

# Update on UPnP+, Cloud, Multi-Screen and IoT



March 2014

# Outline

- UPnP+
  - Overview/Status
- UPnP Cloud Annex (UCA)
  - Overview/Status
  - UCA Q&A
  - Cloud Demo Preview
- UPnP Multi-Screen DCP
  - Overview/Status
  - Multi-Screen Q&A
- IoT
  - Overview

# UPnP+

## UPnP Forum



# UPnP+: Overview

UPnP+ is a new certification program in UPnP. The external branding is TBD.

It will enhance the levels of interoperability, security, and common features.

It consists of three sets of minimum features at the

- Device & Control Point Architecture level
- Device Service level
- Specific Device Type level

# UPnP+: Architecture & Service

UPnP+ requirements at Device and Control Point Architecture level:

- Must support UDA1.2, IPv6, and Cloud.

UPnP+ requirements at the Device and Control Point Service level:

- Must support DeviceProtection, EnergyManagement, FriendlyInfoUpdate and BasicManagement services.
- Some additional QoS and Device Management requirements are under consideration.

# UPnP+: Device Specific

IGD=IGD2

AV=AV:4

- MediaServer:4 (required)
  - CONTAINER\_SHORTCUTS,
  - MULTI\_STREAM,
  - Search(),
  - Relaxed TCO.
- MediaRenderer:3 (required)
  - Pause(),
  - SetStreamingPlaylist(), SetStaticPlaylist(), GetPlaylist(),
  - GetRenderItemInfo,
  - GetAllowedTransforms(), GetAllAvailableTransforms, GetTransforms(), and SetTransforms

# UPnP+ Timeline

- Vast majority of test suite is complete and ready to go!
- Awaiting outcome of
  - IPv6 conversations with DLNA
  - finalization of Cloud test tooling
- Expected availability – 2Q 2014.

# UPnP Cloud

UPnP Forum

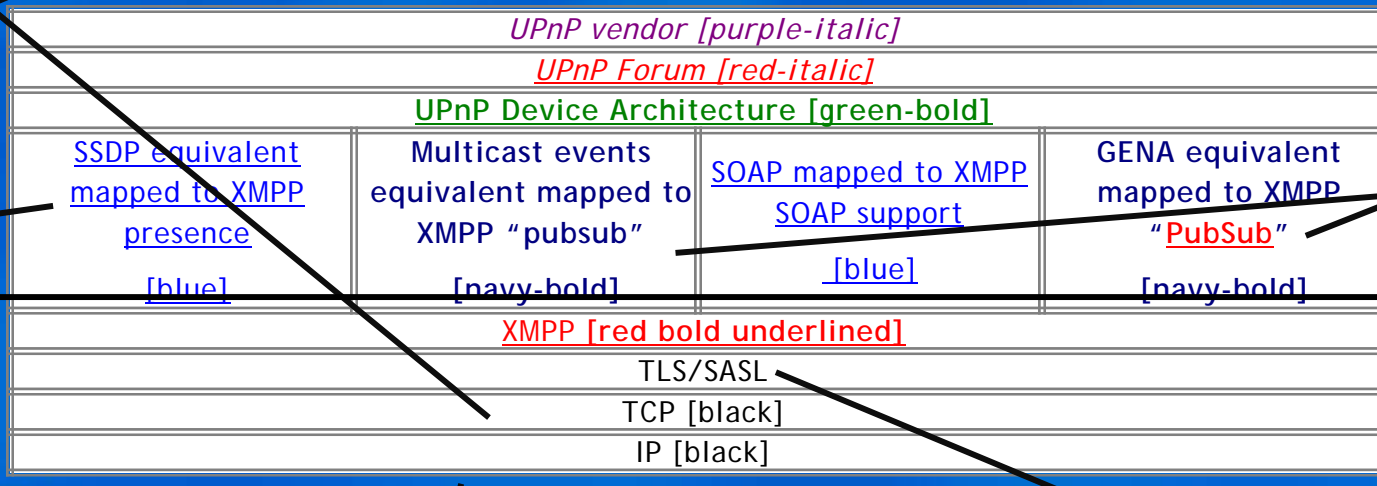
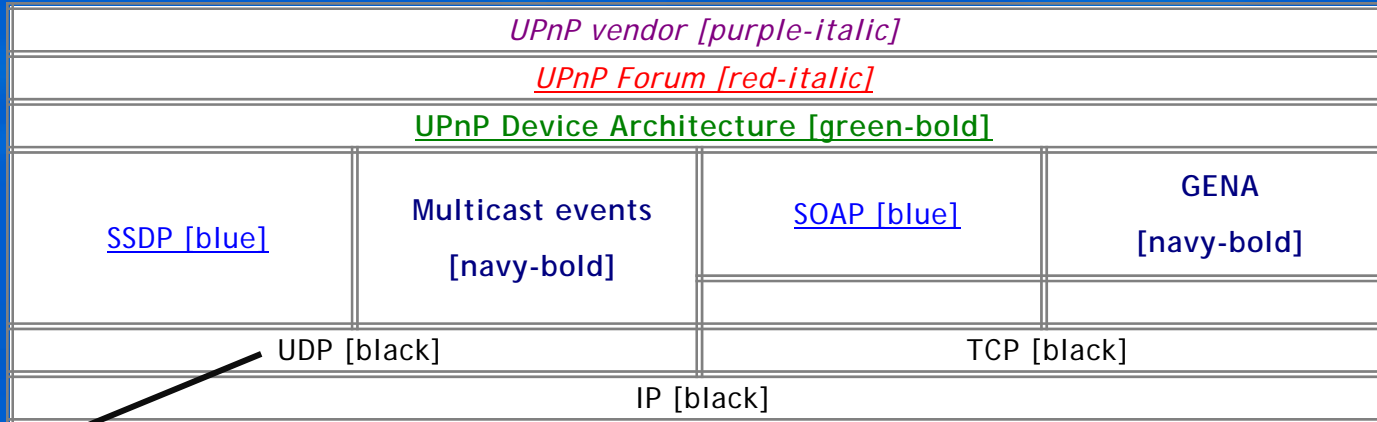




# UPnP Cloud: Overview

- UPnP Cloud is an Annex to the UPnP UDA much like IPv6. It is referred to as UDA Cloud Annex or UCA.
- UCA defines a profile of XMPP that can be added as a “wrapper” to a UPnP device or control point, making them a UPnP Cloud Capable Device (UCCD) or Control Point (UCC-CP) respectively. It allows them to connect to other devices and control points via an XMPP server (UPnP Cloud Server or UCS).
- In essence, this allows all DCPs to be leveraged to the Cloud.

# UDA vs UCA Protocol Stack



Unicast

Presence

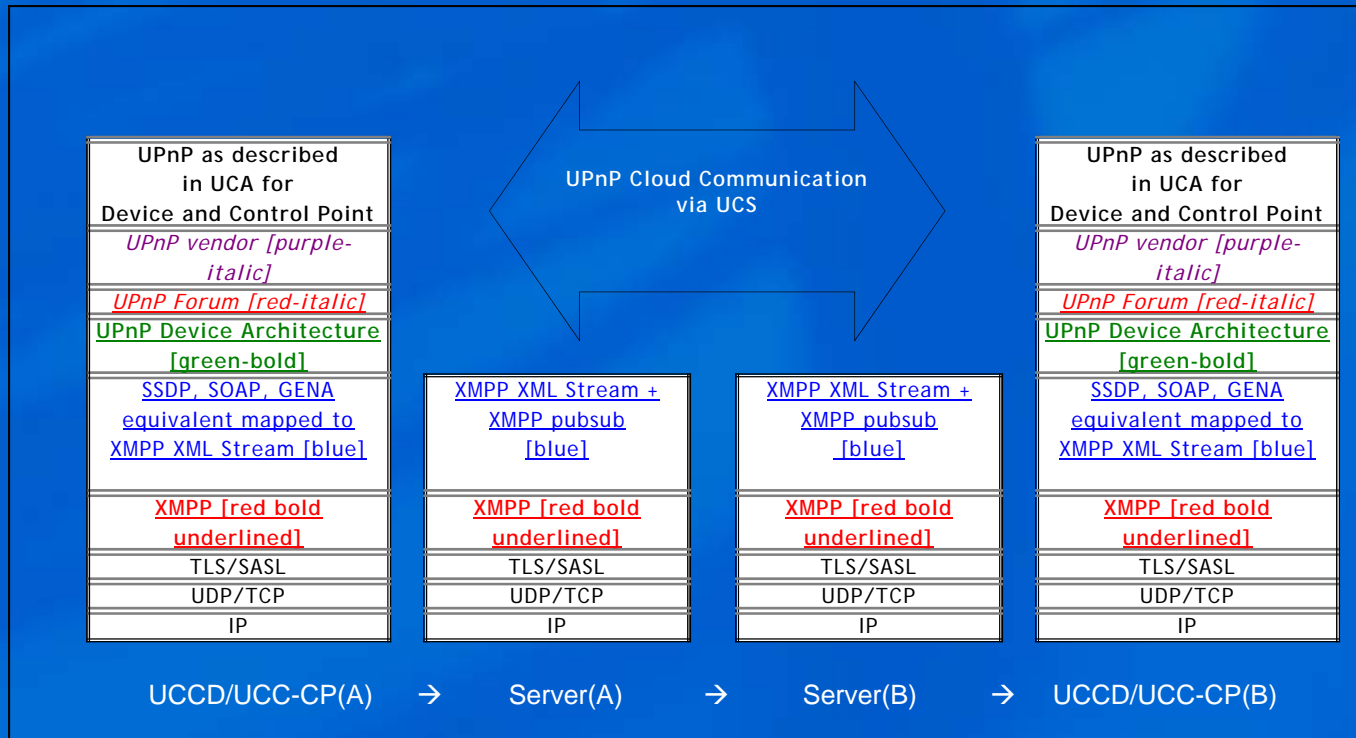
Scale

Proxy

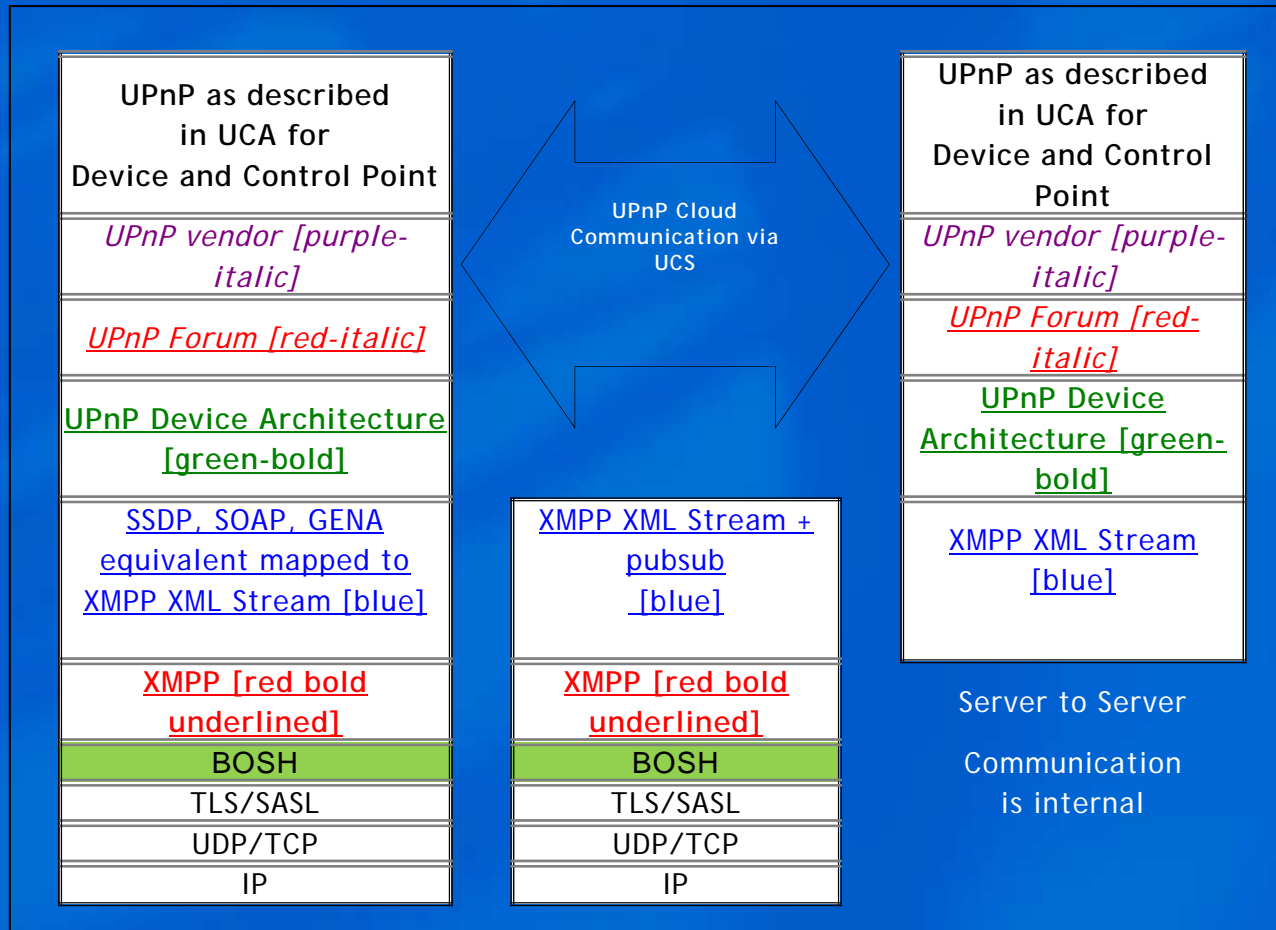
Secure



# UCA – UCCD/UCC-CP/UCS



# Web and Virtual Realizations



UCCD  
UCC-CP

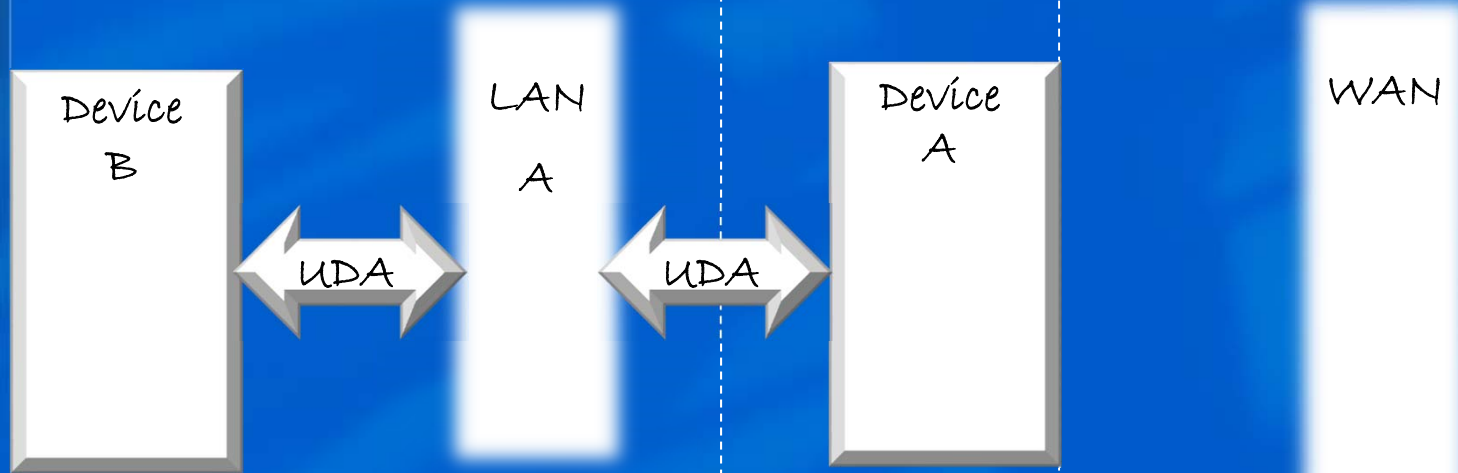


Server  
(UCS)



UCOD  
(UCCD in Cloud)

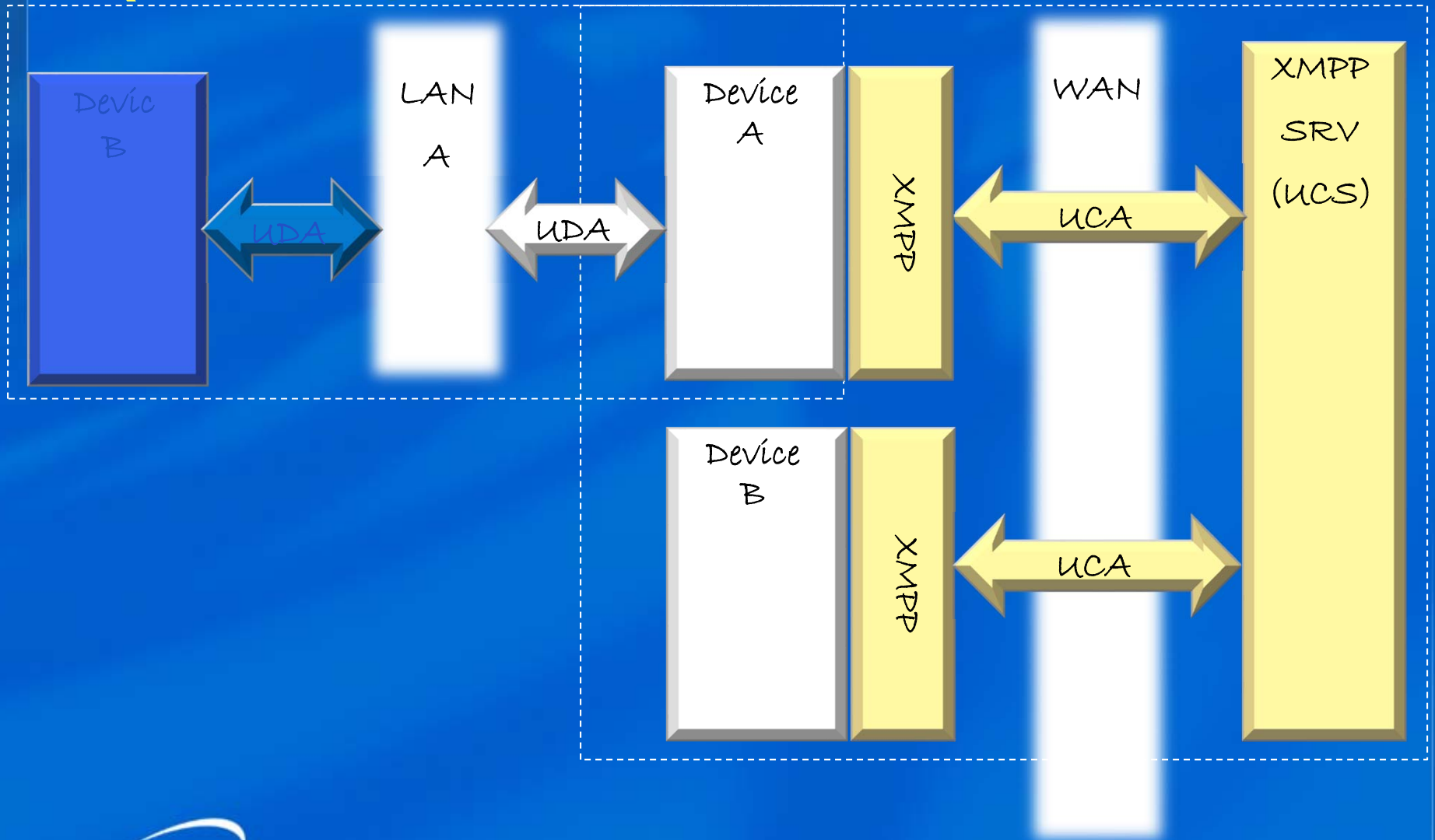
# UDA (+ UCA)



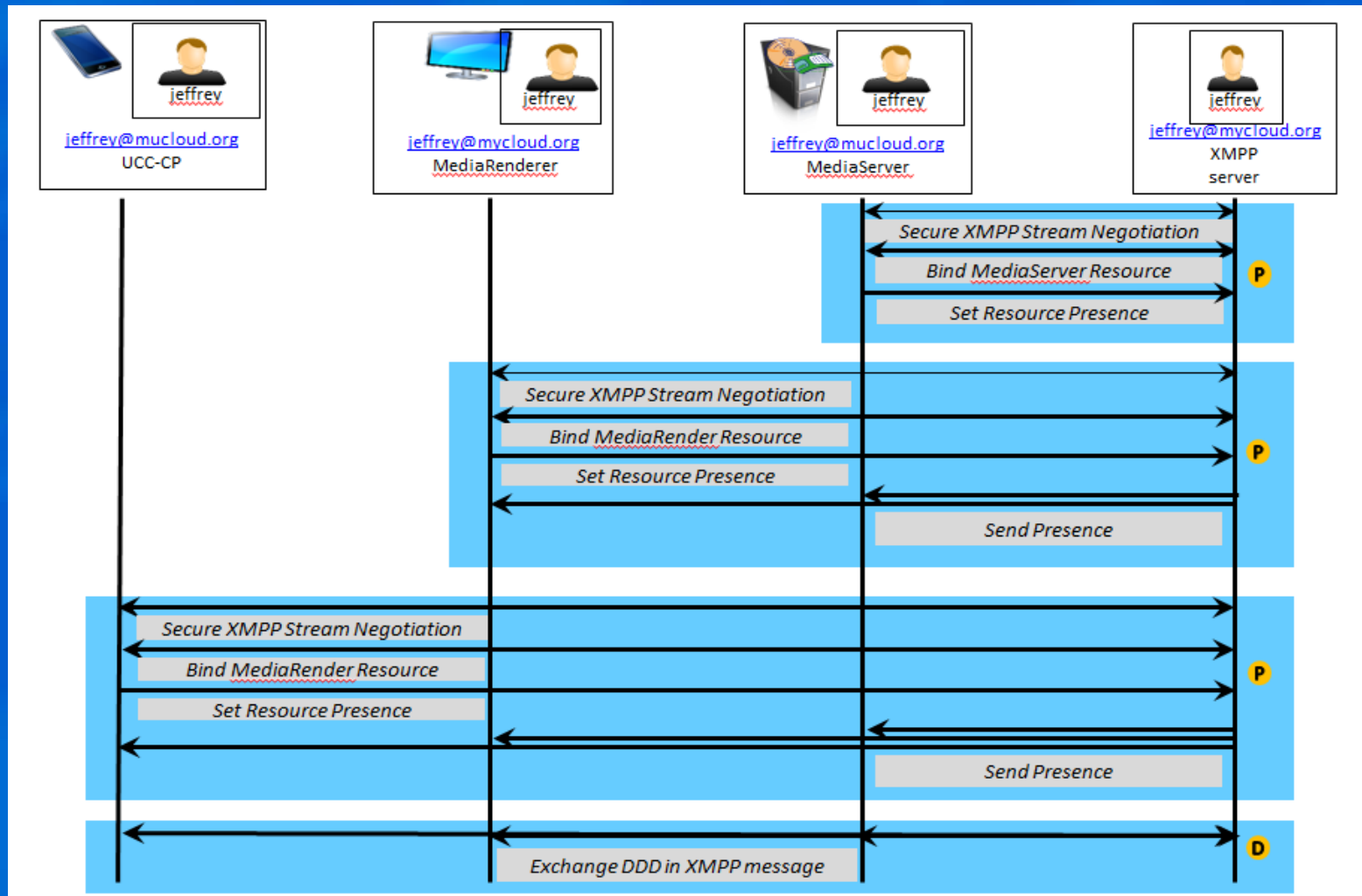
- Device A and B can talk to
- Each other by means of LAN A

Device can have LAN, WAN or simultaneous interfaces but a singular identity, similar to IPv4/IPv6

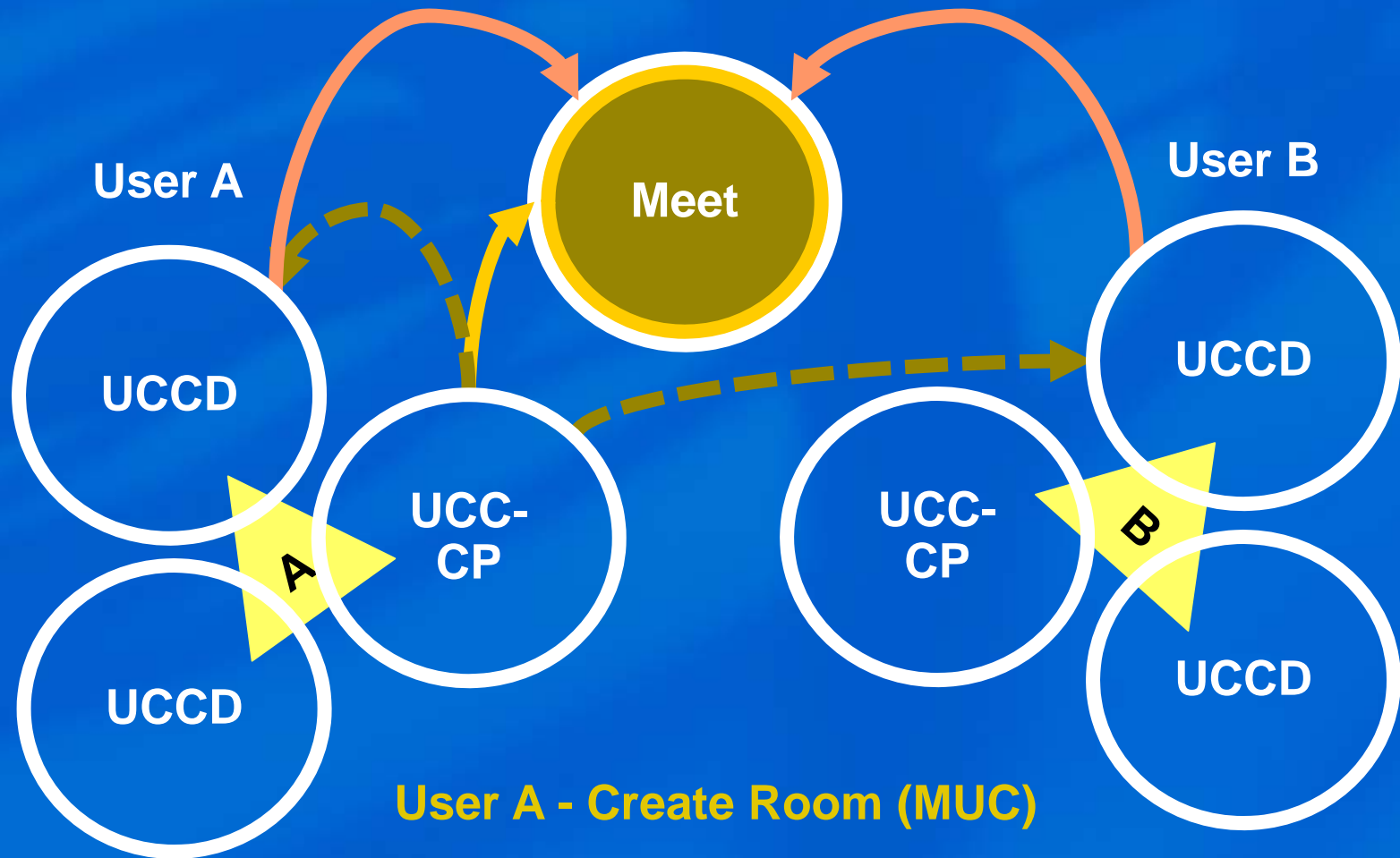
# (UDA +) UCA



# Basic Discovery & Description



# UPnP Cloud Interaction (MUC)



**User A - Create Room (MUC)**

**User A - Invite UCCDs and UCC-CPs (A&B)**

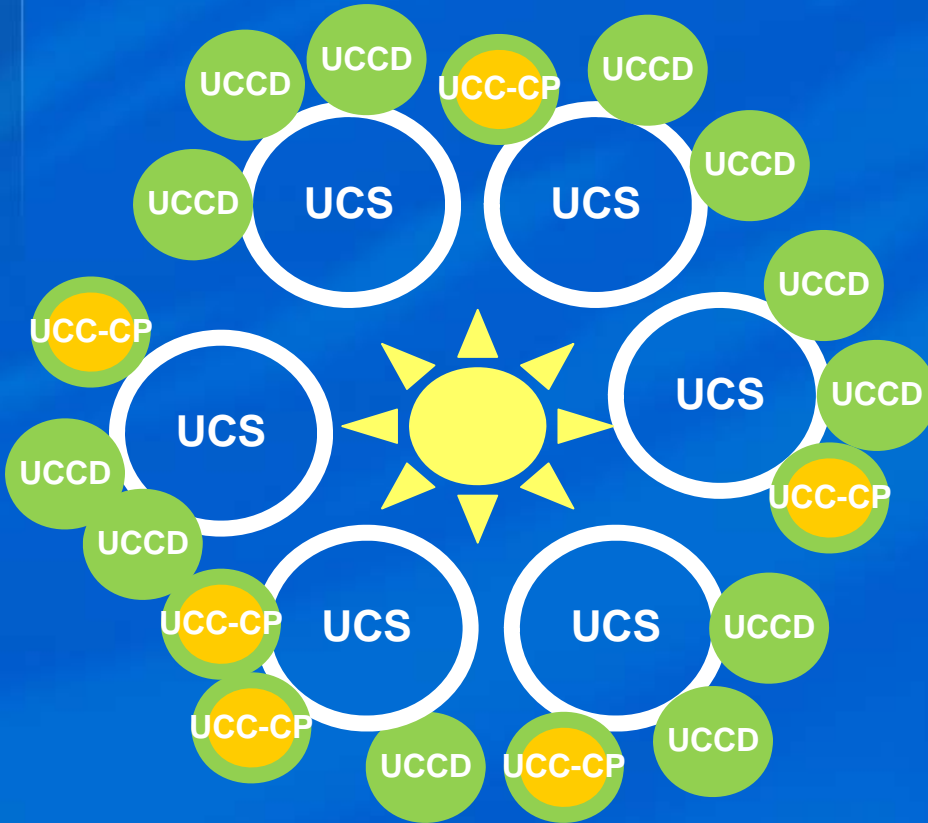
**User A & B - Meet and share**



# Potential Deployments

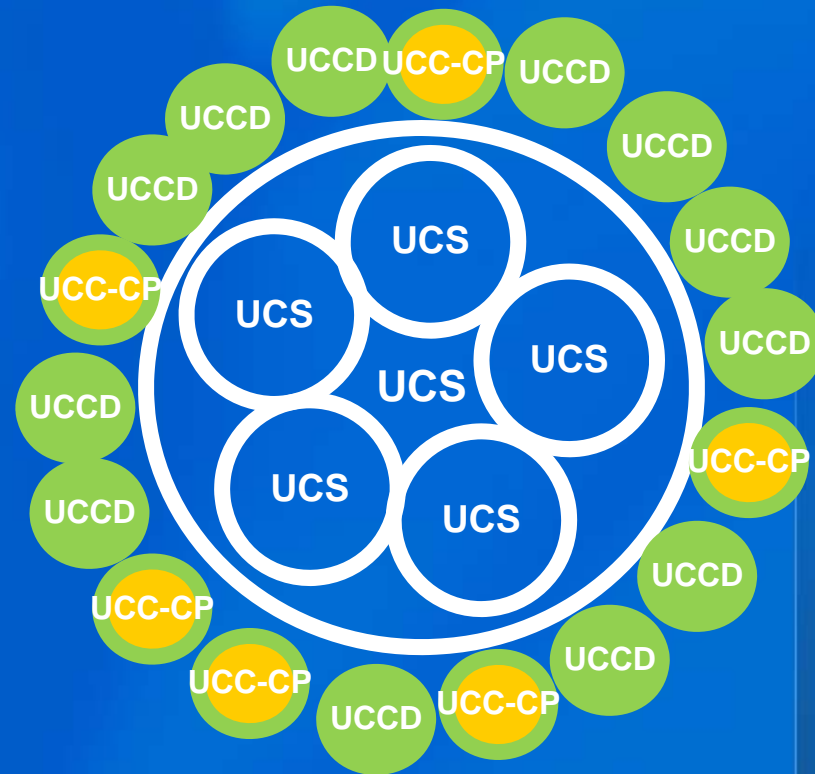
## UCS in gateways

Sparse mesh becomes dense mesh overtime



## Enterprise Scale

Federated - Single Domain, multiple rack servers.



Hybrid

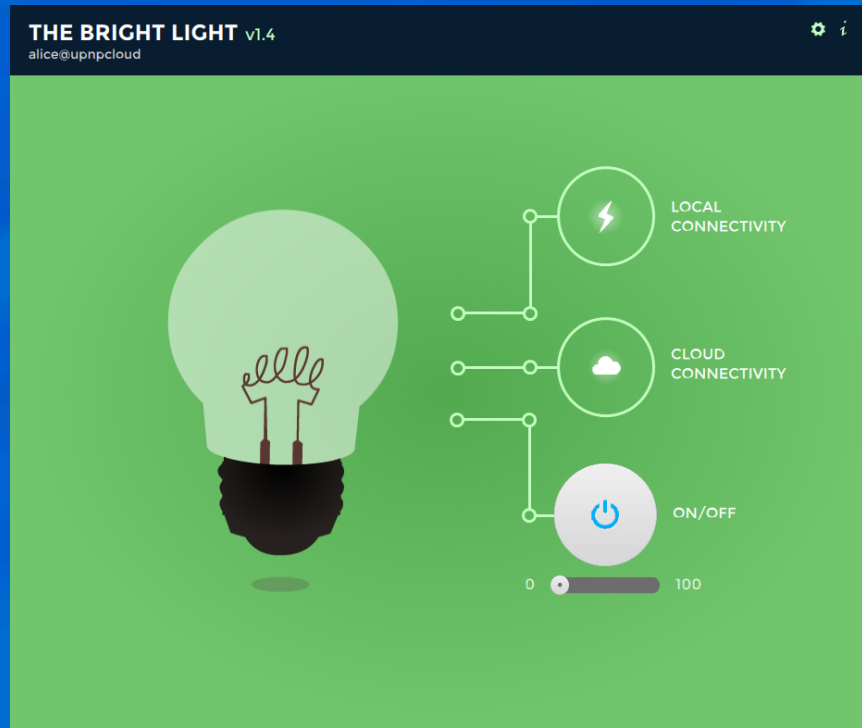
# UPnP Cloud: Schedule

- Design Complete (v0.80)
  - Completed – March, 2014
- Testing
  - ongoing
- Submission to Steering Committee
  - March, 2014
- Approval and Publication (UDA1.2)
  - June, 2014

# IOT configuration

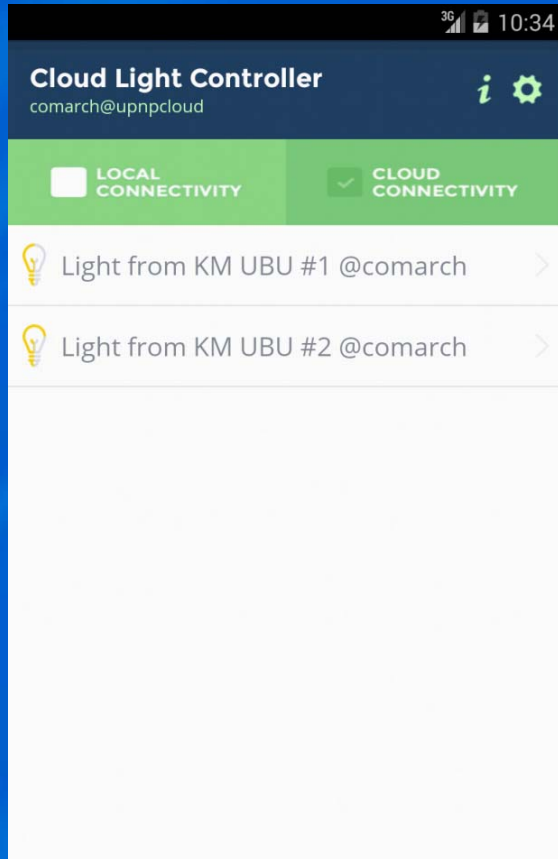
- Dimmable light, containing on/off switch, and dimming value, range between [0-100]
- Control point to
  - Select an dimmable light
  - control the on/off and dimming value of an selected dimmable light

# IoT: Device



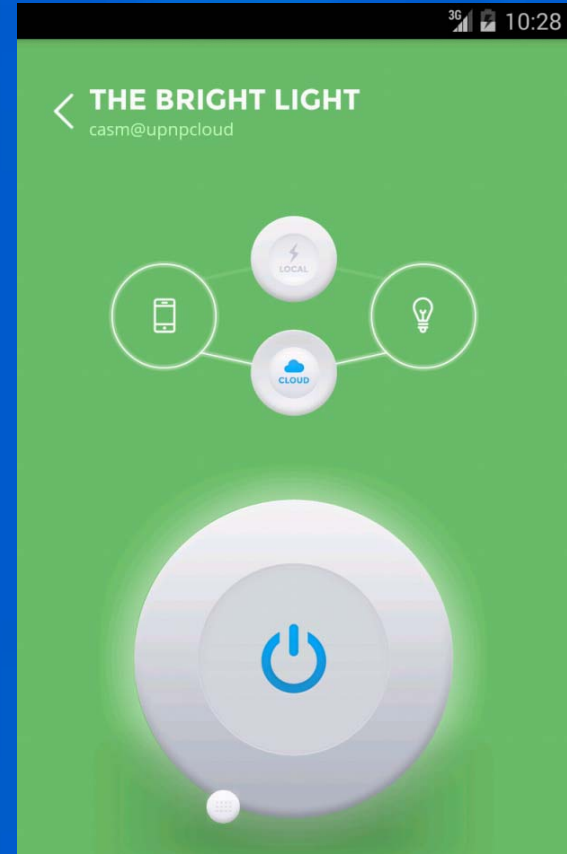
UCCD Connected  
DimmableLight(s)

# IoT UCA Control Point



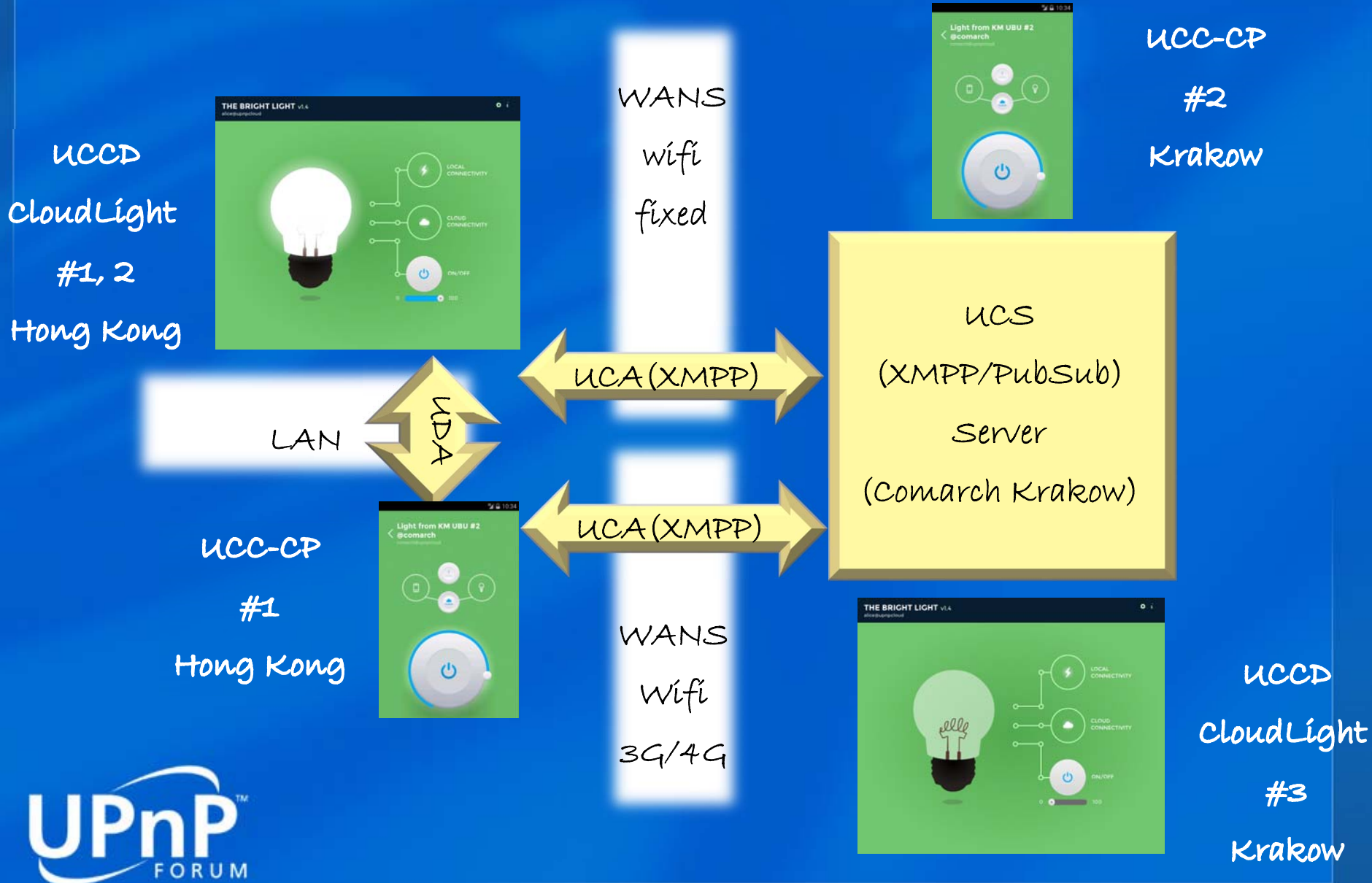
*UCC-CP UI*

*UCA Connected  
DimmableLight(s)*



*Light Control Interface*

# IoT Example configuration



# AV configuration

- 3- box configuration
- Control point can detect Media Servers
  - Select Media server
  - Select content on MediaServer
    - By using action CDS:Browse()
  - Select Media Renderer
  - Instruct play on Media Renderer by calling
    - AVT:SetAVTransportURI()
    - AVT:Play()



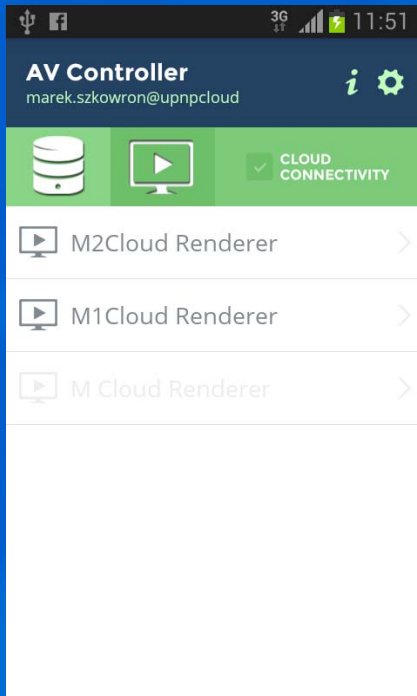
# AV Example configuration



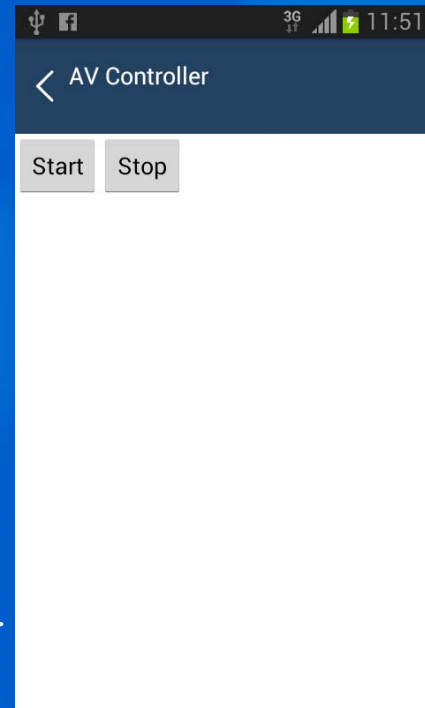


# UPnP Cloud: AV Control Point

UCC-CP AV



UCC-CP  
MediaServer  
Browse()



Discover  
MediaRender  
MediaServer  
Presence

UCC-CP  
MediaRender  
Play

# Multi-Screen Device Control Protocol

UPnP Forum



# Content

- Multi-Screen Trends
- Goal
- Terms used for Informative Usage
- UPnP Components of Multi-Screen DCP
  - Basic Interaction Model
  - Extended Interaction Model
- Services of Multi-Screen DCP
- Schedule – Phase 1

# Multi-Screen Trends

- Today multi-screen/second-screen solutions are proliferating
  - However, each is a proprietary vertical for particular vendor(s)
- Users expectations aren't being met:
  - Seamless interoperability across vendors
  - Ability for second screen integrated usages rather than 100s of different apps
- UPnP Forum members actively working to create an open interface to enable this interoperability between devices and applications
  - Already: CableLabs, Cisco, Intel, LGE (chair), Microsoft, PacketVideo, TP Vision, ZTE

# Goal

- Enable time-sensitive and interactive services, including implementation-specific applications, among various display devices
- Device/Service Discovery, Description, Eventing and Notification with the UPnP Device Architecture as the basic framework

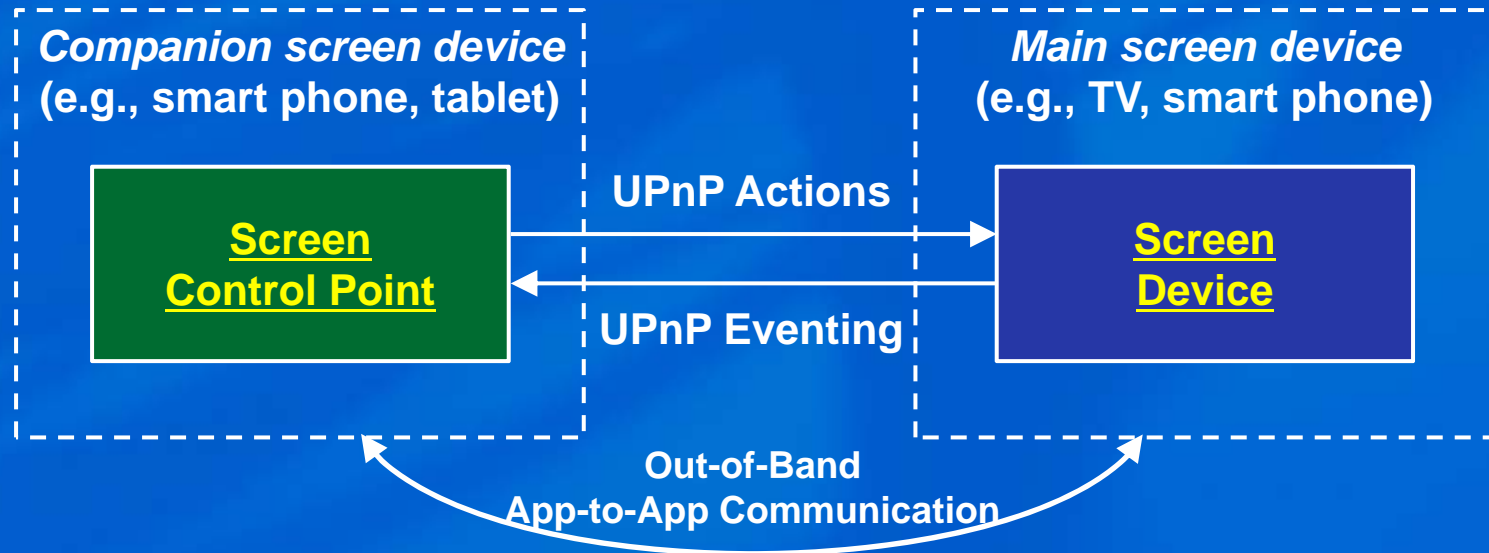
# Terms used for Informative Usage

- **Multi-Screen service** : Time-sensitive and interactive services, including implementation-specific applications, among various display devices. The display devices can be categorized into the *main screen device* and *companion screen device* by the roles and usages of the specific applications.
- **Main screen device** : Usually the *main screen device* is assumed as a lean-back display device such as a TV or set-top box which is controlled by *companion screen devices*. But any display device such as a smart phone, tablet, etc. can be a *main screen device* depending on usage scenarios.
- **Companion screen device** : Usually the *companion screen device* is assumed as a lean-forward & handheld display device such as a smart phone or tablet which controls *main screen devices*. But any display device such as a TV or set-top box, etc. can be a *main screen device* depending on usage scenarios.

# UPnP Components designed by Multi-Screen DCP

- **Screen Device**: a UPnP component used to provide various interactive services (i.e., *Multi-Screen services*) with other display devices which are implemented with the **Screen Control Point**. It supports the Eventing mechanism and is controlled by the **Screen Control Point**.
- **Screen Control Point**: a UPnP component used to provide various interactive services (i.e., *Multi-Screen services*) with other display devices which are implemented with the **Screen Device**. It receives the Eventing messages from and controls the **Screen Device**.

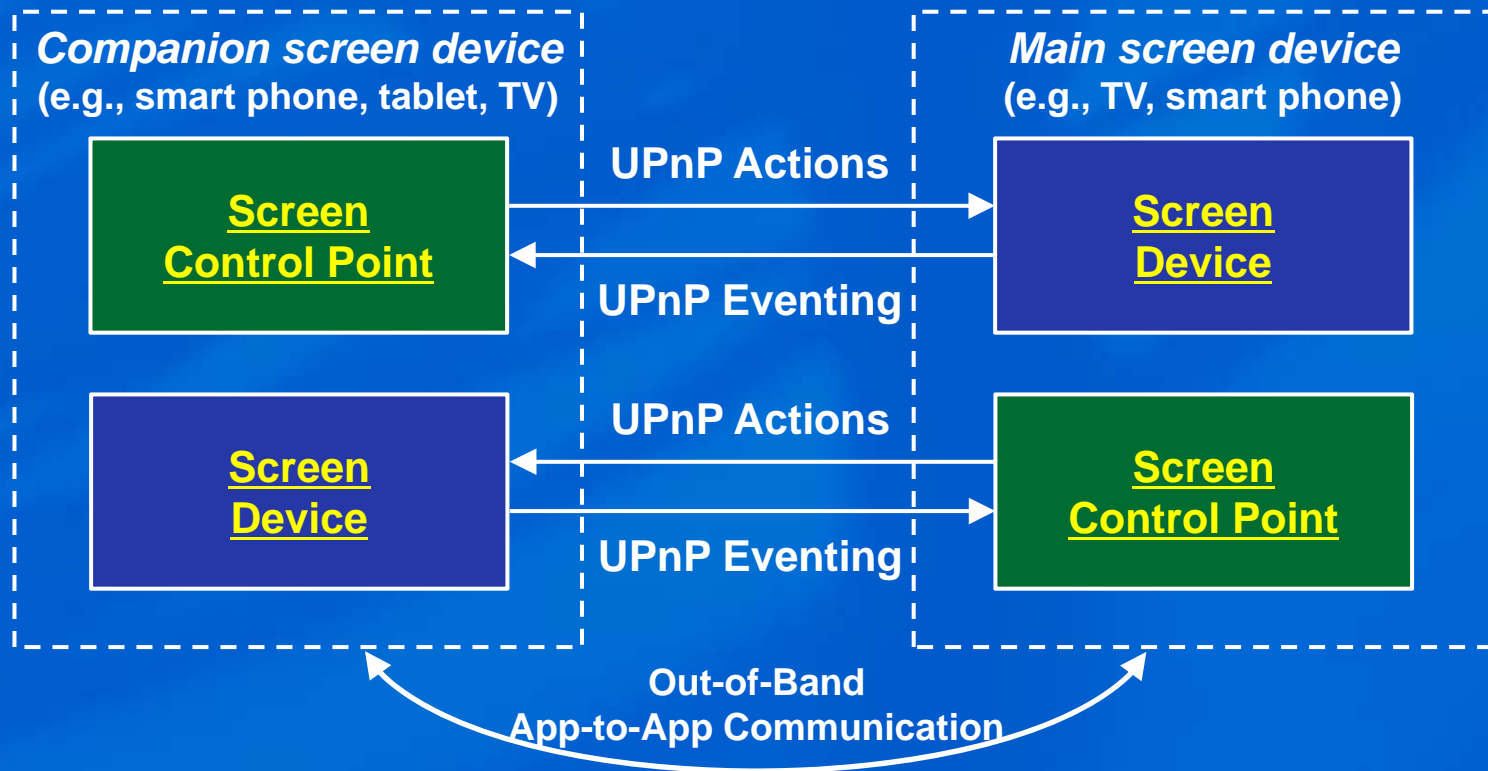
# Basic Interaction Model



- ✓ The Basic Interaction Model can be applied to the use cases requiring interactions between multiple *Main screen devices* and multiple *Companion screen devices*.



# Extended Interaction Model



- ✓ The Extended Interaction Model can provide more sophisticated interactions and flexible architectures. I.e., it allows *Main screen devices* to interact with each other, and *Companion screen devices* to interact with each other.

# Services of Multi-Screen DCP

- Phase 1
  - Application Management
    - Multi-Screen service notification, Remote App installation/activation, App information/status transfer
  - App-to-App Communication Management
    - Configure and Setup/Teardown App-to-App communication
  - Key-Press Protocol (being considered)
  - Synchronization (being considered)
- Phase 2
  - Gathering new requirements

# Schedule – Phase 1

- Preliminary Design Completion (v0.80)
  - March 31<sup>st</sup>, 2014
- Plugfest
  - April 30<sup>th</sup>, 2014
- Design Complete date
  - May 15<sup>th</sup>, 2014
- Submission to Steering Committee
  - May 31<sup>st</sup>, 2014
- Approval and Publication (v1.0)
  - July 31<sup>st</sup>, 2014

# UPnP IoT

UPnP Forum

# UPnP IoT

- Brand new activity in UPnP!
- UPnP IOT is collecting use cases, technical requirements and developing an architecture to meet IoT requirements consistent with the UPnP ecosystem.
- The Architecture requirements at a basic level:
  - Top level connectivity is IP
  - Define a simple way to accommodate new devices
  - Be able to integrate diverse networks (ZigBee, Zwave, ANT ...)
  - Support devices in diverse locations
  - Provide reliable security
  - Curate IoT device interfaces and make them easily definable and accessible.

# UPnP IoT assets

- UPnP Device Architecture
  - Discovery, security, management, control, eventing, IPv6, etc.
- DCPs
  - Lights/switches, thermostat, blinds, Digital Security Cameras, A/V
- SensorManagement
  - DCPs condensed to XML structure
  - Bridging to other protocols
  - Actuator control
- Cloud Annex
  - Cloud architecture based on XMPP



**For the interconnected lifestyle**