Project : Light Follow Me

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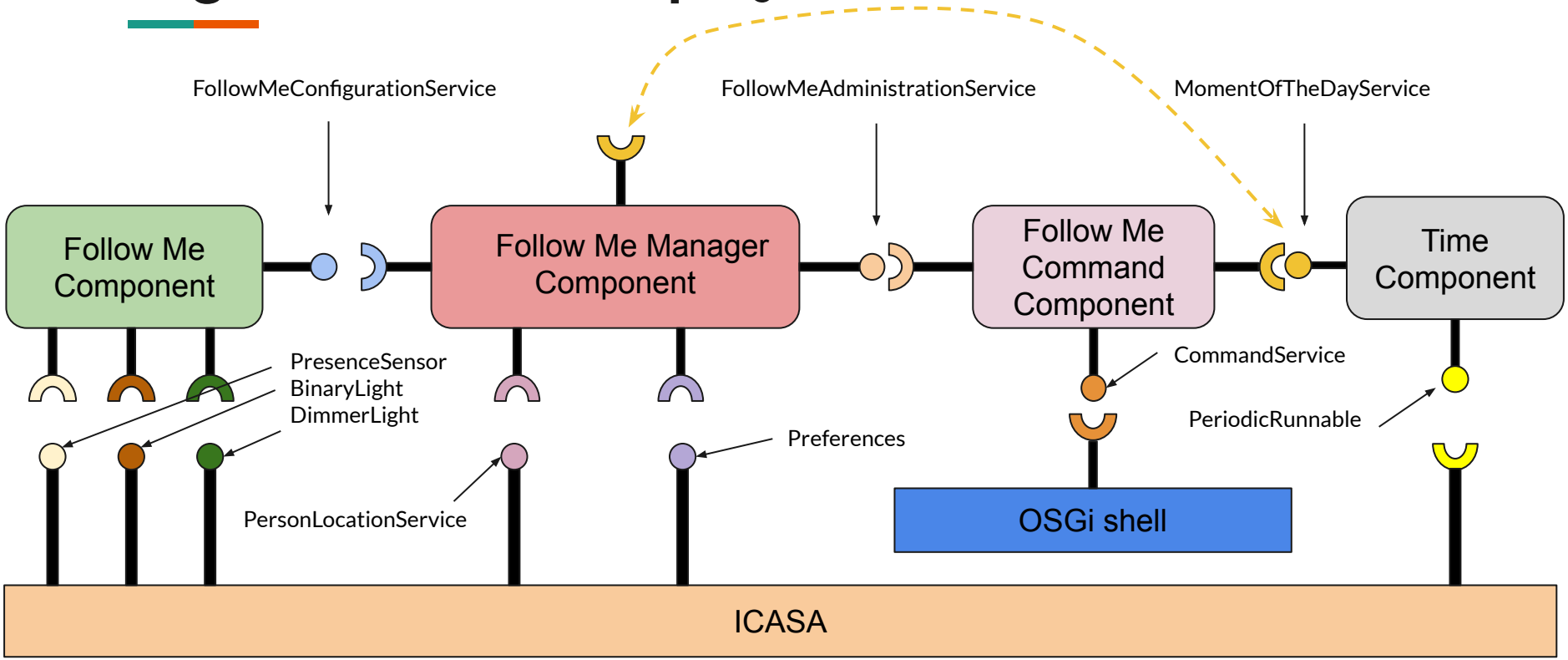
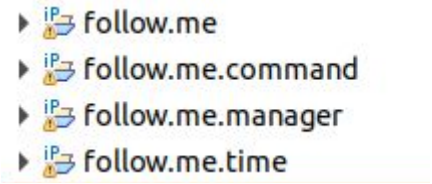
Organization of the project

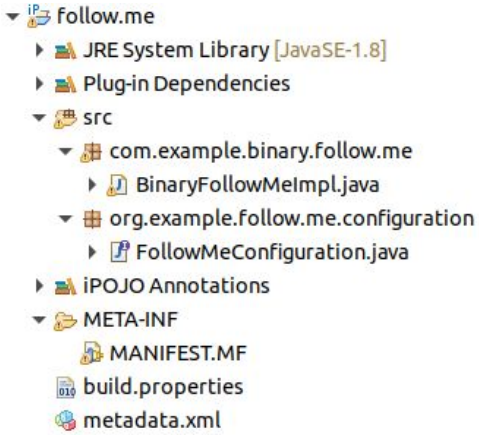


Organization in Eclipse

- 4 iPojo Projects : 1 for each bundle



- Important elements in a project :
  - Implementation Class
  - Interface(s)
  - Enum(s)
  - MANIFEST.MF
  - metadata.XML



follow.me project example

Scenario 1 : Basic Follow me

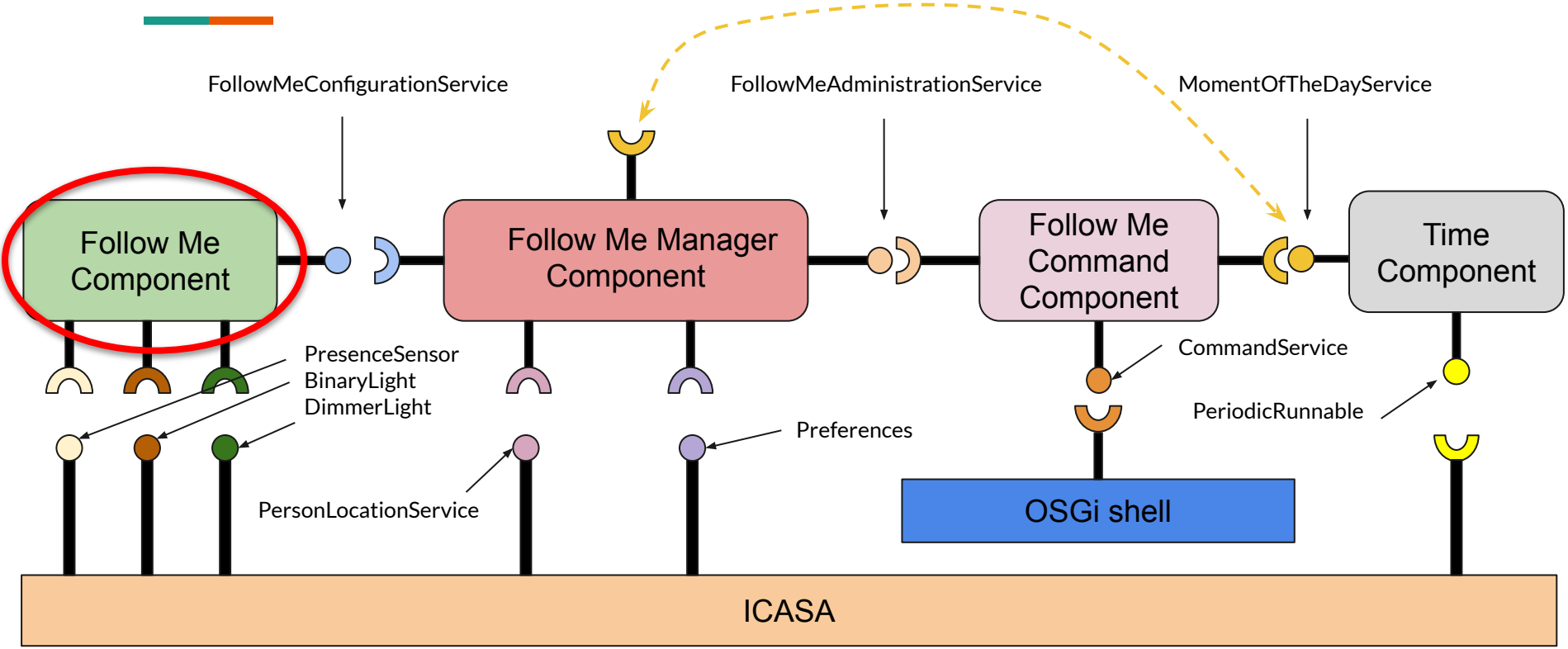
- User in a room must light on binary lights thanks to a presence sensor
  - PresenceSensor Interface
  - BinaryLight Interface

- The user can move from one room to another
  - Listens to device property changes thanks to DeviceListener Interface
  - Adapt the devices state

- Several users can be in the flat

- We can move binary lights also but not the presence sensors

Scenario 1 : Basic Follow me



Scenario 1 : Basic Follow me

```java
/** Field for presenceSensors dependency */
private PresenceSensor[] presenceSensors;
/** Field for binaryLights dependency */
private BinaryLight[] binaryLights;


/**
 * Bind Method for presenceSensors dependency
 * This method is used to manage device listener
 */
public void bindPeresenceSensor(PresenceSensor presenceSensor, Map properties) {
    System.out.println("bind presence sensor " + presenceSensor.getSerialNumber());
    // Add the listener to the presence sensor
    presenceSensor.addListener(this);
}
/**
 * Unbind Method for presenceSensors dependency
 * This method is used to manage device listener
 */
public void unbindPresenceSensor(PresenceSensor presenceSensor, Map properties) {
    System.out.println("unbind presence sensor " + presenceSensor.getSerialNumber());
    // Remove the listener from the presence sensor
    presenceSensor.removeListener(this);
}

/** Bind Method for binaryLights dependency */
public void bindBinaryLights(BinaryLight binaryLight, Map properties) {
    System.out.println("bind binary light " + binaryLight.getSerialNumber());
    binaryLight.addListener(this);
}

/** Unbind Method for binaryLights dependency */
public void unbindBinaryLights(BinaryLight binaryLight, Map properties) {
    System.out.println("unbind binary light " + binaryLight.getSerialNumber());
    binaryLight.removeListener(this);
}
```

Scenario 1 : Basic Follow me

- User Movement

Scenario 1 : Basic Follow me

- Binary Light movement + Several users

Scenario 2 : Follow me with dimmer lights

dimmer light

Scenario 3 : Follow me with Illuminance Preference

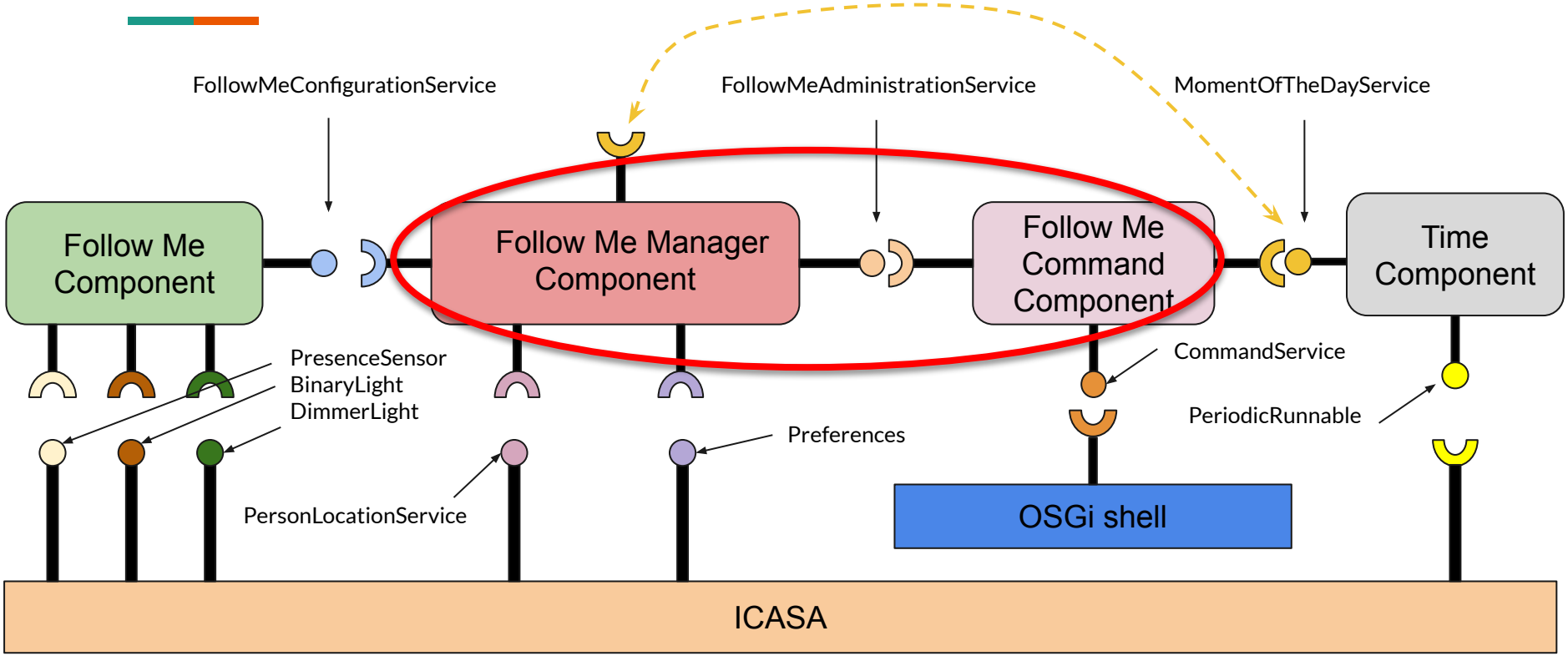
- We can set the maximum number of lights to turn on in a room
  - Adapt the light states when a light moves

- We can set the illuminance goal in the flat
  - Illuminance Goal Enum : SOFT, MEDIUM, FULL

- We can set the Energy goal per room
  - Energy Goal Enum : LOW, MEDIUM, HIGH
  - 1 Binary Light = 100 W
  - 1 Dimmer Light = [0;100] W

- We can set these values directly from the terminal
  - Manager component
  - Command component

Scenario 3 : Follow me with Illuminance Preference



Scenario 3 : Follow me with Illuminance Preference

SOFT illuminance

MEDIUM illuminance

Scenario 3 : Follow me with Illuminance Preference

HIGH Illuminance

Scenario 3 : Follow me with Illuminance Preference

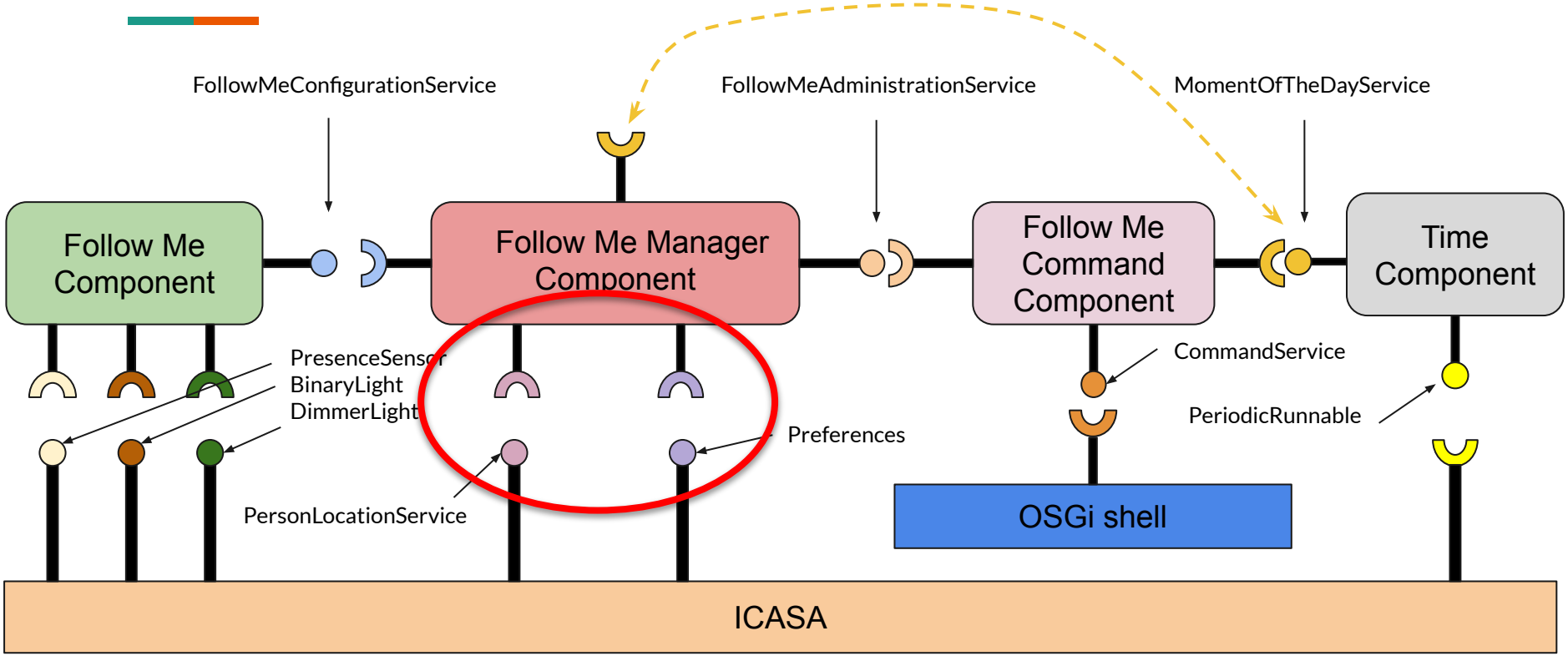
- Energy goal and illuminance preference are intertwined
  - Define Illuminance Preference -> Set the corresponding Energy Goal
  - Define Energy Goal -> Set the corresponding Illuminance Preference

```
admin@wisdom>getEnergyPreference
Energy mode = LOW
admin@wisdom>getIlluminancePreference null
The illuminance goal for everybody is  SOFT
```

Scenario 4 : Illuminance Preference for Users

- Set a different illuminance preference for users with the terminal
- The Illuminance is still global
- When conflict, apply a medium illuminance preference
  - Exemple : Paul with SOFT(1) and Marie with HIGH(3) will turn on 2 lights

Scenario 4 : Illuminance Preference for Users

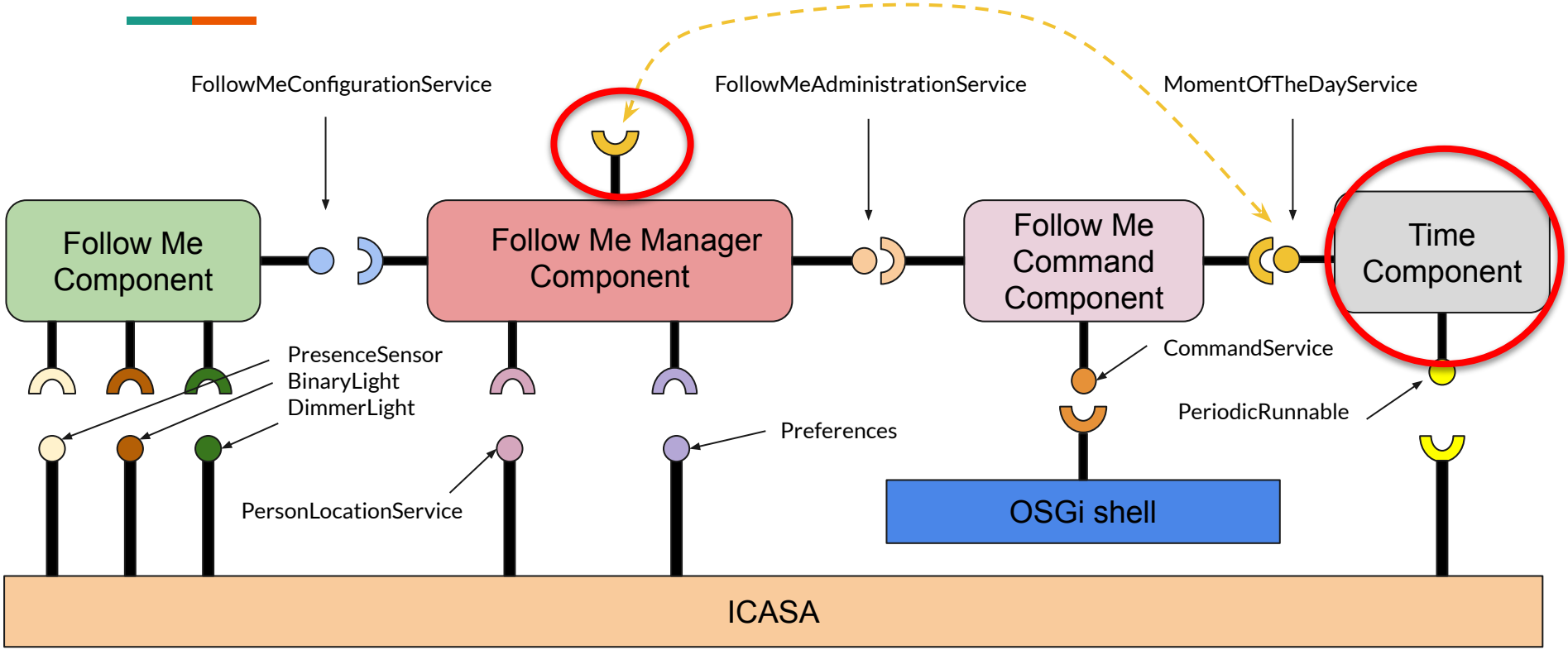


Scenario 4 : Illuminance Preference for Users

- Conflict example

```
admin@wisdom>setIlluminancePreference Paul HIGH
[Paul]
[INFO      o.o.c.s.x.SharedPreferencesServiceImpl] {vert.x-eventloop-thread-0}
 - Returning existing prefs User-Paul: org.ow2.chameleon.sharedprefs.xml.SharedPreferencesImpl
@cf93d5e
Pref is : 3
admin@wisdom>setIlluminancePreference Marie SOFT
[Marie, Paul]
[INFO      o.o.c.s.x.SharedPreferencesServiceImpl] {vert.x-eventloop-thread-0}
 - Returning existing prefs User-Marie: org.ow2.chameleon.sharedprefs.xml.SharedPreferencesImp
l@31131be2
[INFO      o.o.c.s.x.SharedPreferencesServiceImpl] {vert.x-eventloop-thread-0}
 - Returning existing prefs User-Paul: org.ow2.chameleon.sharedprefs.xml.SharedPreferencesImpl
@cf93d5e
Pref is : 2
admin@wisdom
```

Adding Time


FollowMeConfigurationService
FollowMeAdministrationService
MomentOfTheDayService
Follow Me Component
Follow Me Manager Component
Follow Me Command Component
Time Component
PresenceSensor
BinaryLight
DimmerLight
CommandService
PeriodicRunnable
Preferences
PersonLocationService
OSGi shell
ICASA

Adding Time

- The day is decomposed in 4 moments of the day
  - NIGHT, MORNING, AFTERNOON, EVENING
- Can ask for the moment of the day with the shell
- Problem of initialization : Time may be out of sync with the simulation.
- The Manager Component listens to the moment of the day but only prints a message
- Could use the moment of the day to compute different illuminance goal

Adding Time

```
admin@wisdom>getMomentOfTheDay
Moment of the day : MORNING
admin@wisdom>getMomentOfTheDay
Moment of the day : AFTERNOON
admin@wisdom>getMomentOfTheDay
Moment of the day : EVENING
admin@wisdom>getMomentOfTheDay
Moment of the day : NIGHT
```

```
One hour has elapsed....
One hour has elapsed....
One hour has elapsed....
One hour has elapsed....
```

Assessment of the implemented part

- Architecture : Hierarchy
  - Command manages the inputs/outputs with the shell
  - Time manages the time of the Simulation
  - Manager manages preferences and users
  - Application manages the devices and zones

- Difficulties : The Persons and Zones are not instances of services as for devices
  - Need to find another way to manage the list of zone and person (LocationService, DeviceListener,...)

Work to be done : Separate Users

- One preference for each user : not a global illuminance preference

- Change the architecture structure
  - The manager must listen people and zones modifications
  - The Follow Me component already updates the lights values per zone

Thank you for your attention !