Intent-Based Networking systems and MEC

IRTF NMRG
Interim Meeting

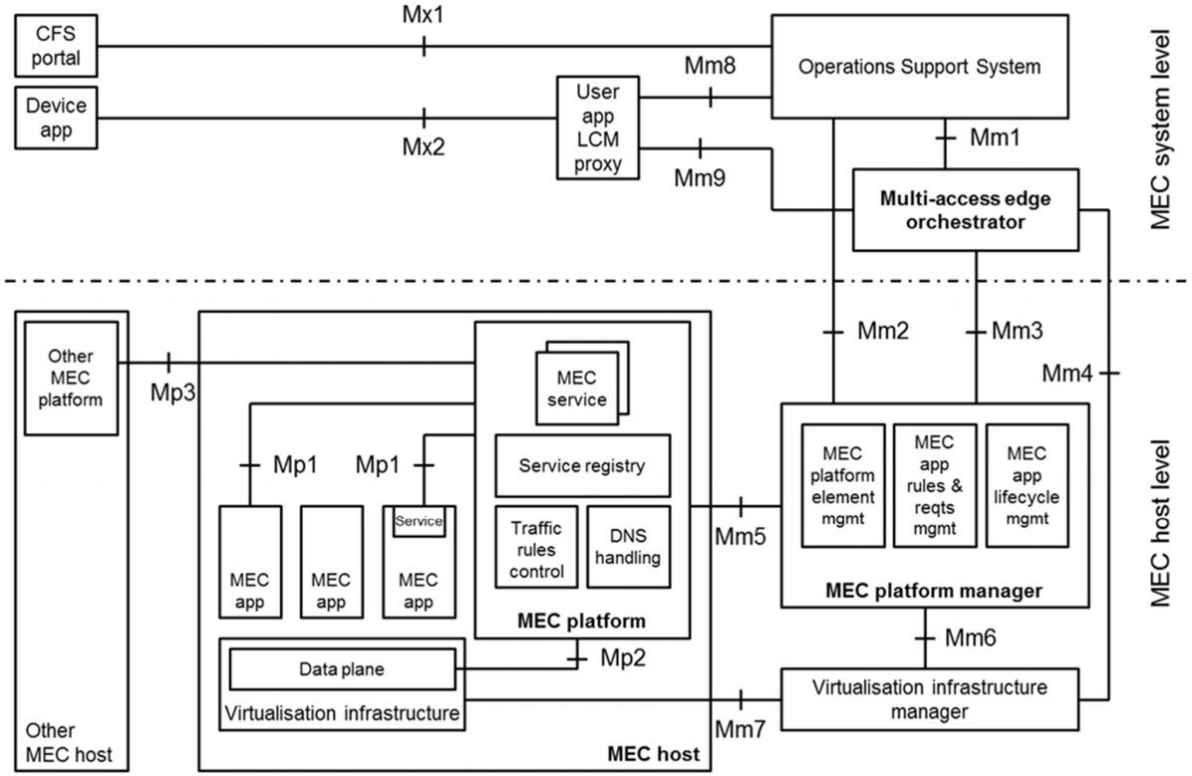
Davide Borsatti, Walter Cerroni (Univ. of Bologna, IT)

ETSI Multi-access Edge Computing

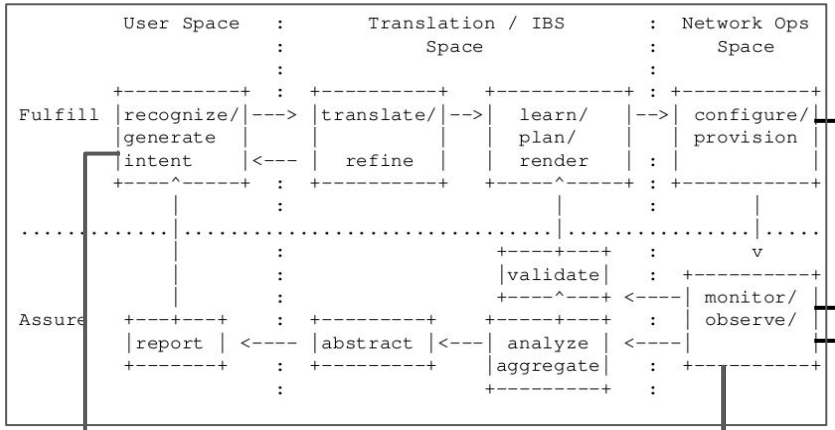
Multi-access Edge Computing (MEC) offers application developers and content providers cloud-computing capabilities and an IT service environment at the edge of the network. This environment is characterized by ultra-low latency and high bandwidth as well as real-time access to radio network information that can be leveraged by applications.

MEC provides a new ecosystem and value chain. Operators can open their Radio Access Network (RAN) edge to authorized third-parties, allowing them to flexibly and rapidly deploy innovative applications and services towards mobile subscribers, enterprises and vertical segments.

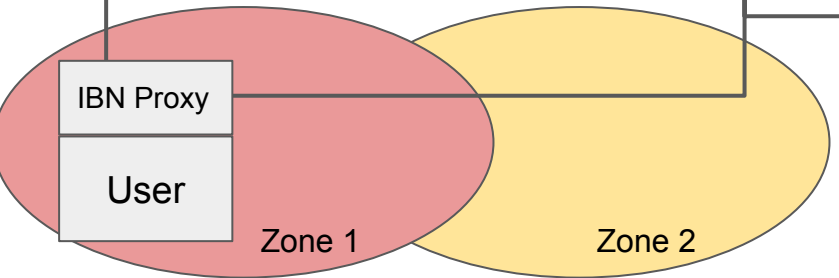
ETSI Multi-access Edge Computing

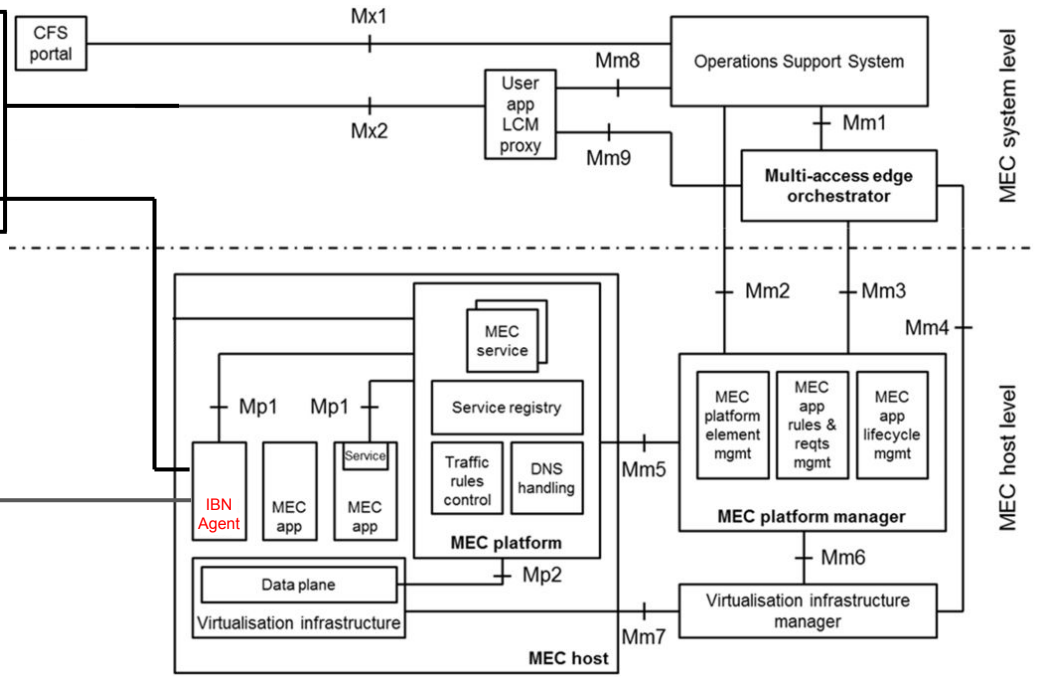


System Design



Device Application / IBN System





System Design

An IBN agent is deployed in the MEC host to consume the services exposed by the MEC Platform over the ***mp1*** interface (e.g., Radio Network Information Service, Location Service). This data could be used to assist the IBN Monitor Block. For example it could track down the position of the intent-requesting user and alert the IBN system whenever the required MEC application should be moved (e.g., from Zone 1 to Zone 2).
Furthermore it could execute all the health-checking functions on the MEC application (GET ***/services/{appInstanceId}*** -> extract contact point -> Health check).

IBN and MEC integration

IBN component communicates with the MEC system level through the Mx2 interface toward the “User app LCM proxy”, using MEC 016 standardized API. Specifically:

GET /app_list -> To monitor existing applications (Monitor/Observe IBN block)

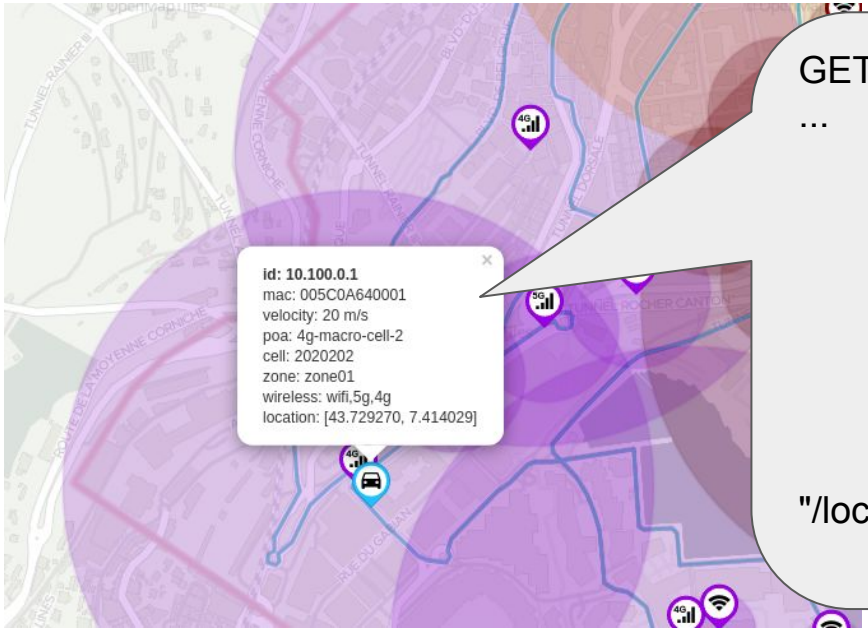
POST /obtain_app_loc_availability -> To request an available location (MEC host) to deploy the desired MEC application (Configure/Provision IBN block)

POST /app_contexts -> To launch a new MEC application (Configure/Provision IBN block). It replies with the address(es) (reference URIs) provided for clients that are external to the MEC system to interact with the user application (Monitor/Observe IBN block for app Health-Check)

PUT /app_contexts -> To update the location constraints of an existing MEC application (Monitor/Observe -> Configure/Provision IBN blocks)

DELETE /app_contexts -> To stop an existing MEC application (Configure/Provision IBN block)

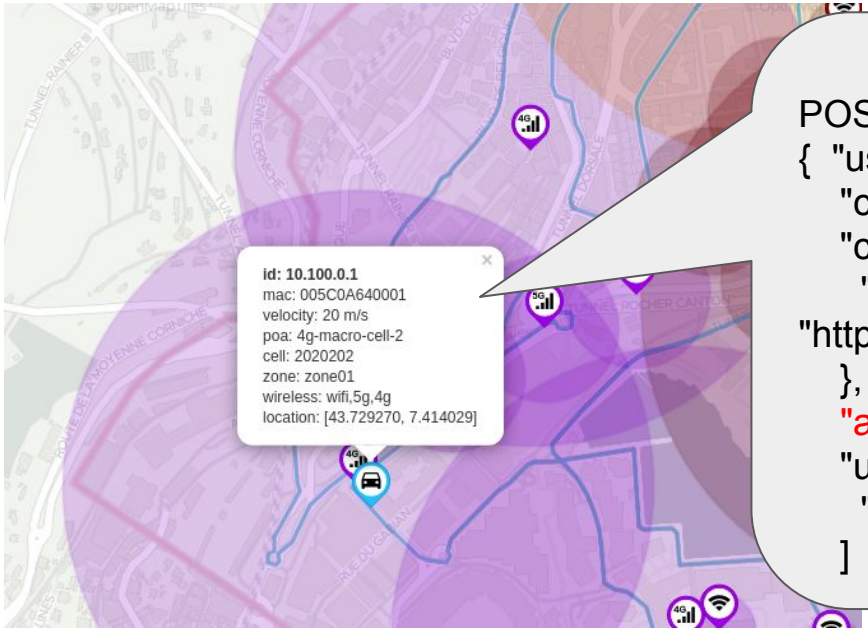
MEC 013 - Location API - Get Users location



GET /queries/users :

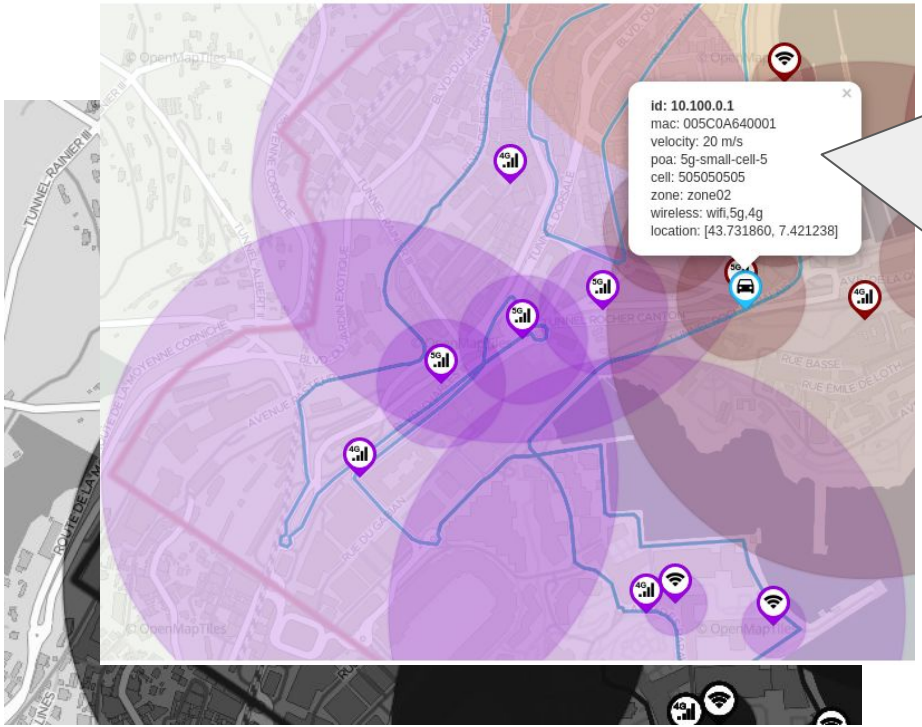
```
...    "user": [ {
        "accessPointId": "4g-macro-cell-2",
        "address": "10.100.0.1",
        "locationInfo": {
          "latitude": [ 43.72946 ],
          "longitude": [ 7.413239 ],
          "shape": 2,
          "timestamp": { ... } },
        "resourceURL":
"/location/v2/queries/users?address=10.100.0.1",
        "zoneId": "zone01"   }   ] ...
```

MEC 013 - Location API - Tracking Users movement




```
POST /subscriptions/userTracking
{  "userTrackingSubscription": {
    "clientCorrelator": "0123",
    "callbackReference": {
      "notifyURL":
"http://my.callback.com/location-user-tracking/some-id"
    },
    "address": "10.100.0.1",
    "userEventCriteria": [
      "Entering"
    ] } }
```

MEC 013 - Location API - Tracking Users movement

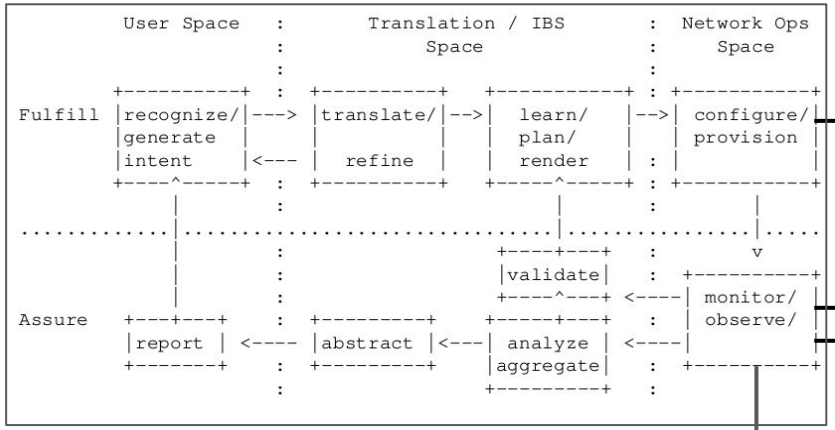


When the user enters a new zone, the MEP notifies the subscribed user

```
{  "zonalPresenceNotification": {
    "address": "10.100.0.1",
    "callbackData": "0123",
    "currentAccessPointId": "4g-macro-cell-4",
    "timestamp": {
      "nanoSeconds": 0,
      "seconds": 1613171308
    },
    "userEventType": "Entering",
    "zoneId": "zone02" } }
```

Example taken from [ETSI MEC Sandbox]

System Design



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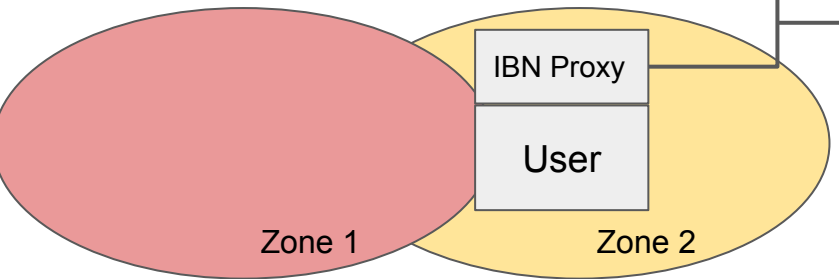

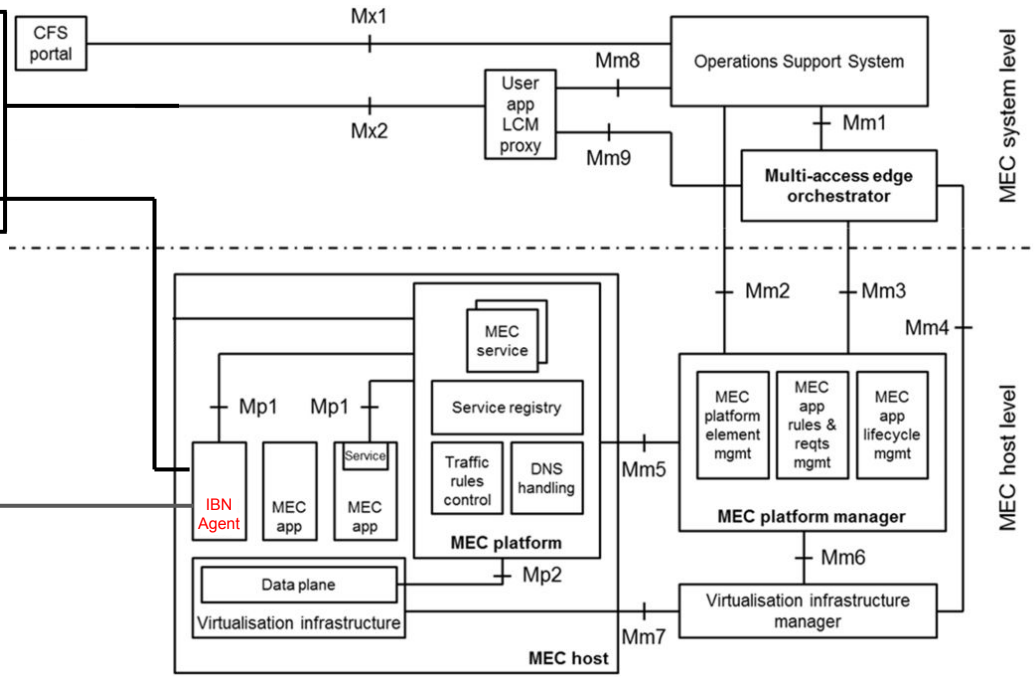

Contact points

- Davide Borsatti (davide.borsatti@unibo.it)
- Walter Cerroni (walter.cerroni@unibo.it)