oneM2M API Part1

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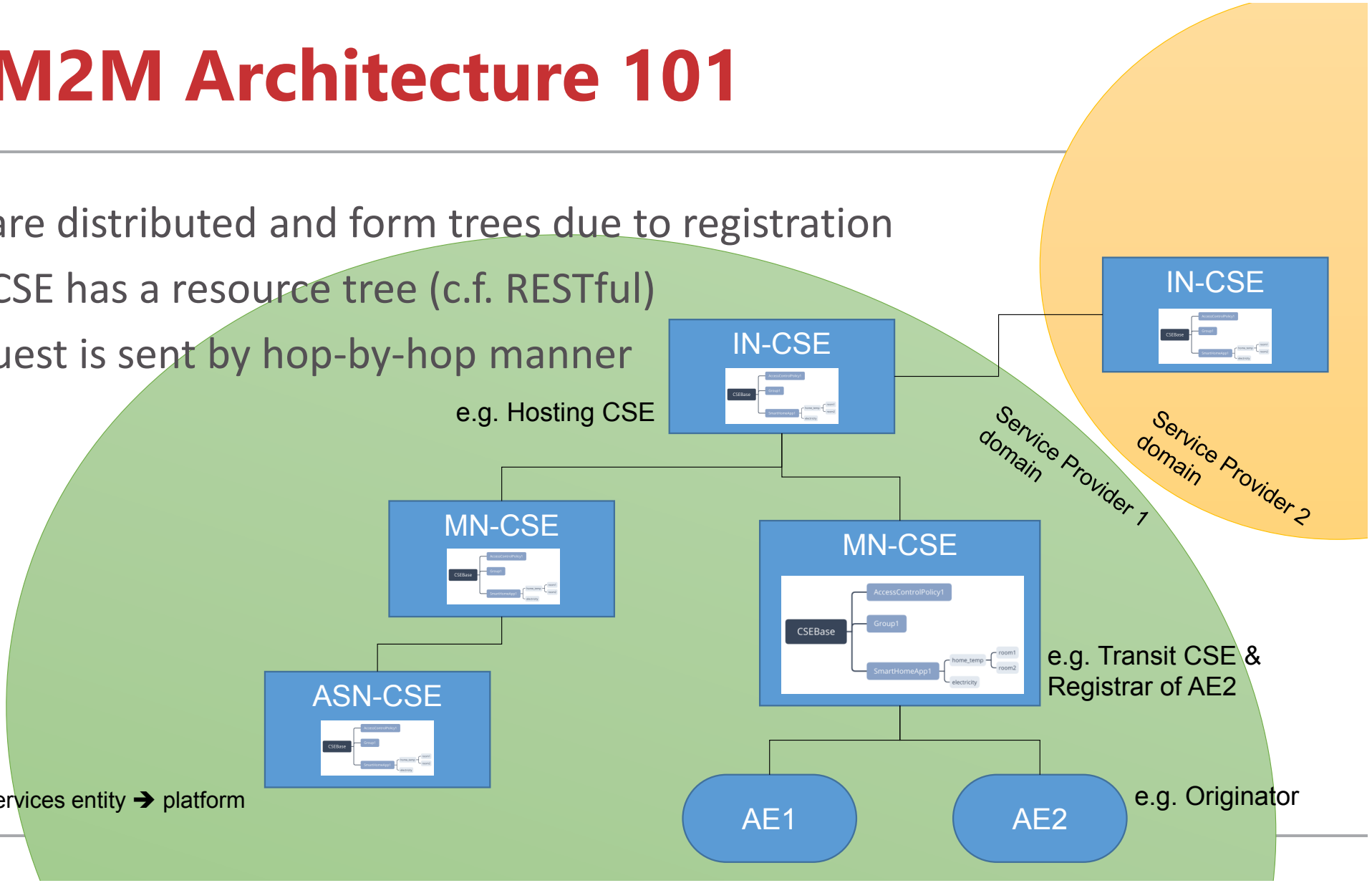
Outline

- oneM2M Architecture 101
- CSFs and Core APIs
- Good to Know APIs

oneM2M Architecture 101

- CSEs are distributed and form trees due to registration
- Each CSE has a resource tree (c.f. RESTful)
- A request is sent by hop-by-hop manner

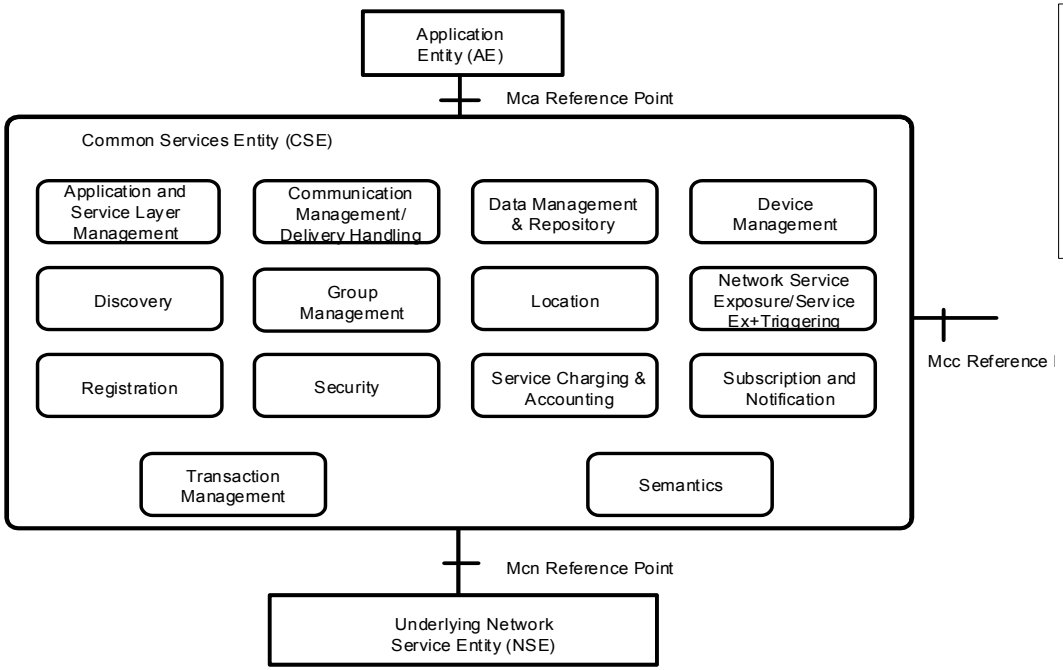


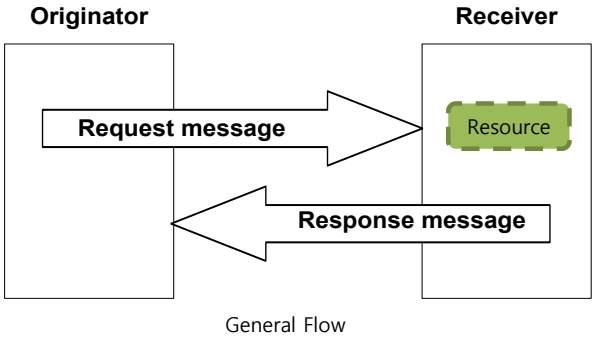
CSE: common services entity ➔ platform

CSFs and Core APIs

CSFs and Core APIs

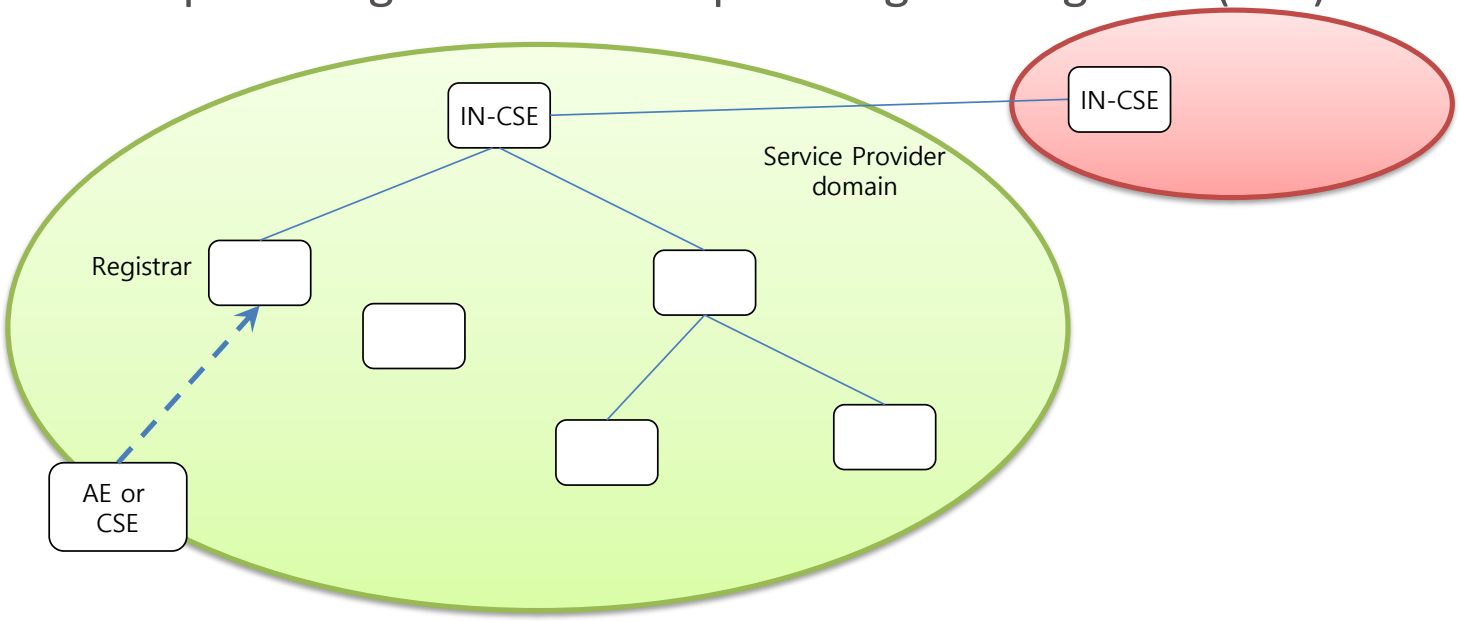
- Conceptual Functional Blocks
  - Grouping of oneM2M middleware functionalities/APIs
    - Exposed to Apps, other oneM2M platforms





CSFs and Core APIs

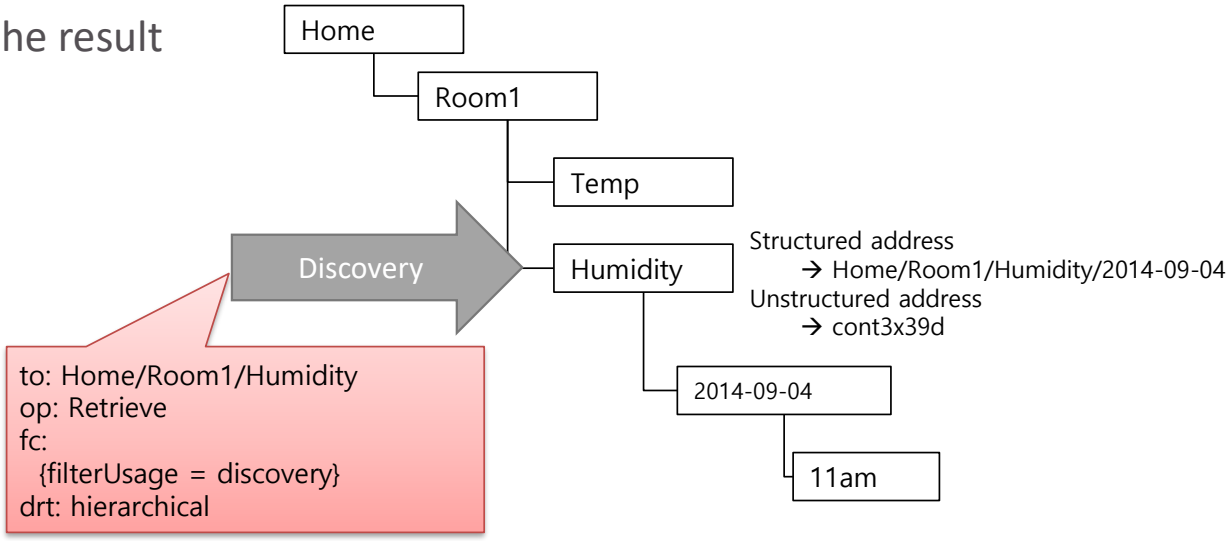
- Registration
  - is a prerequisite condition to use the oneM2M system that confirms an entity identifier with authentication check
  - A Registree requests registration to its pre-assigned Registrar (CSE)



CSFs and Core APIs

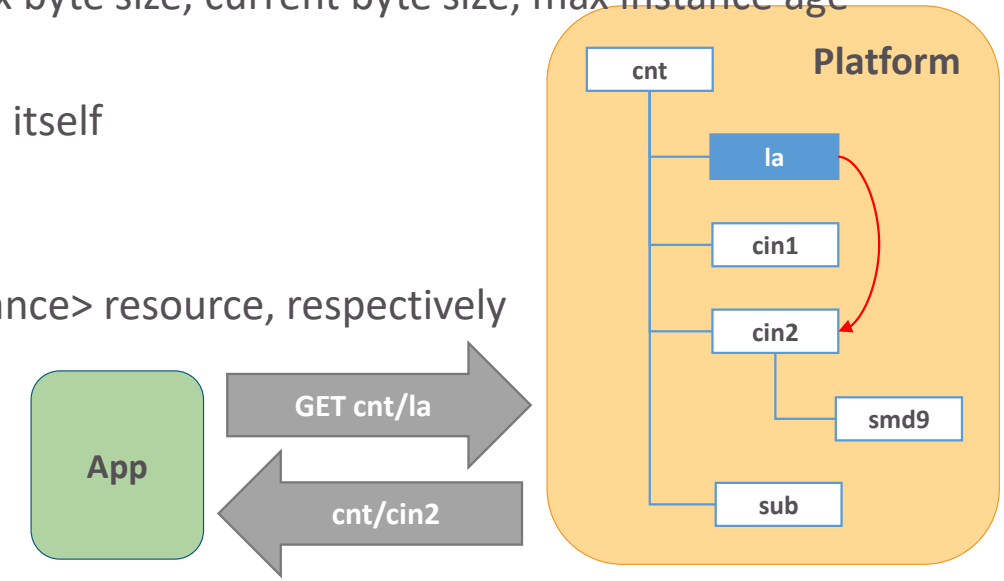
- Discovery
  - Discovery Result Type Parameter

    Indicates whether the result contains structured or unstructured addresses
  - Scope of Discovery
    - Sub(child/descendent)-resources of the target resource
    - Target resource is not included in the result



CSFs and Core APIs

- Data Management – container and contentInstance
  - container contains sub-containers to represent data hierarchy
  - container contains data, which are content instances
    - has meta data of all instances in it
    - max # of instances, current # of instances, max byte size, current byte size, max instance age
  - contentInstance
    - has meta data of each instance as well as data itself
    - media type, encoding, size, creator
  - latest and oldest
    - are pointers to latest and oldest <contentInstance> resource, respectively
  - Relevant APIs
    - <container> resource: CRUD
    - <contentInstance> resource: CRD
    - <latest>, <oldest> resource: RD



CSFs and Core APIs

- Data Management – flexContainer
  - is variant of <container>, <contentInstance> resource
  - is a customizable container that may have custom attributes
    - so that there are some flexContainer specializations
    - Content vs. [custom attributes]
  - is a container and also a data instance
  - Relevant APIs
    - <flexContainer> resource: CRUD

cin1

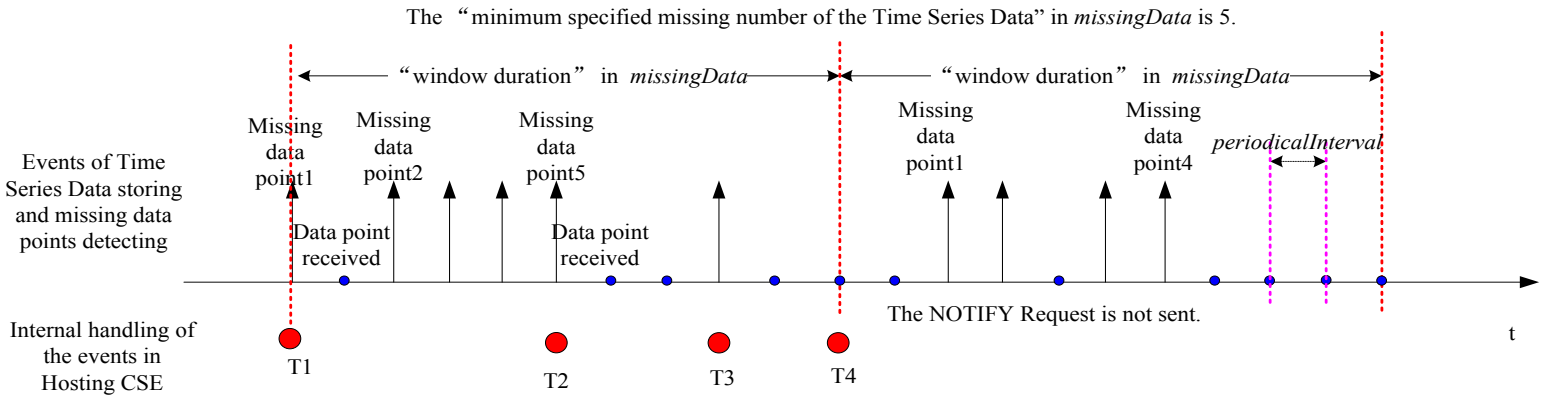
- Content = {Width = 5,
  Height = 4,
  Depth = 3

myFlex1

- Width = 5
- Height = 4
- Depth = 3

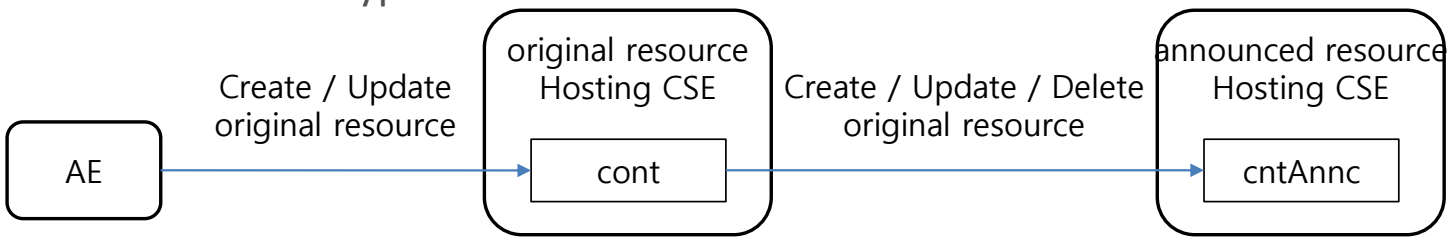
CSFs and Core APIs

- Data Management – timeSeries and timeSeriesInstance
  - are variant of <container>, <contentInstance> resource
  - are recording/handling data generation time, not the stored time
    - dataGenerationTime vs. creationTime
  - Relevant APIs
    - <timeSeries> resource: CRUD



CSFs and Core APIs

- Data Management – Announcement
  - Announcement in oneM2M is creating a partial copy of an original resource to a remote CSE
    - Apps can choose attributes to be announced
    - An announced resource has a link to the original one
  - Announcement can ease resource discovery
  - Announced resource cannot be created directly by apps, apps request CSEs to Create/Update/Delete that resource
  - Relevant API
    - <announcableResourceType> resource: CU

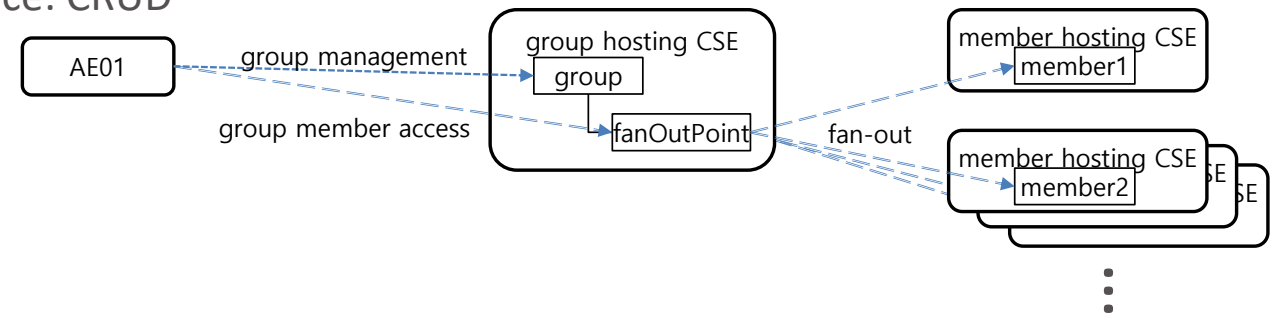


CSFs and Core APIs

- Authorization – Different Mechanisms
  - Access Control Policy
    - Basic mechanism supported in Rel-1 as well as the other releases
    - <accessControlPolicy> resource and accessControlPolicyIDs attribute
  - Dynamic Authorization Consultation
    - <dynamicAuthorizationConsultation> resource and dynamicAuthorizationConsultationIDs attribute
  - Role
    - <role> resource and Role IDs parameter
  - Token
    - <token> resource and Token Request Indicator / Tokens / Token IDs parameters

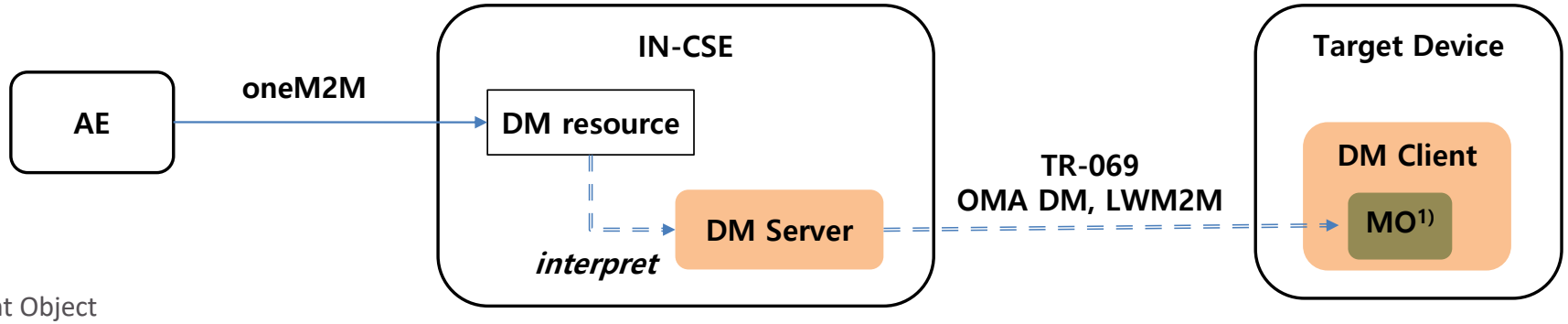
CSFs and Core APIs

- Group – group and fanOutPoint
  - group function consists of
    - group members management
    - request fan-out and response aggregation
  - <group> resource contains
    - a list of members and access control policy links for accessing members, not the group resource
    - fan-out point to receive a request that will be sent to all members
  - Relevant APIs
    - <group>, <fanOutPoint> resource: CRUD



CSFs and Core APIs

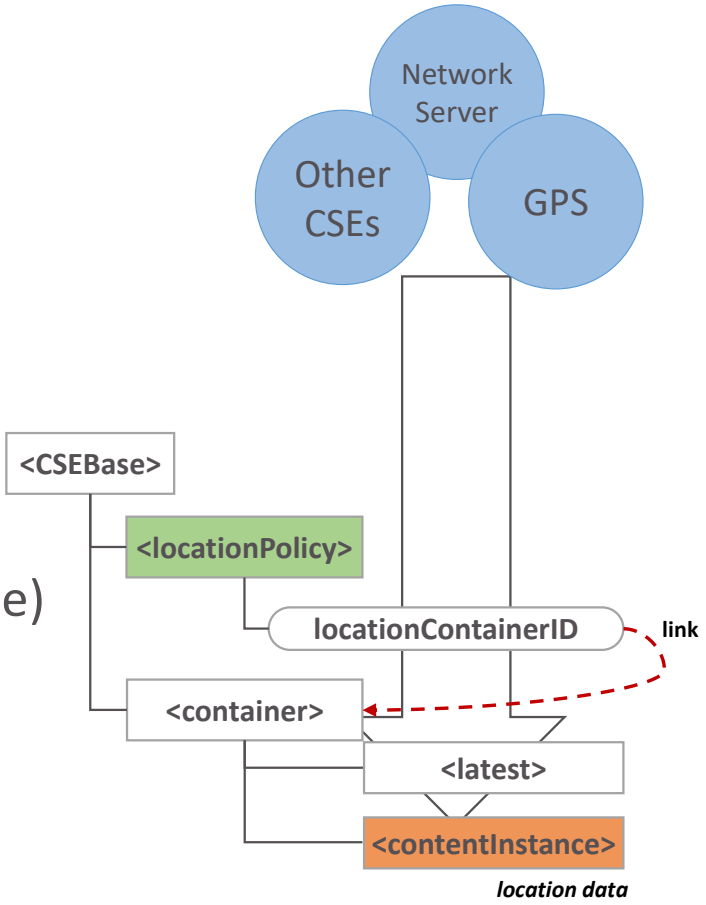
- Device Management (DM) – mgmtObj, mgmtCmd and execInstance
  - oneM2M DM function utilizes external DM protocols
    - BBF TR-069, OMA DM and Lightweight M2M
  - and interprets oneM2M protocol to those
    - resource manipulation triggers DM API call
  - Relevant APIs
    - <mgmtObj>, <mgmtCmd> resource: CRUD
    - <execInstance> resource: RUD



1) Management Object

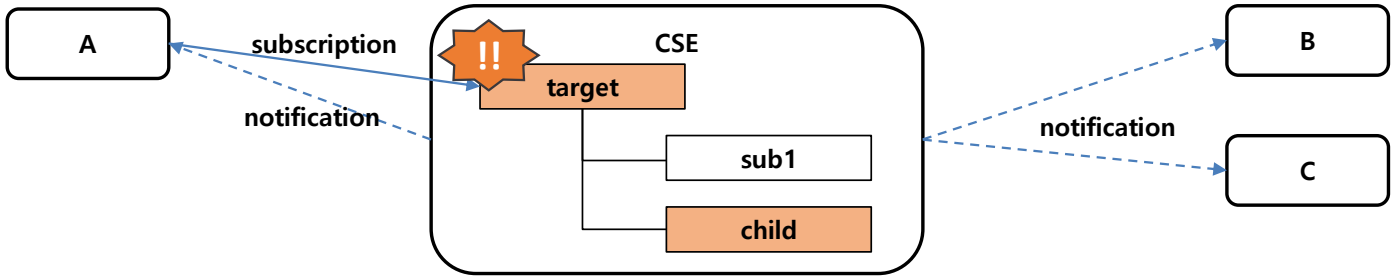
CSFs and Core APIs

- Location – locationPolicy
  - CSE provides the entity location with the following mechanisms
    - Device-based (e.g. GPS)
    - Network-based (e.g. operator's location server)
    - Sharing-based
  - a location policy stores configuration to get location information
    - Update period, target ID, location server, target area, etc.
  - when a policy is set, data container(<container> resource) is created and they're linked each other
  - then a CSE puts location info. as <contentInstance> resource and apps get them
  - Relevant APIs
    - <locationPolicy> resource: CRUD



CSFs and Core APIs

- Subscription/Notification
  - <subscription> resource represents configurations for event definition and notification message/transmission
  - Not all resource types are subscribe-able
  - Event monitoring target is subscribed-to resource and its children and events can be filtered
  - Notification target can be multiple and can be different from a resource subscriber
  - Relevant APIs
    - <subscription> resource: CRUD



Good to Know APIs

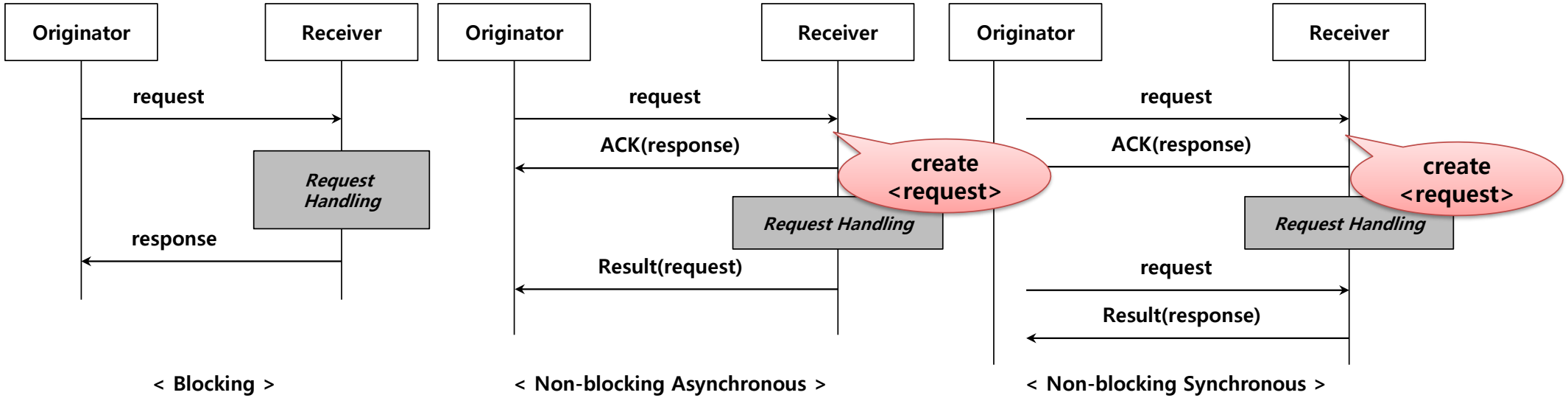
Good to Know APIs

- Data Management – Result Content parameter
  - Indicates which type of data will be contained in the Content parameter of the response
    - E.g. don't need a resource after the successful creation
    - E.g. need hierarchical (structured) resource address in create response
    - E.g. need container + its children contentInstance resources with one retrieval request
    - E.g. need all subscription children resources of a target one retrieval request

Value	Create	Retrieve	Update	Delete	Notify
attributes	default	default	default	valid	n/a
modified-attributes	valid	n/a	valid	n/a	n/a
hierarchical-address	valid	n/a	n/a	n/a	n/a
hierarchical-address+attributes	valid	n/a	n/a	n/a	n/a
attributes+child-resources	n/a	valid	n/a	valid	n/a
child-resources	n/a	valid	n/a	valid	n/a
attributes+child-resource-references	n/a	valid	n/a	valid	n/a
child-resource-references	n/a	valid	n/a	valid	n/a
nothing	valid	n/a	valid	default	valid
original-resource	n/a	valid	n/a	n/a	n/a
semantic-content	n/a	valid	n/a	n/a	n/a

Good to Know APIs

- Communication Handling – Response Type parameter
  - Originator suggests communication modes
    - Blocking, Non-blocking Synchronous, Non-blocking Asynchronous, Flex-blocking Mode
    - In case of non-blocking, <request> resource is created
    - In case of flex-blocking, the Receiver chooses communication mode



Good to Know APIs

- Communication Handling – pollingChannel and pollingChannelURI
  - Request message polling when an entity cannot get push message
  - Relevant APIs
    - <pollingChannel> resource: CRUD
    - <pollingChannelURI> resource: R + Notify