IoT Practical PlugFest
Office Lighting System

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SAN

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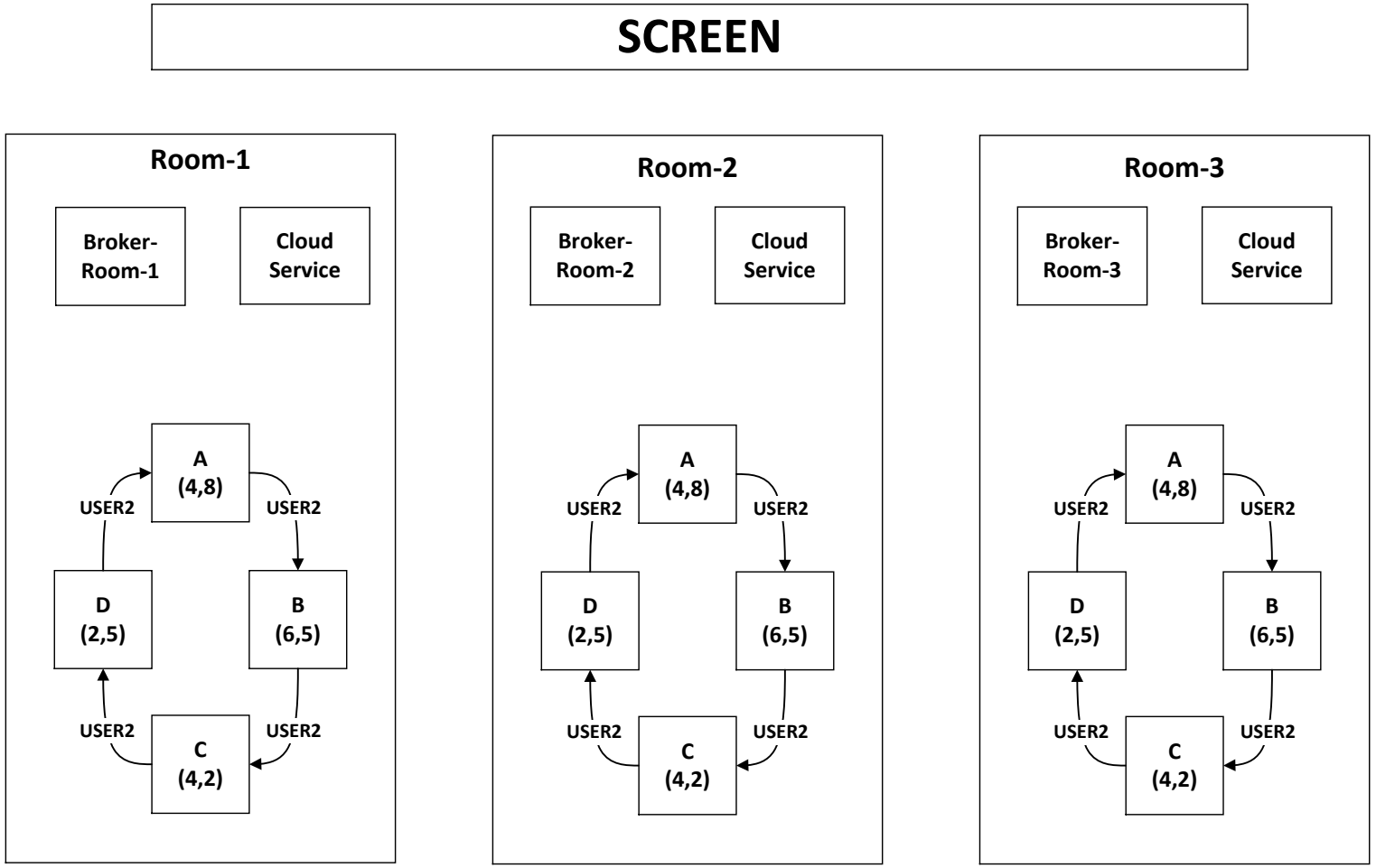
Where innovation starts

Seating Arrangement



OwnershipPriority.json for Light Devices in Location A


```
[{
  "user_type": "USER1",
  "user_id": "Office-Worker-A",
  "sensor_id": "Sensor-Device-A-1",
  "light_color": "(255, 255, 255)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 8.0
 },
 {
  "user_type": "USER3",
  "user_id": "Office-Worker-B",
  "sensor_id": "Sensor-Device-B-1",
  "light_color": "(255, 0, 0)",
  "low_light": false,
  "user_location_x": 6.0,
  "user_location_y": 5.0
  },
{
  "user_type": "USER3",
  "user_id": "Office-Worker-C",
  "sensor_id": "Sensor-Device-C-1",
  "light_color": "(0, 255, 0)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 2.0
  },
{
  "user_type": "USER2",
  "user_id": "Office-Worker-D",
  "sensor_id": "Sensor-Device-D-1",
  "light_color": "(0, 0, 255)",
  "low_light": true,
  "user_location_x": 2.0,
  "user_location_y": 5.0
 }]
```

OwnershipPriority.json for Light Devices in Location B


```
[{
  "user_type": "USER2",
  "user_id": "Office-Worker-A",
  "sensor_id": "Sensor-Device-A-1",
  "light_color": "(255, 255, 255)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 8.0
 },
 {
  "user_type": "USER1",
  "user_id": "Office-Worker-B",
  "sensor_id": "Sensor-Device-B-1",
  "light_color": "(255, 0, 0)",
  "low_light": false,
  "user_location_x": 6.0,
  "user_location_y": 5.0
  },
{
  "user_type": "USER3",
  "user_id": "Office-Worker-C",
  "sensor_id": "Sensor-Device-C-1",
  "light_color": "(0, 255, 0)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 2.0
  },
{
  "user_type": "USER3",
  "user_id": "Office-Worker-D",
  "sensor_id": "Sensor-Device-D-1",
  "light_color": "(0, 0, 255)",
  "low_light": true,
  "user_location_x": 2.0,
  "user_location_y": 5.0
 }]
```

OwnershipPriority.json for Light Devices in Location C


```
[{
  "user_type": "USER3",
  "user_id": "Office-Worker-A",
  "sensor_id": "Sensor-Device-A-1",
  "light_color": "(255, 255, 255)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 8.0
 },
 {
  "user_type": "USER2",
  "user_id": "Office-Worker-B",
  "sensor_id": "Sensor-Device-B-1",
  "light_color": "(255, 0, 0)",
  "low_light": false,
  "user_location_x": 6.0,
  "user_location_y": 5.0
  },
{
  "user_type": "USER1",
  "user_id": "Office-Worker-C",
  "sensor_id": "Sensor-Device-C-1",
  "light_color": "(0, 255, 0)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 2.0
  },
{
  "user_type": "USER3",
  "user_id": "Office-Worker-D",
  "sensor_id": "Sensor-Device-D-1",
  "light_color": "(0, 0, 255)",
  "low_light": true,
  "user_location_x": 2.0,
  "user_location_y": 5.0
 }]
```

OwnershipPriority.json for Light Devices in Location D


```
[{
  "user_type": "USER3",
  "user_id": "Office-Worker-A",
  "sensor_id": "Sensor-Device-A-1",
  "light_color": "(255, 255, 255)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 8.0
 },
 {
  "user_type": "USER3",
  "user_id": "Office-Worker-B",
  "sensor_id": "Sensor-Device-B-1",
  "light_color": "(255, 0, 0)",
  "low_light": false,
  "user_location_x": 6.0,
  "user_location_y": 5.0
  },
{
  "user_type": "USER2",
  "user_id": "Office-Worker-C",
  "sensor_id": "Sensor-Device-C-1",
  "light_color": "(0, 255, 0)",
  "low_light": false,
  "user_location_x": 4.0,
  "user_location_y": 2.0
  },
{
  "user_type": "USER1",
  "user_id": "Office-Worker-D",
  "sensor_id": "Sensor-Device-D-1",
  "light_color": "(0, 0, 255)",
  "low_light": true,
  "user_location_x": 2.0,
  "user_location_y": 5.0
 }]
```

Execute the System

1. Run the broker
   a) Please specify whether the broker runs mDNS/DNS-SD server
2. Run the Light Devices and the Sensor Devices
   a) If the Light/Sensor Devices do not run Avahi client, get and set the IP address of the broker manually
   b) Take necessary screen shots of the broker discovery
3. Run the cloud service
   a) If the cloud service do not run Avahi client, get and set the IP address of the broker manually
   b) Take necessary screen shots of the broker discovery

Set User Account

- **Set a user account for each location**

No	Data	Format	Example
1	UserID	“Office-Worker-GroupNo”	“Office-Worker-A”
2	GroupNo	Integer	A
3	RoomID	“Room-No”	“Room-1”
4	Name	“Last Name, First Name”	“Worker, OfficeA”
5	Email	Email format	“WOA@tue.nl”
6	Password	“pwd-GroupNo”	“pwd-A”

- **Change “A” to the number of the group sitting on location A**
- **Adjust RoomID to the right Room-No**
- **Follow this for location B, C and D.**
- **Take necessary screen shots**

Set Identity and Binding

- **The building manager sets the Group No, Location X, Location Y and Room ID of all the Light and Sensor Devices in the room**
- **Take necessary screen shots**

Set Ownership Priority

- The cloud hosts four PriorityOwnership.json files for location A, B, C and D
- Example of path for the URL: ../priority/group#/PriorityOwnership.json
- Send to the broker the right URL for each group
- The correct URLs are received by all the Light Devices
- The Light Devices download the files based on the URLs
- The Light Devices received the correct PriorityOwnership.json file
- Take necessary screen shots

Observe State, Adaptive Lighting (1)

1. The Building Manager open the Observe State menu and look at state changes of the Light and Sensor Devices in the room
2. Location A is occupied
   - The lights in location A and B should turn to the light setting of Office-Worker-A.
   - The lights in location C and D should turn to dim setting
   - Take necessary screen shots
3. Location B is occupied
   - The lights in location B and C should turn to the light setting of Office-Worker-B.
   - The lights in location D stays dim
   - Take necessary screen shots
4. Location C is occupied
   - The lights in location C and D should turn to the light setting of Office-Worker-C.
   - Take necessary screen shots
5. Location D is occupied
   - The lights in location D should turn to the light setting of Office-Worker-D
   - Take necessary screen shots

Observe State, Adaptive Lighting (2)

6. Location A becomes free
   - The lights in location A should turn to the light setting of Office-Worker-D.
   - Take necessary screen shots
7. Location B becomes free
   - The lights in location B should turn to dim setting
   - Take necessary screen shots
8. Location C becomes free
   - The lights in location C should turn to dim setting.
   - Take necessary screen shots
9. Location D becomes free
   - All the lights in the room should go off
   - Take necessary screen shots

Adjust Lighting (1)

1. Location A is occupied
   - The lights in location A and B should turn to the light setting of Office-Worker-A.
2. Office-Worker-A logs-in on the user app and changes its light setting
   - Light Devices in location A and B changes its setting to the new light setting of Office-Worker-A
   - Take necessary screen shots
3. Office-Worker-A is taking ownership Light Devices in location C and D, and changes them to new light setting
   - Light Devices in location C and D changes its setting to the new light setting set by Office-Worker-A
   - Take necessary screen shots
4. Location B is occupied
   - The lights in location B and C should turn to the light setting of Office-Worker-B.
5. Office-Worker-B logs-in on the user app and changes its light setting
   - Light Devices in location B and C changes its setting to the new light setting of Office-Worker-B
   - Take necessary screen shots
6. Office-Worker-B is taking ownership Light Devices in location D, and changes them to new light setting
   - Light Devices in location D changes its setting to the new light setting set by Office-Worker-B
   - Take necessary screen shots

Adjust Lighting (2)

7. Location C is occupied
   - The lights in location C and D should turn to the light setting of Office-Worker-C.
8. Office-Worker-C logs-in on the user app and changes its light setting
   - Light Devices in location C and D changes its setting to the new light setting of Office-Worker-C
   - Take necessary screen shots
9. Location D is occupied
   - The lights in location D should turn to the light setting of Office-Worker-D
10. Office-Worker-D logs-in on the user app and changes its light setting
    - Light Devices in location D changes its setting to the new light setting of Office-Worker-D
    - Take necessary screen shots
11. Location A becomes free
    - The lights in location A should turn to the light setting of Office-Worker-D.
12. Location B becomes free
    - The lights in location B should turn to dim setting

Adjust Lighting (3)

11. Office-Worker-D is taking over Light Devices in Location B and changes the light setting of those devices.
    - The lights in location B should turn to the new light setting set by Office-Worker-D
    - Take necessary screen shots
12. Office-Worker-C is taking over Light Devices in Location B and changes the light setting of those devices.
    - The lights in location B should turn to the new light setting set by Office-Worker-C
    - Take necessary screen shots
13. Location C becomes free
    - The lights in location C and B should turn to dim setting.
14. Office-Worker-D is taking over Light Devices in Location B and C and changes the light setting of those devices.
    - The lights in location B and C should turn to the new light setting set by Office-Worker-D
    - Take necessary screen shots
15. Location D becomes free
    - All the lights in the room should go off

Update Priority Ownership

- Since the Ownership Priority configuration has been changed from the previous test cases, we will send the original OwnershipPriority.json files to each Light Devices.
- This will reset the configuration to original setting
- The building manager sends the right URL of the OwnershipPriority.json file to all the Light Devices
- Start again the previous Adaptive Lighting and Adjust Lighting test cases and check if the system works as they should.

Set Behavior Deployment

1. The building manager sets the Behavior Deployment resource to the string “Broker”
   - Take necessary screen shots
2. The Light Devices deactivated its distributed behavior mode
   - Take necessary screen shots
3. The Light Devices deactivates its distributed behavior mode and the Broker activates its
4. Re-run the Adaptive Lighting and Adjust Lighting test cases and check if the system works as they should.

Update Light Behavior

- The building manager sends the right URL of the update file to the corresponding Light Devices
- The Light Devices download the update file.
- The Light Devices automatically run the new behavior
- The Light Devices change their color randomly every second.