ALLSEEN ALLIANCE

Connected Lighting Working Group

AllSeen Summit Update – Nov 2014

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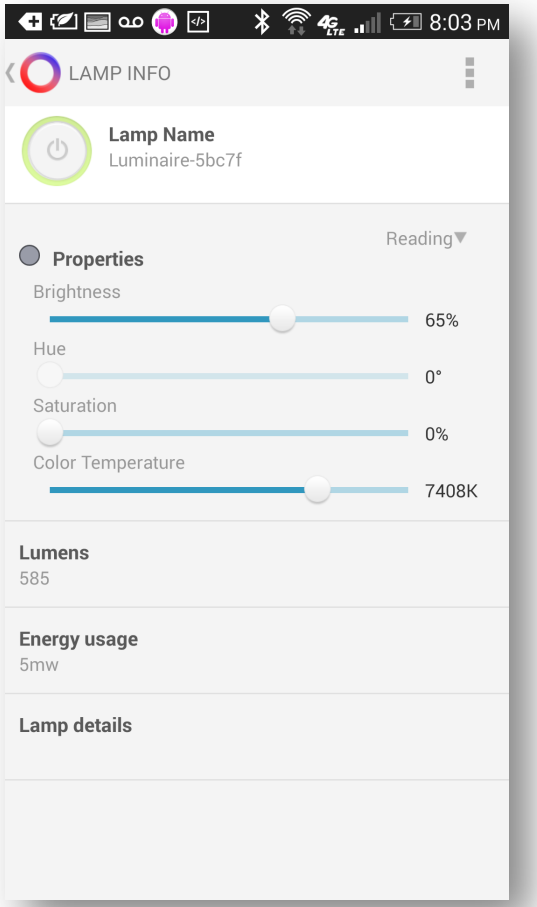
Working Group Overview

- Connected Lighting Working Group and Lighting Service Framework (LSF) Proposal submitted and approved April 1st, 2014
- Marc Alexander, CTO LIFX – Working Group Chair
- Active Contributors: Qualcomm Connected Experiences and LIFX
- Nov 14th the working group will release LSF 1.0, aka LSF 14.06
- 7.5 months from working group formation to first release of software
- Working Group Wiki: http://www.allseenalliance.org/connectedlighting
- To participate in the working group join the mailing list mailto:allseen-lighting@lists.allseenalliance.org

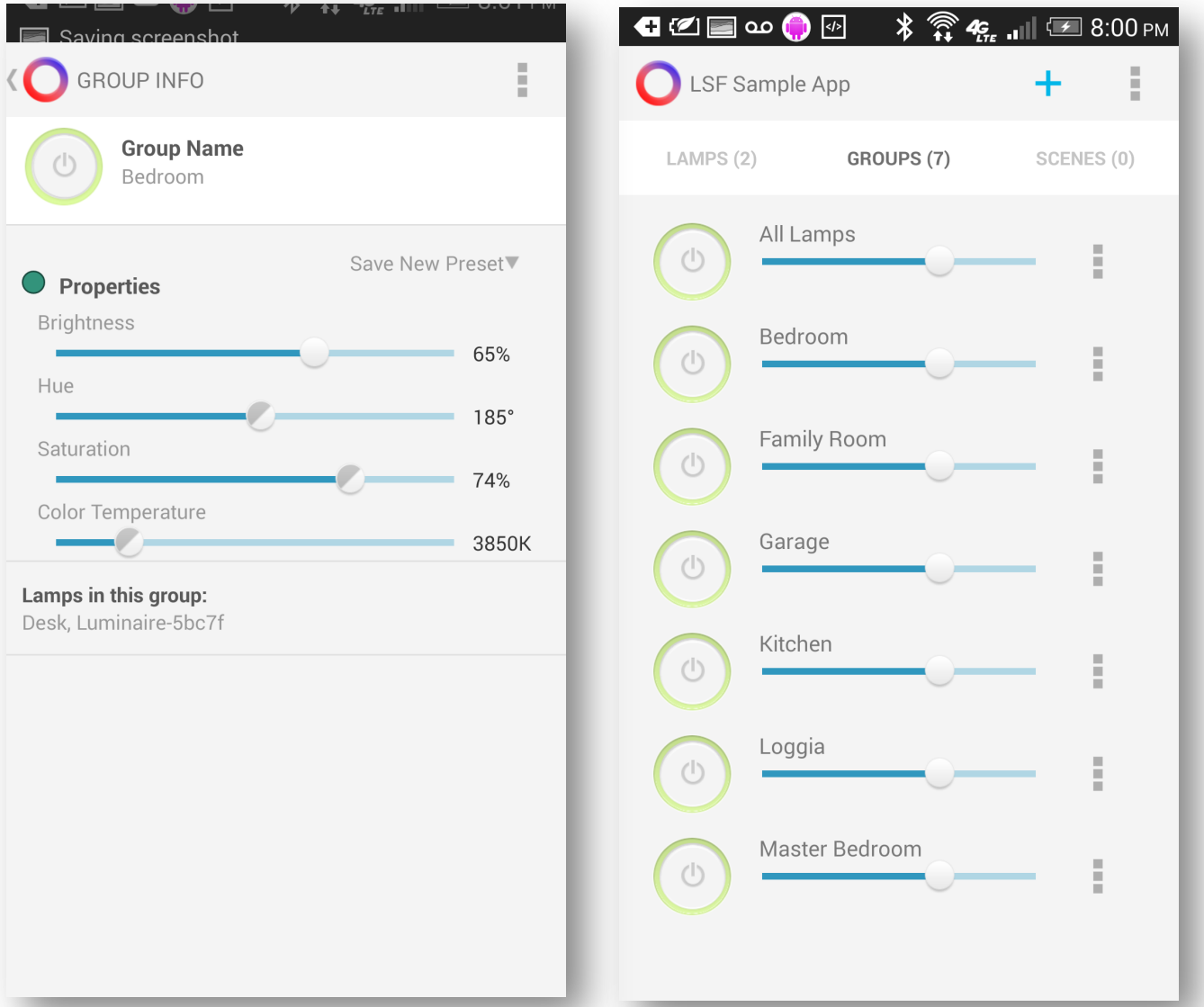
Lighting Service Framework (LSF)

- The Lighting Service Framework (LSF) provides an open and common way of communicating with AllJoyn-based connected lighting products, regardless of manufacturer.
- LSF makes connected lighting open and interoperable.
- This enables lighting manufacturers to make their products work with each other as well as other connected things.
- Provides 3rd party application developers with a common interface (API) to communicate with lights across manufacturers.
- Overview Presentation on YouTube Here.
- Source code: Here.



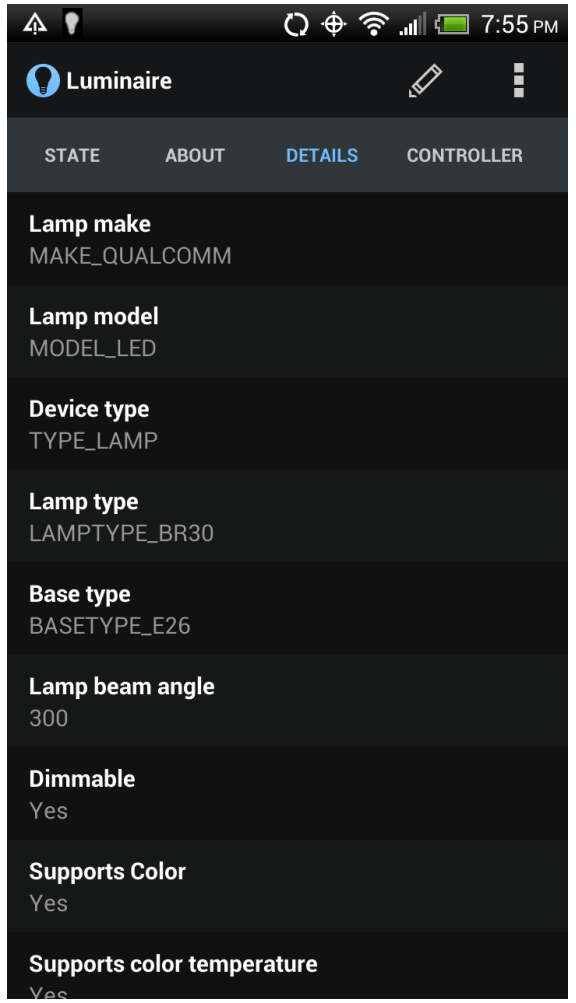
LSF Features

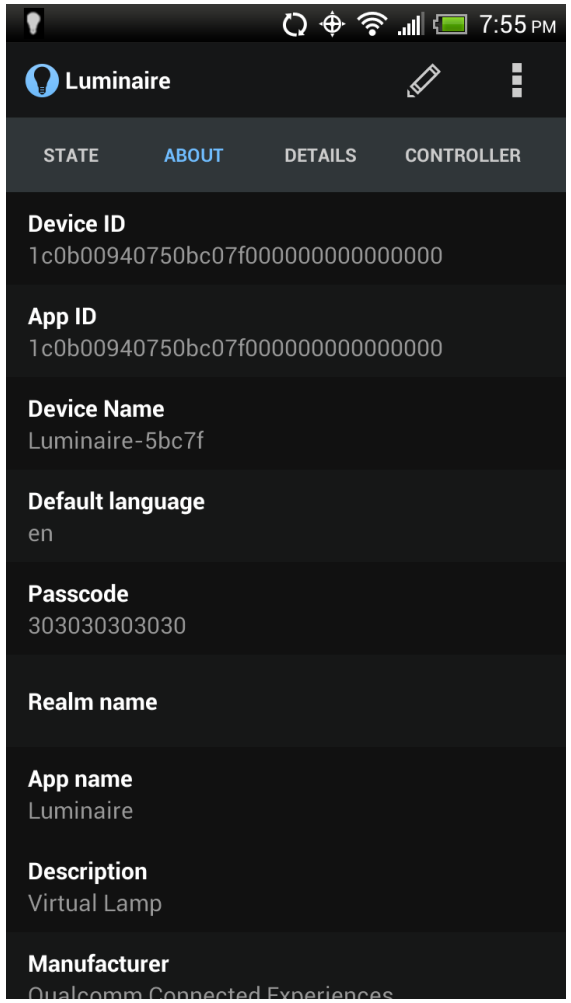
- Lamp Details
- Control
- Presets
- Groups
- Scenes
- Effects
- Events
- Actions



Lamp Details

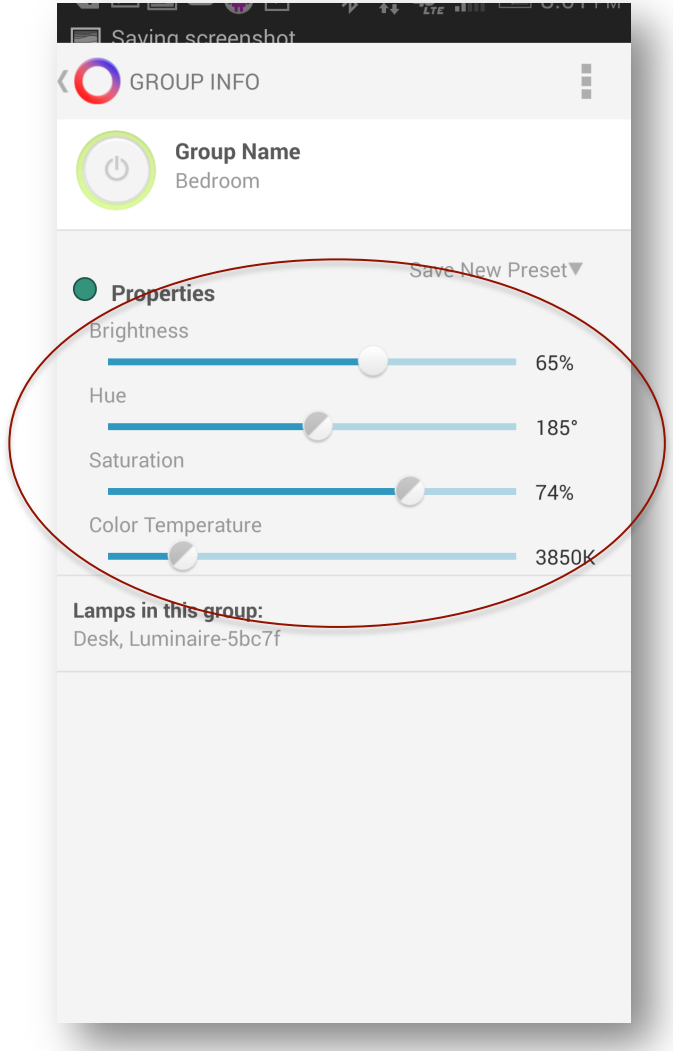
- Lamp Details are lamp-specific metadata that can be queried. Extends metadata in About.
- Make / Model
- Lamp / Base Type
- Dimmable Support
- Color Support
- Color Temperature Support
- Min/Max Voltage
- Wattage
- Max Lumens
- Min/Max Color Temperature





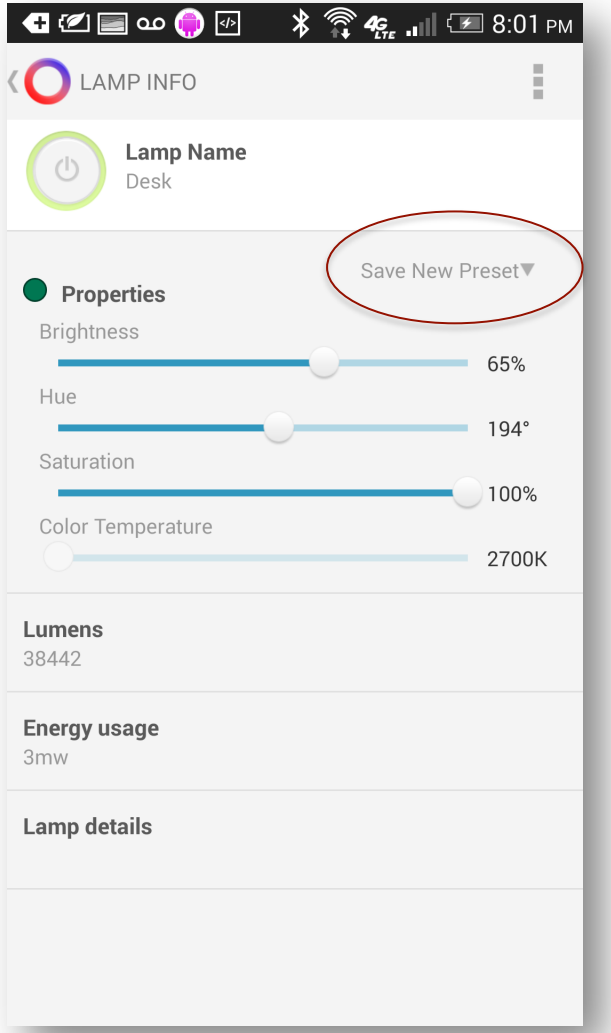
Control

- Power On/Standby
- Brightness
- Hue
- Saturation
- Color Temperature



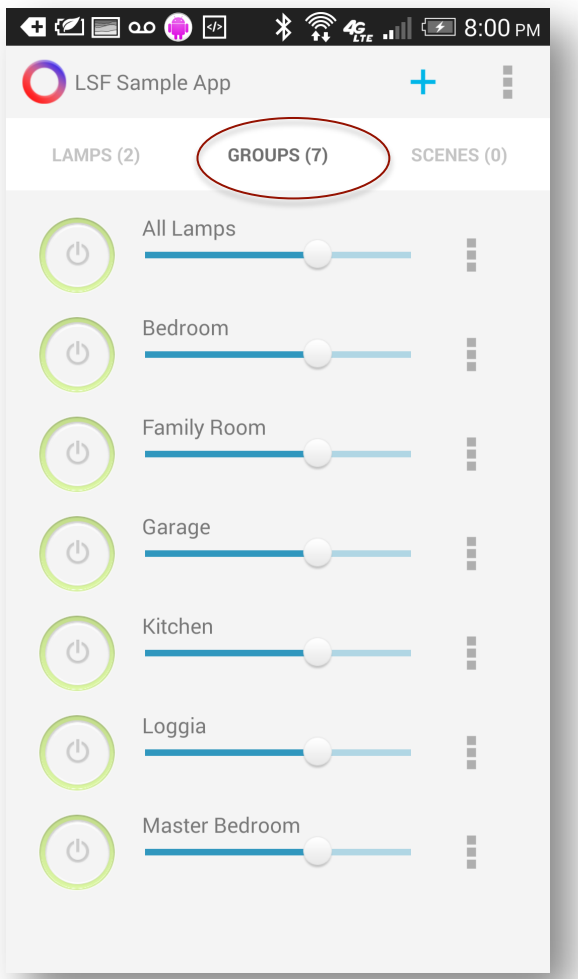
Presets

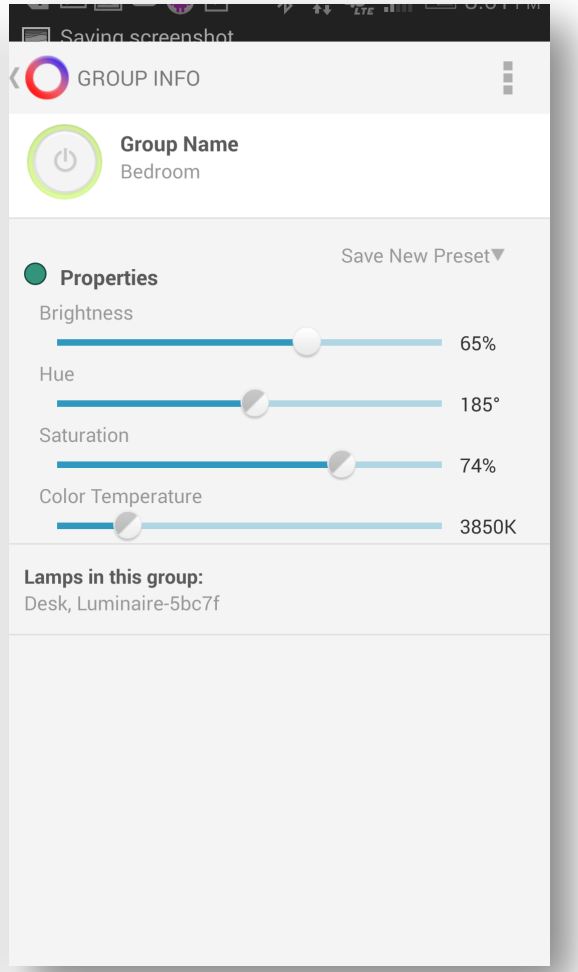
- Any combination of Hue, Saturation, Color Temperature, and Brightness properties can be saved as a “Preset”
- Presets can be named by the user
  - “Ocean Sunrise”
  - “Pink is so Pretty”
  - “Reading”
- Saved Presets can be applied to lamps or lamp groups and can be used in Scenes and Effects.



Groups

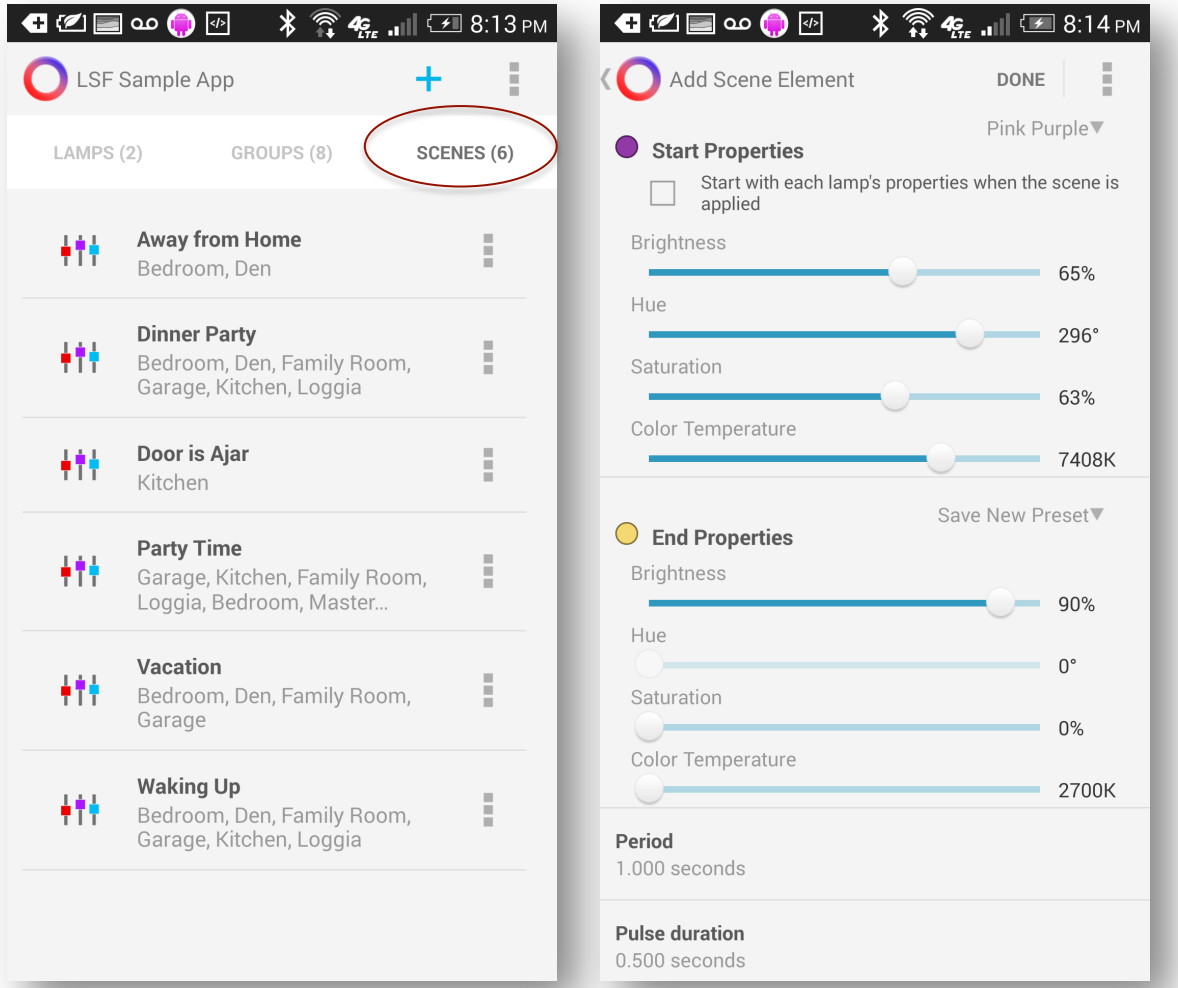
- Lamps can be grouped and controlled together
- Groups can contain individual Lamps or other groups.
- Lamps can be a member of more than one group.
- Example:
  - Home Group comprised of…
  - Bedroom, Family Room, Garage, Kitchen with Kitchen comprised of…
  - Kitchen Counter, Kitchen Cans, Kitchen Nook.





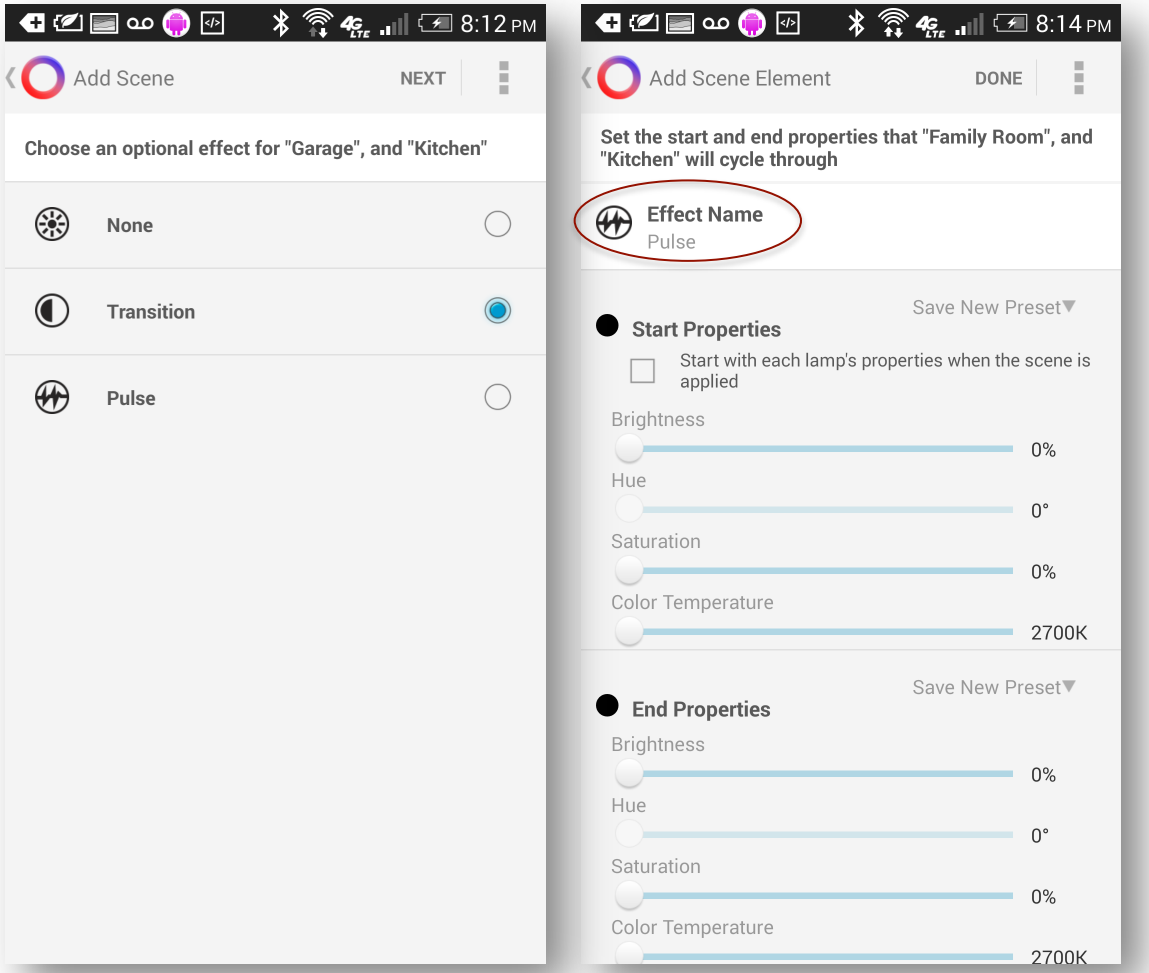
Scenes

- Scenes are preferences that can be saved to set a particular mood or automate a lighting configuration.
- Can be grouped in to Master Scenes
- Can contain lamps or lamp groups
- Can contain an effect
- Example “Dining” Master Scene comprised of:
  - Wall sconce group transitions to blue hue, 30% brightness
  - Art light group transitions to warm color temp, 40% brightness
  - Chandelier group transitions to cool color temp, 15% brightness.



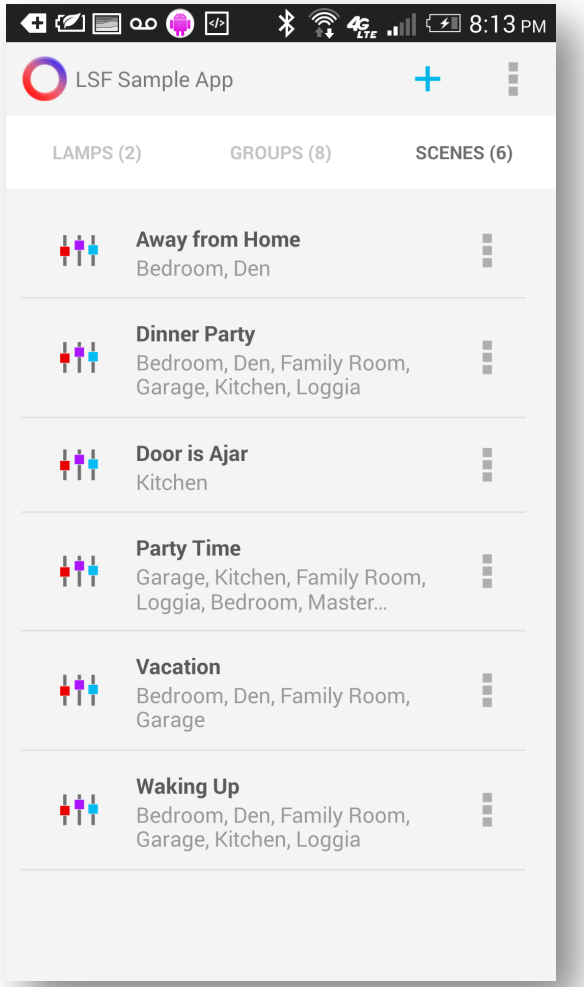
Effects

- 2 Effects are defined in the LSF, Transition and Pulse.
- Effects must be implemented in the lamp OEM firmware.
- Transition effect progresses to a preset or a manually defined lamp state over a duration of time.
  - “Transition to Pink is so Pretty over 30 seconds”.
- Pulse effect alternates from one preset or manually defined lamp state to another with a user defined period of time, duration for pulse, and number of pulses.
  - Pulse from “Pink is so Pretty” to “Ocean Sunrise” 20 times with a period of 1 second and a pulse duration of 500ms.



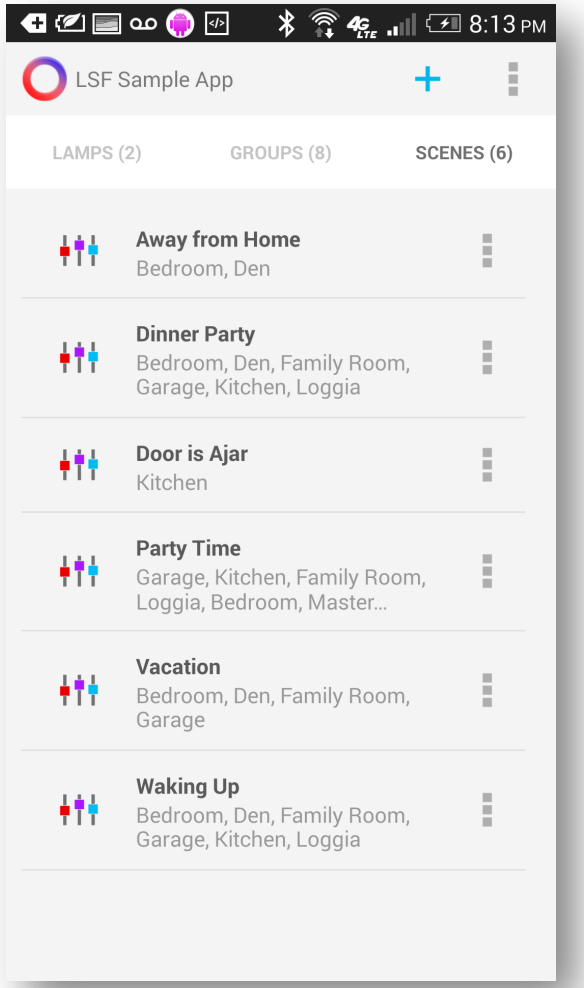
Events

- All Scenes created in the LSF generate AllJoyn Events when the Scene is applied.
- Events allow the LSF to notify other devices and applications when a Scene is applied, allowing them to react when they receive the Event.
- The Event is discoverable with a text descriptor that includes the Scene name.
- Create a new Scene and that Scene is instantly discoverable as an Event and will emit an Event (AllJoyn Signal) when the Scene is applied.
- Applications and other devices can listen for these events and take action. For example, when the “going to sleep” scene is applied, lock the doors.



Actions

- Actions allow Scenes in the LSF to be discovered, introspected, and easily invoked by other devices and applications.
- This makes it very easy for other devices to trigger a scene.
- The Action is discoverable with a text descriptor that includes the Scene name.
- Create a new Scene and that Scene is instantly discoverable and can be triggered by other devices simply invoking the Action.
- For example, the alarm system can invoke the “Red Alert” Action triggering a scene that flashes the lights in the house red.

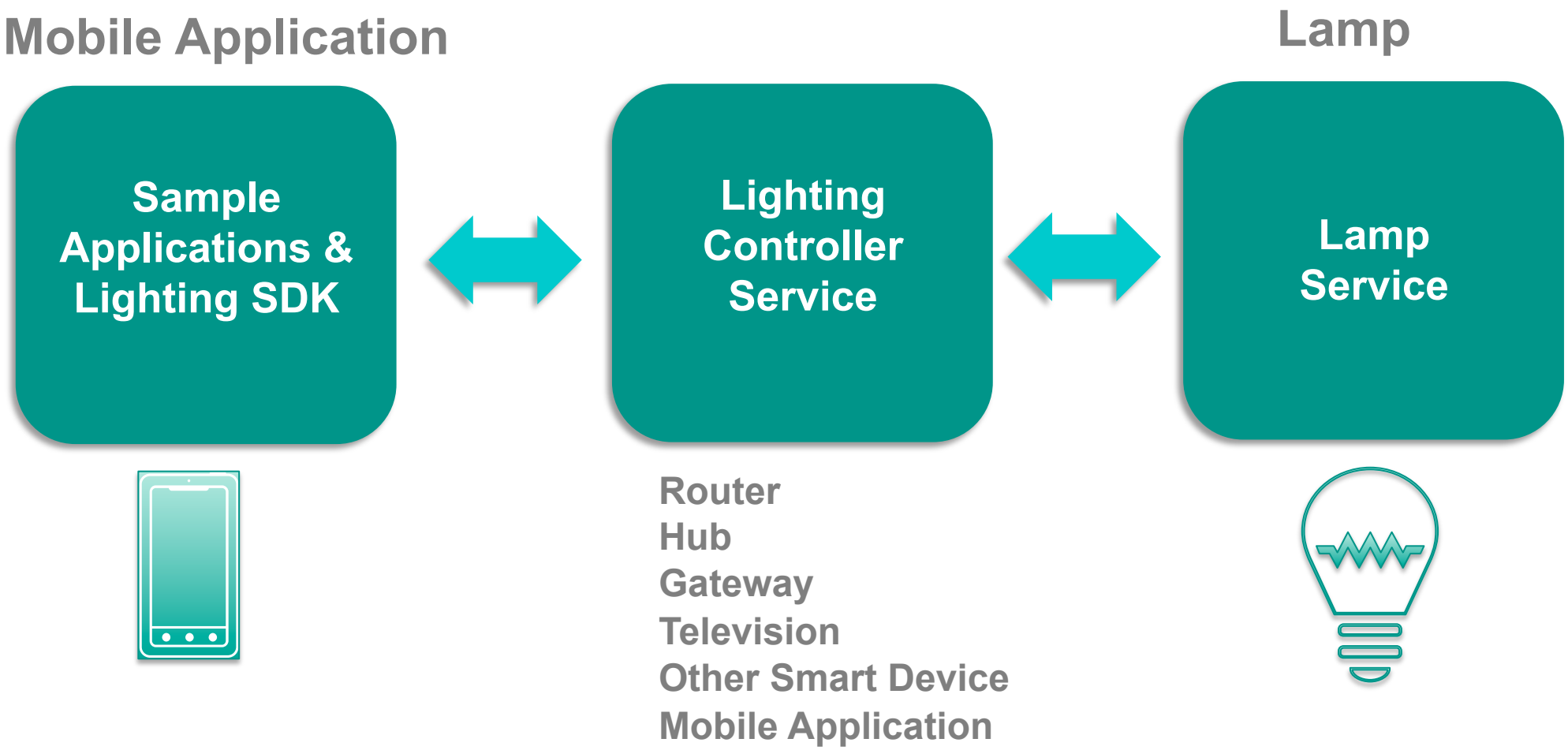


LSF Architecture

LSF is a multi-tier architecture with components that reside inside and outside of the lamp

1. Lamp Service
2. Lighting Controller Service
3. Sample Applications for Android and iOS
4. Lighting SDK for Android

LSF Architecture Cont…



1. Lamp Service

- The Lamp Service is implemented by the Lamp Manufacturer inside the Manufacturer firmware to make the lamp LSF compatible.
- Designed to run in a very small footprint (<1KB SRAM, 5KB Flash*) on an embedded RTOS in the lamps microcontroller.
- Works in conjunction with and is dependent on the AllJoyn Thin Core Library
- Exposes Lamp About information to broadcast Lamps presence on the network in addition to Lamp Details.
- Exposes AllJoyn methods and properties to get and set lamp state
- Leverages the Notification Service to announce problems with the Lamp.

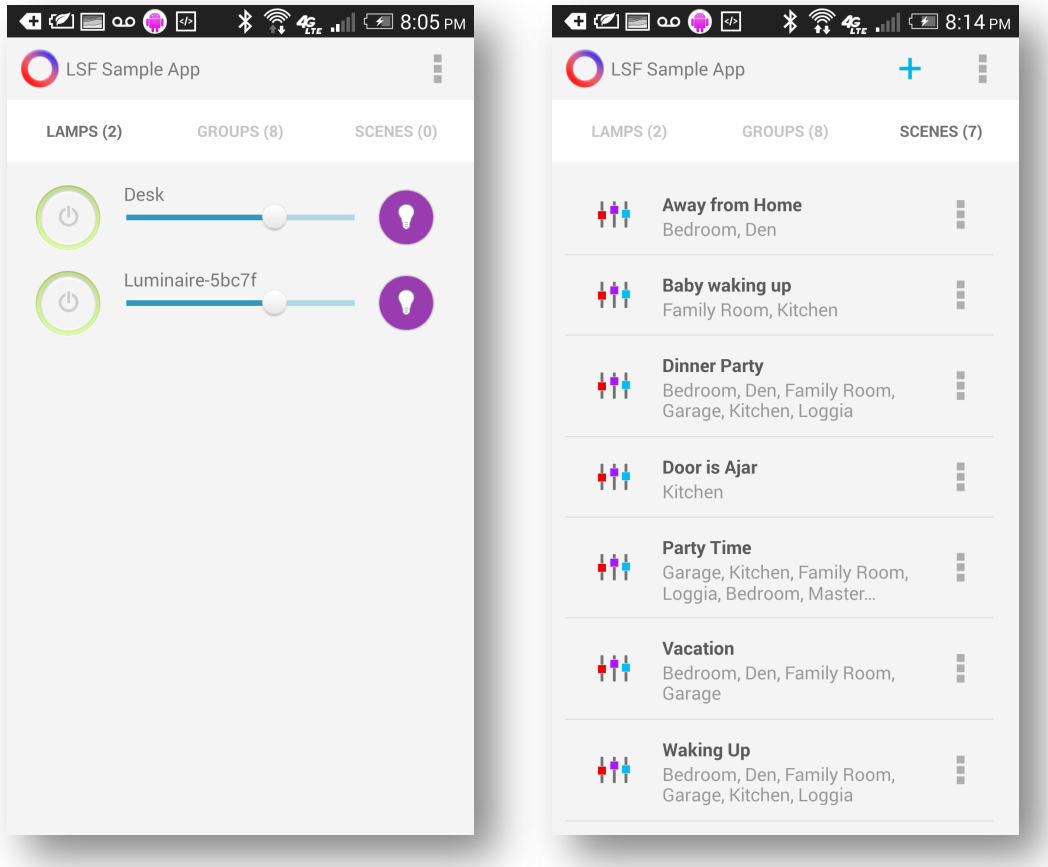
* Does not include AllJOyn Thin Core Library

2. Lighting Controller Service

- The Lighting Controller Service is a mandatory part of the Lighting Service Framework.
- Stores preset, group, and scene information
- Discovers and connects with devices running Lamp Service on the network allowing them to be controlled via the Sample Applications or Lighting SDK.
- Exposes Scenes as both Events and Actions
- Can run on router, gateway, hub external to the lamps, or be bundled in with the mobile app controlling the lamps.
- If multiple Lighting Controller Services are on the same network, they arbitrate and one becomes a leader (election algorithm) and the rest become Followers. Preset, Group, and Scene information is synchronized across controllers.

3. Sample Applications

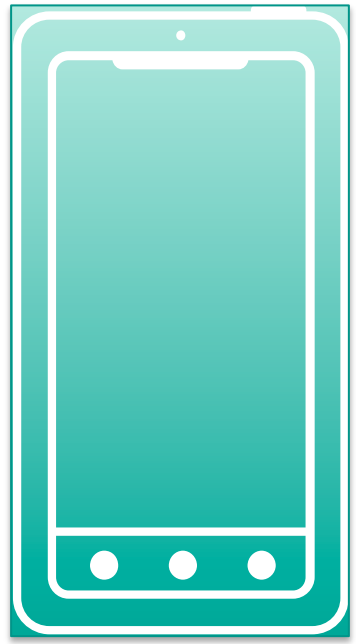
- Sample Applications are turnkey apps for iOS and Android that can be used by Lamp Manufacturers to jumpstart the development of their own branded LSF-compatible mobile apps.
- Sample apps provide a full implementation including lamp discovery, controlling lamp preferences, creating and managing presets, groups, and scenes and adding effects.
- Full source available for both applications, binary download for Android also available on the working group wiki here.



Sample App for Android

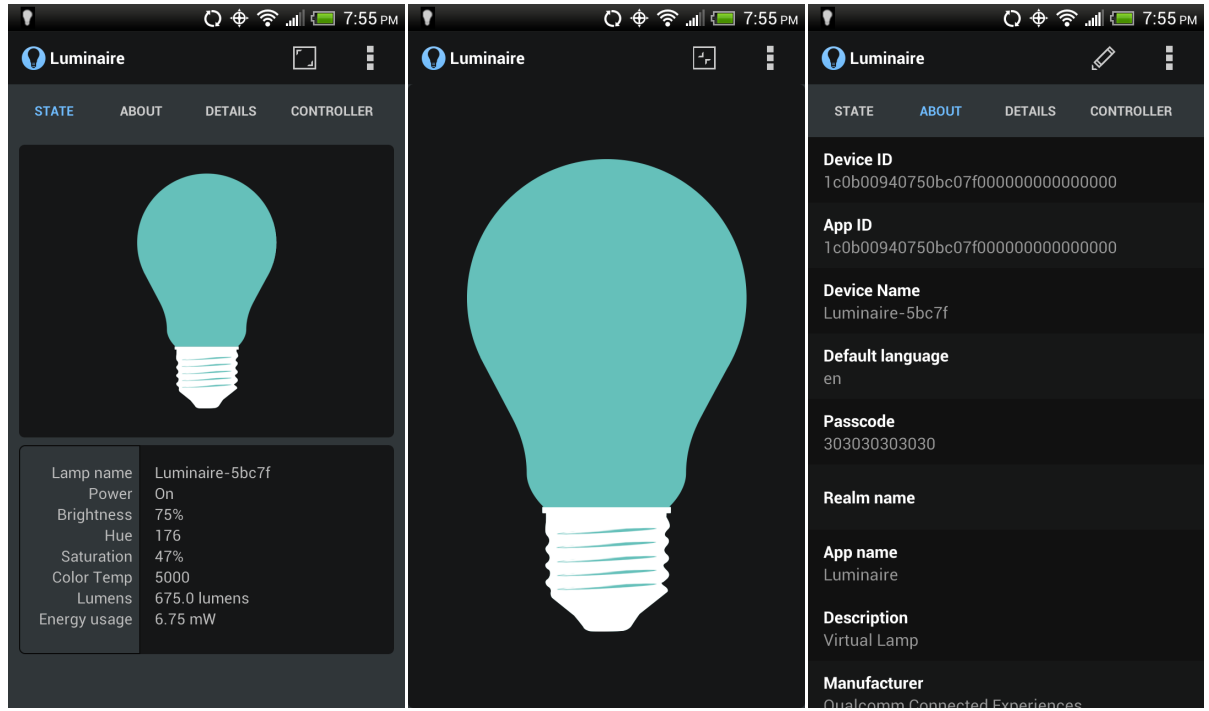
4. Lighting SDK (beta)

- The Lighting SDK provides Application Developers with a high level toolset for discovering and manipulating LSF-compatible lamps.
- The Lighting SDK will enable an apps ecosystem to develop, providing 3rd party application developers with a common API to build applications that control lights from different manufacturers.
- Discover individual or groups of lamps (via the Lighting Controller), manipulate their Hue, Saturation, Color Temperature, and Brightness.
- Discover and apply Scenes.
- Does not presently support creating groups, scenes, or presets.
- Lighting SDK is available for Android today. More on the SDK here.



Luminaire – Lamp Simulator developed by Qualcomm

- Luminaire is a LSF-compliant lamp simulator application for Android developed by Qualcomm Connected Experiences
- Not open source
- Available as a free download in Google Play
- Behaves just like a physical lamp
- Run Luminaire on multiple Android devices to simulate more lamps.
- View and modify lamp metadata
- Enable/disable lighting controller



GET IT ON Google play

Getting Started – Simple Demonstration

1. Watch the Overview Presentation on LSF on YouTube Here.
2. Download and install the Sample Application for Android on device #1 Here.
3. Download and install Luminaire from Google Play on device #2 Here.
4. Make sure both devices are on the same Wi-Fi.
5. Launch Luminaire on Device #2 and enable the Lighting Controller (Controller Tab)
6. Launch the Sample Application on Device #1 and you should see the virtual lamp Luminaire.
7. Modify it's Hue, Saturation, Color Temperature. Create Groups, Scenes, Presets, etc.

Roadmap

- Features are being considered for a release in Q1 2015
- Support for AllJoyn Core 14.12
- Lighting SDK support for iOS
- Lighting SDK support for bundled Lighting Controller
- Lighting SDK support for creating presets, groups, scenes
- Sample Applications for Android and iOS built on top of Lighting SDK

Thank you

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