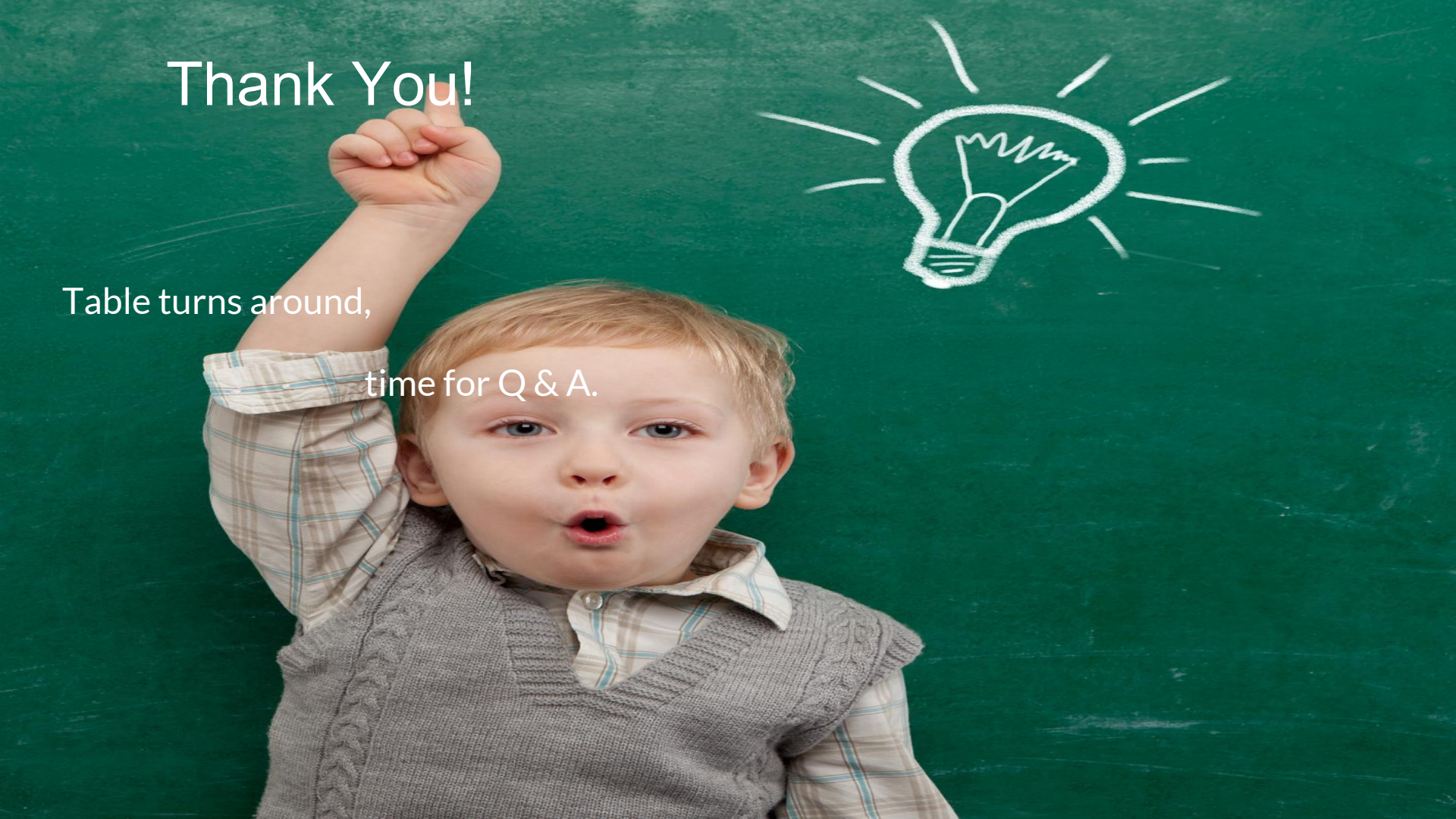

Table turns around,

time for Q & A.