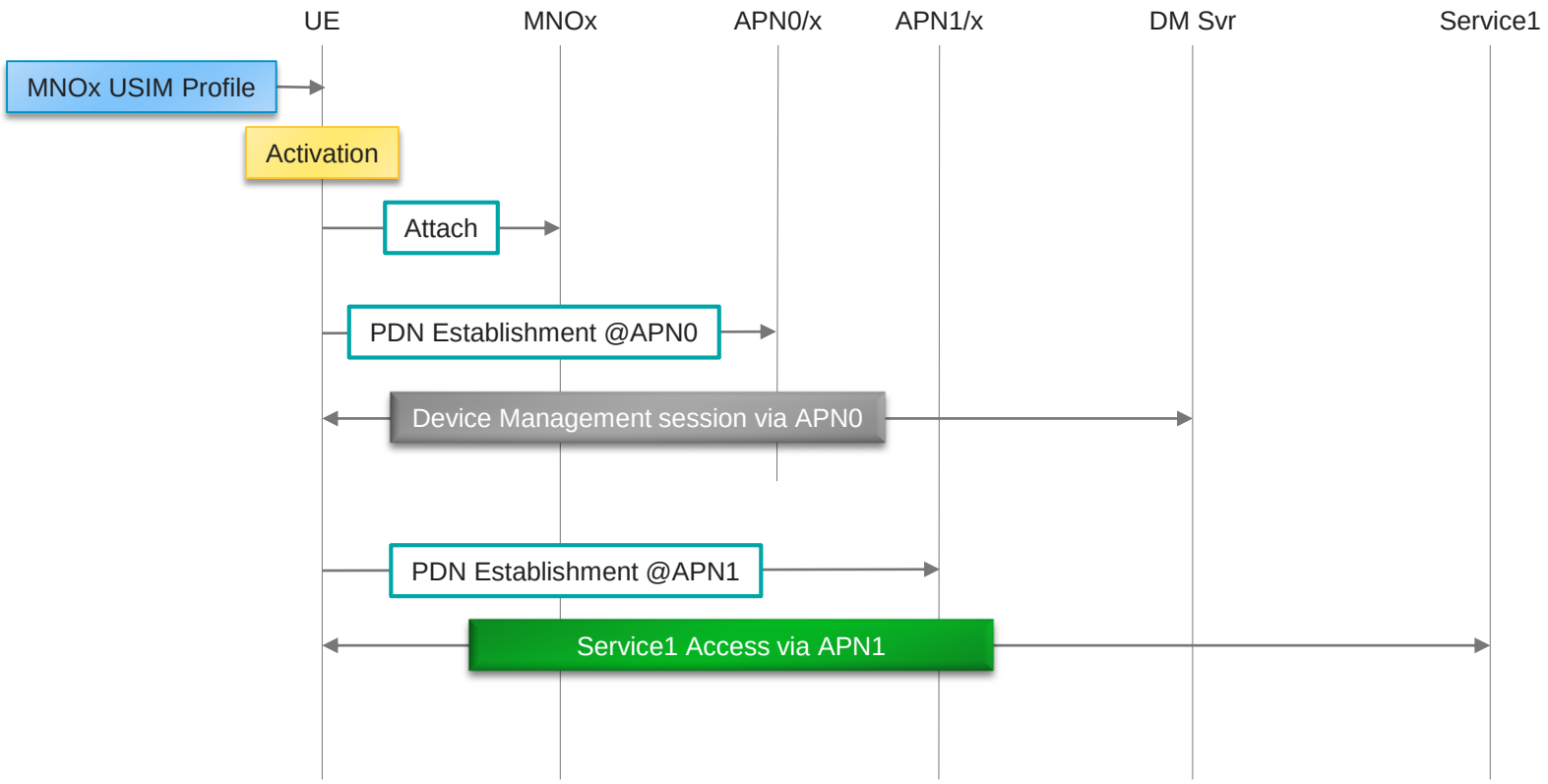
APN provisioning

Ly Thanh PHAN
2018

Constraint device use case

- New resource constraint devices in IoT space need be managed during their life time
- These device subscription are remotely provisioned and managed
- These resource constraint devices will not have pre-configured APNs nor the device management platform address for the activated operator
- The MNO which profile has been activated, will not have a direct relationship with the device manufacturer (e.g. smaller OEMs)
- And the OEM may not be able to manage these devices (activate and forget type devices)
- The activated MNO need be able to manage the device configuration to provide access to services to the end user
- In order to perform the device management, the MNO device management platform address (e.g. FQDN) and APN at which it is accessible need be provisioned in the device.

A typical device to service flow



Requirements for Device Management server at MNOx

- UE needs APN0 at MNOx to connect to the Device Management server of MNOx
- UE needs DM Server address of MNOx
- UE needs APN1 at MNOx to access service1

Different provisioning solutions of the APNs

Device pre-provisioned with MNO profile (i.e. DM address, APN per application/service)	Requires pre-configured information on a per potential PLMN basis
Via a DM platform	DM platform address & credentials & an APN shall be pre-configured
Default APN (MME/AMF)	Only 1 APN. Requires DM platform address be pre-configured & support by UE/MME/AMF
(e)PCO (UE←→SMF/PGW)	Requires support by UE/SMF/PGW & PCF be configured with DM Server Address and APNs per application/service
Generic UE configuration update procedure (UE←→MME/AMF)	Requires support by UE/MME/AMF & HSS/UDM be configured with DM Server Address and APNs per application/service
APNs and DM platform address in USIM Profile	Requires ME support and USIM profile support

APNs and DM Platform address in USIM minimize the efforts

- Advantages of preconfigured APNs and DM platform address in the USIM profile:
  - More flexibility for the MNO
  - Minimize the memory impact in the UE and operational complexity
  - Minimize impacts on other elements of the network
  - Easier deployment for new resource constraint IoT devices

- Drawbacks:
  - Development on the ME, which effort and complexity are equivalent to what is needed in the other solutions