Tizen/Artik IoT Lecture Chapter 11. IoTivity Resource Hosting & Resource Directory

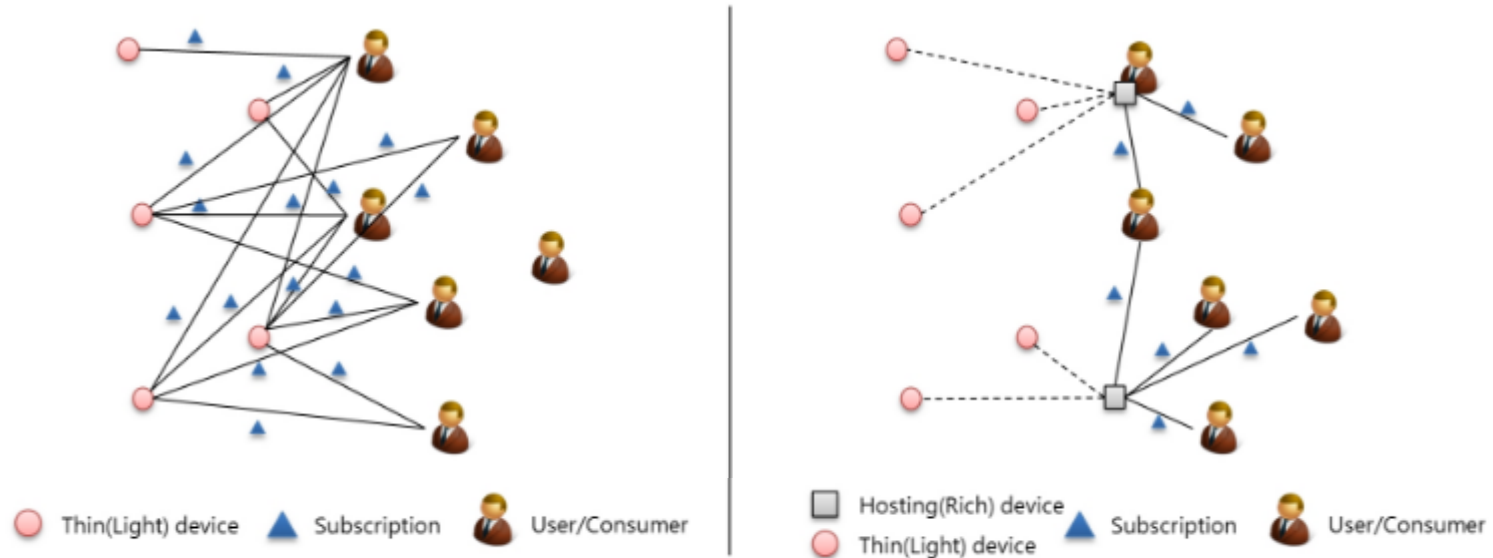Sungkyunkwan University

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Resource Hosting

- **IoTivity service to off-load the requests to the resources in thin device**
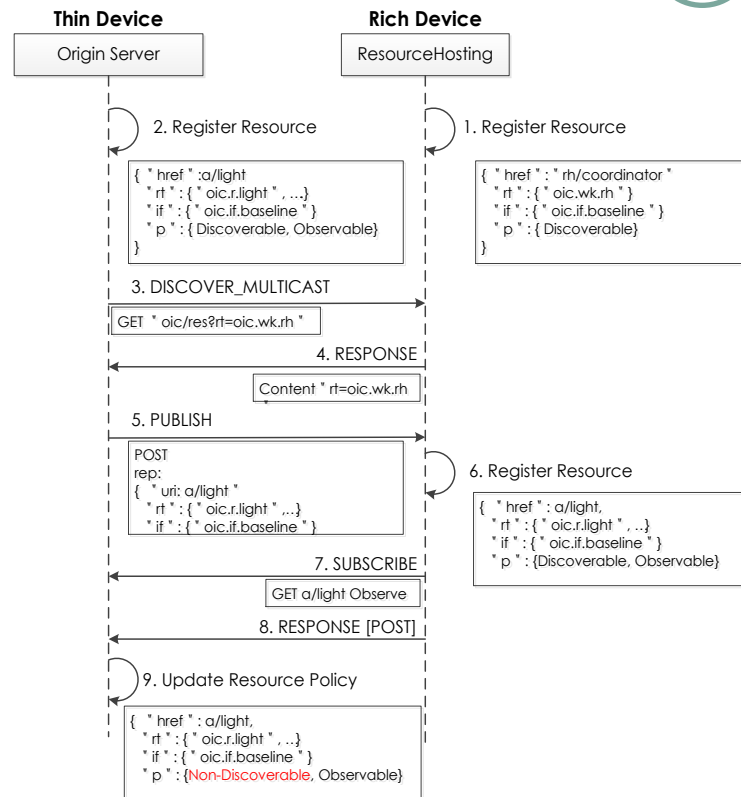

Thin(Light) device ▲ Subscription 👤 User/Consumer

Hosting(Rich) device
Thin(Light) device ▲ Subscription 👤 User/Consumer

Resource Hosting Design

- **Transfer the origin resource to ResourceHosting**

- **Subscribe the origin resource from the ResourceHosting (Observe)**

- **Make the origin resource non-discoverable**
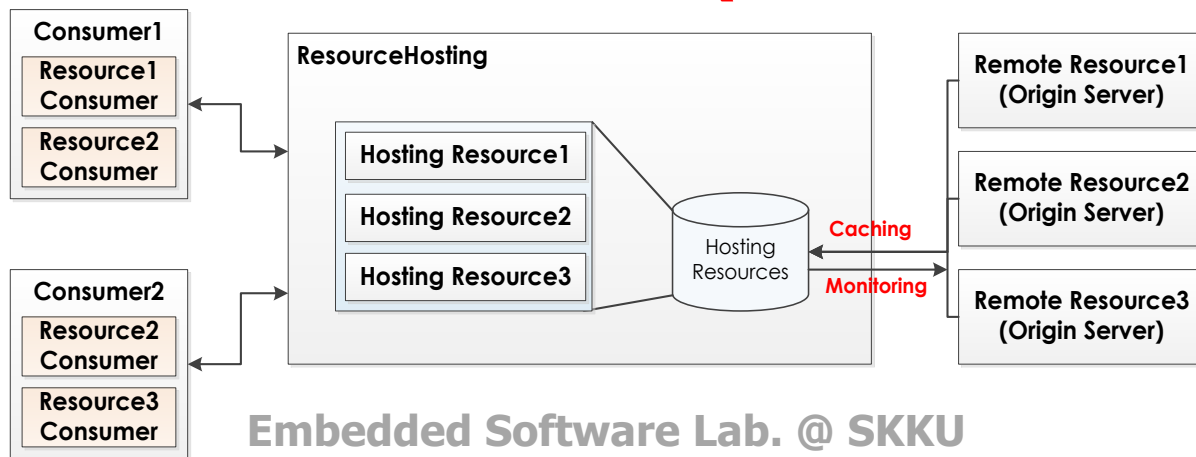 - It cannot be discovered from other service than ResourceHosting

Resource Hosting in IoTivity

- **RemoteResource → startMonitoring()
  RemoteResource → startCaching()**
  - ResourceHosting observes and caches the origin resource and transfers the cached resource to the consumer

- **Maintain the Mirror Server (Not same resource)**
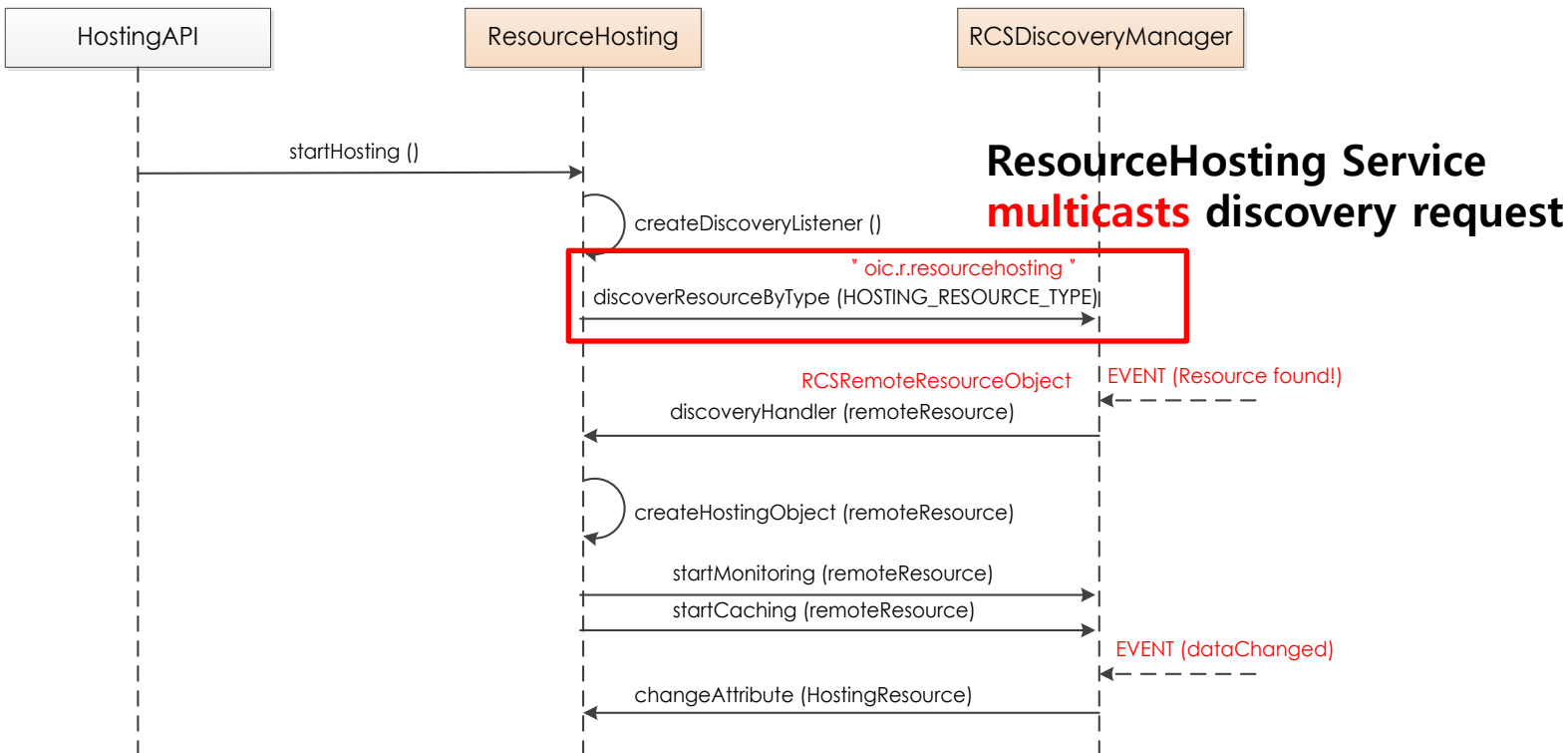
Resource Hosting API

- **OICStartCoordinate ()**
  - Execute ResourceHosting Service
  - Discover the RemoteResource of which the type is "oic.r.resourcehosting" and generates the hosting thread

- **OICStopCoordinate ()**
  - Release the caching and observation information and terminate the ResourceHosting therad

Discovery: OICStartCoordinate()

OICStartCoordinate()

HostingAPI   **ResourceHosting**   **RCSDiscoveryManager**

startHosting ()

createDiscoveryListener ()

" oic.r.resourcehosting "
discoverResourceByType (HOSTING_RESOURCE_TYPE)

ResourceHosting Service multicasts discovery request

RCSRemoteResourceObject   EVENT (Resource found!)
discoveryHandler (remoteResource)

createHostingObject (remoteResource)

startMonitoring (remoteResource)

startCaching (remoteResource)
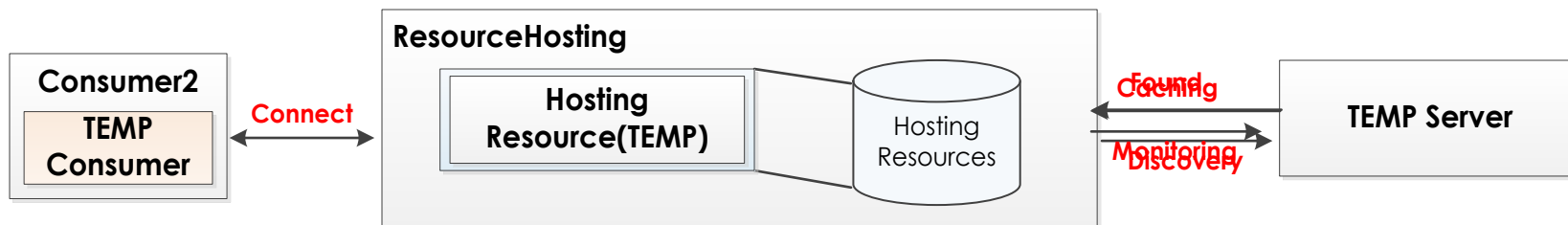
EVENT (dataChanged)

changeAttribute (HostingResource)

Sample Resource Hosting

- **Source: iotivity/service/resource-hosting**
- **Sample consists of 3 applications**
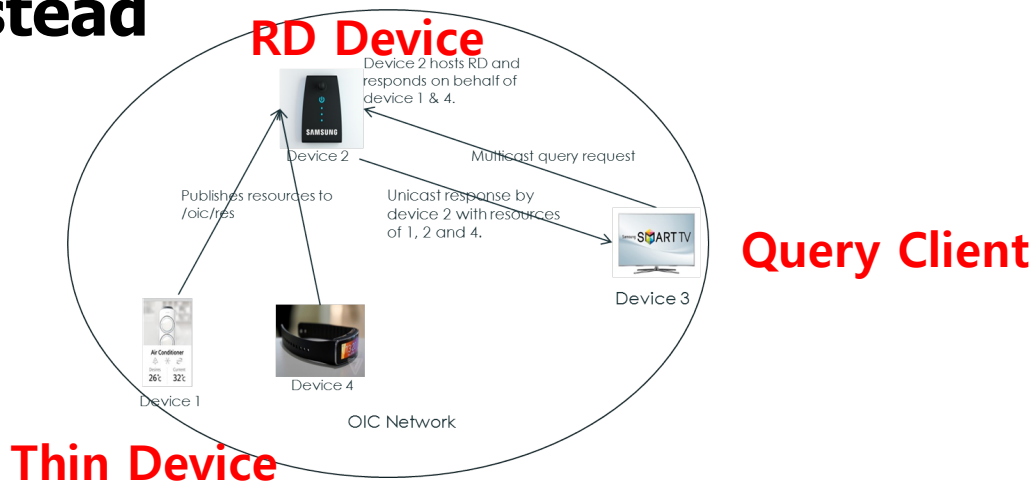 - Sample Consumer, Sample ResourceHosting, Sample Provider

Resource Directory

- **Similar concept, but developed from different project thread**

- **Resource Directory processes the request to thin device instead**

RD Device

Device 2 hosts RD and responds on behalf of device 1 & 4.

Device 2

Multicast query request

Publishes resources to /oic/res

Unicast response by device 2 with resources of 1, 2 and 4.

Query Client

Device 3

Device 1

Device 4

OIC Network

Thin Device

Topology

- ## **Resource Hosting (Mirrored Server)**

oc/res/temp1   ≠   oc/res/temp1/hosting

Consumer2 — TEMP Consumer — Subscribe → ResourceHosting — Discover Register → TEMP Server

oc/res/temp1

- ## **Resource Directory (Cached Server)**

oc/res/temp1 (cached)   =   oc/res/temp1

Consumer2 — TEMP Consumer — Subscribe → ResourceDirectory — Discover Publish ← TEMP Server
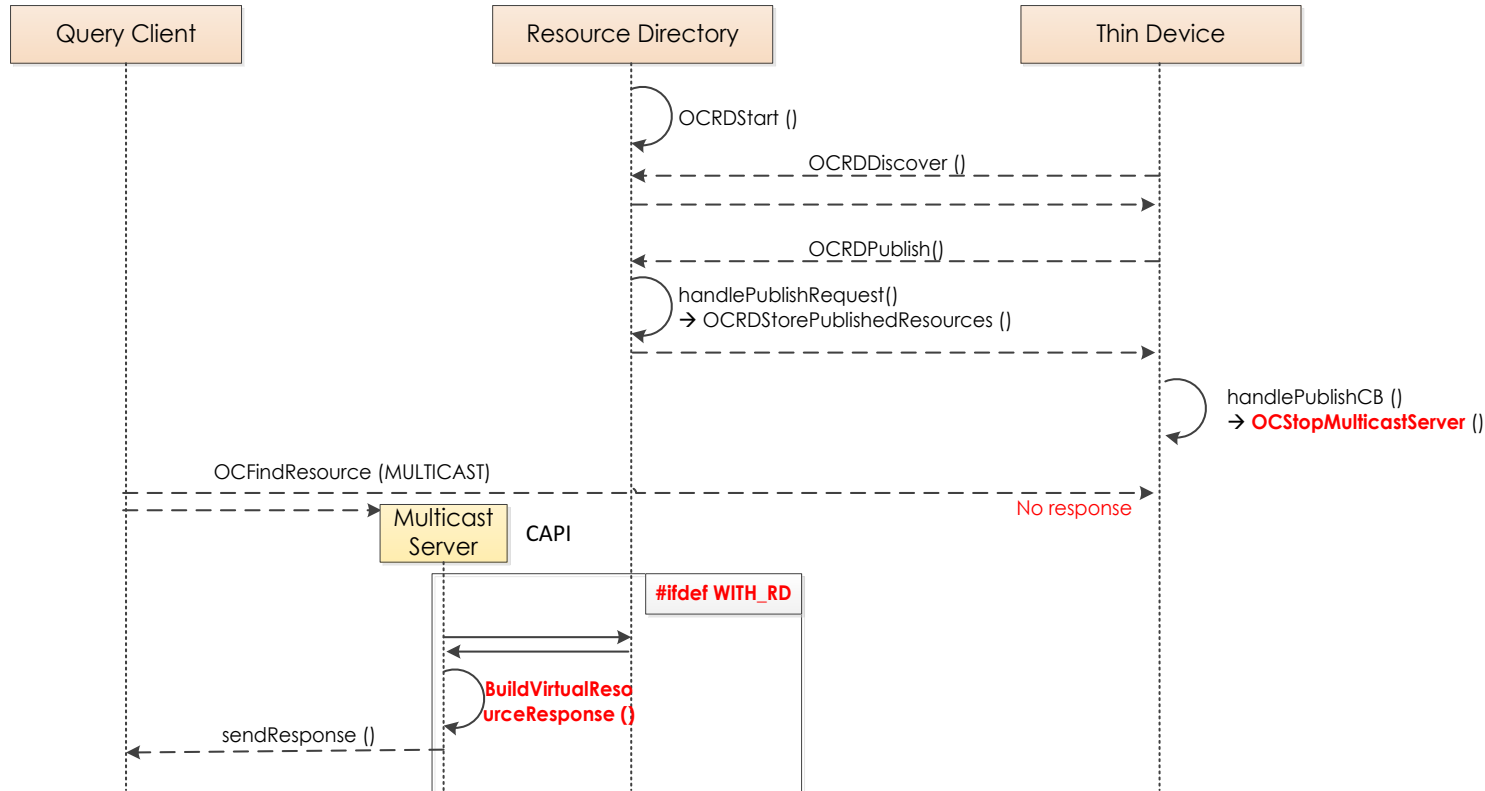
oc/res/temp1

Resource Directory API

- **iotivity/service/resource-directory/**
- **Client API (Publisher / Thin Device)**
  - OCRDDiscover ()
  - OCRDPublish ()
- **Server API (Resource Directory Server)**
  - OCRDStart ()
  - OCRDStop ()

Resource Directory Flow

Sample Resource Directory

- **Source: iotivity/service/resource-directory/samples**
- **Sample consists of 3 applications**
  - rd_main / rd_publishingClient / rd_queryClient