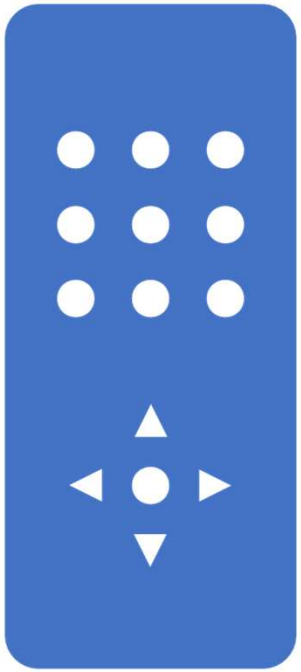
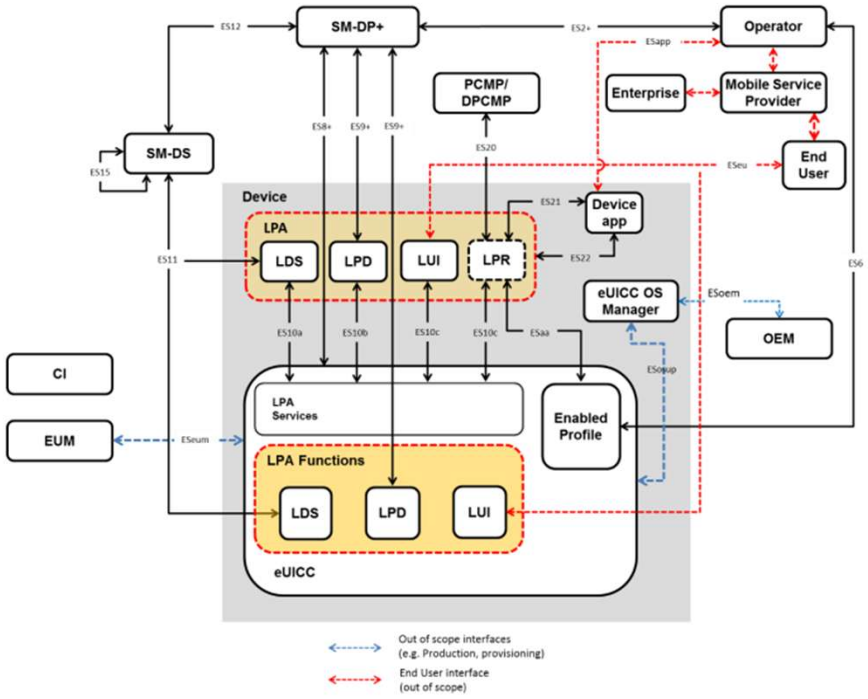


e-SIM, eUICC, & Remote Provisioning

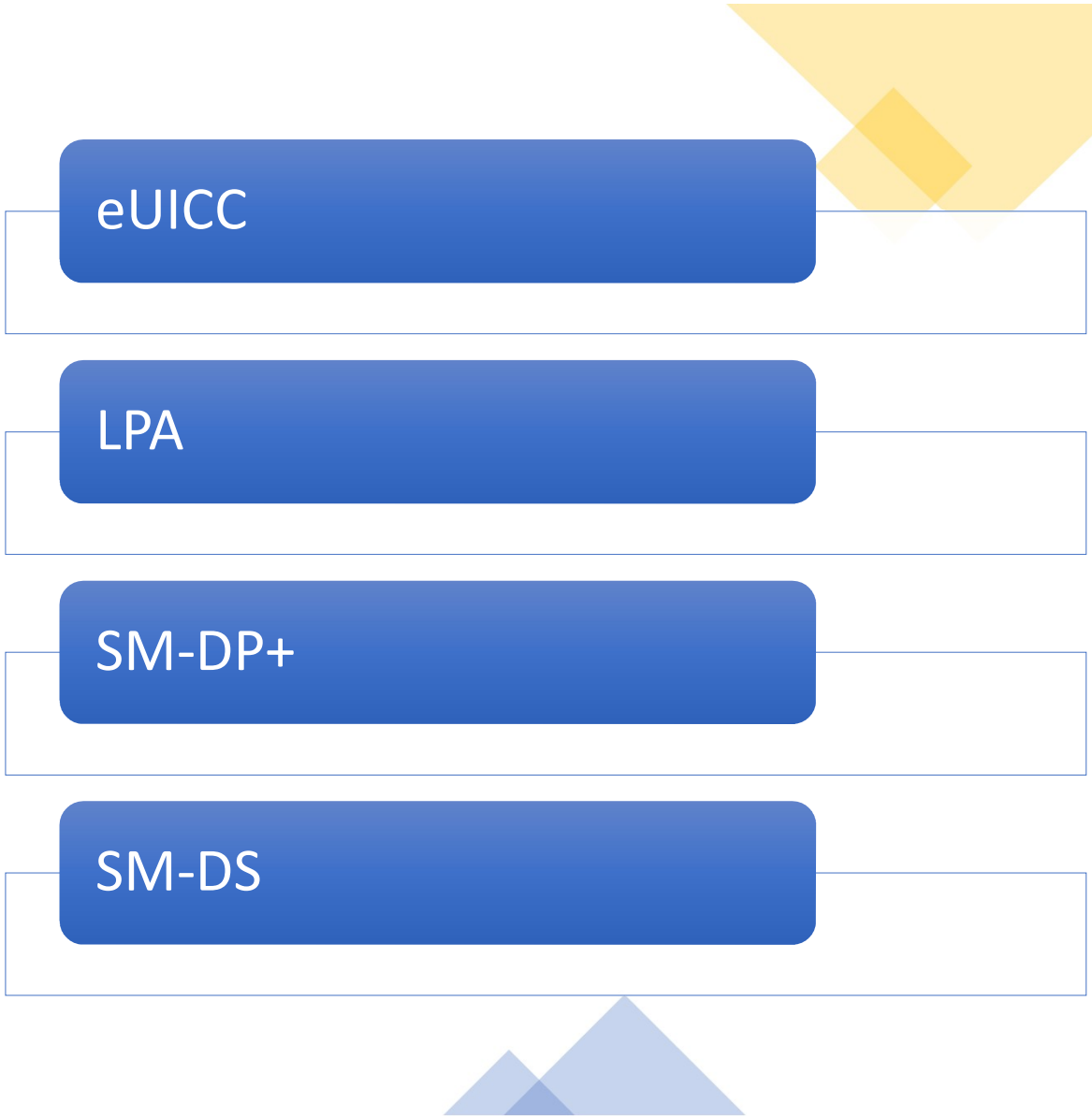
Remote SIM Architecture

Driving Forces for e-SIM

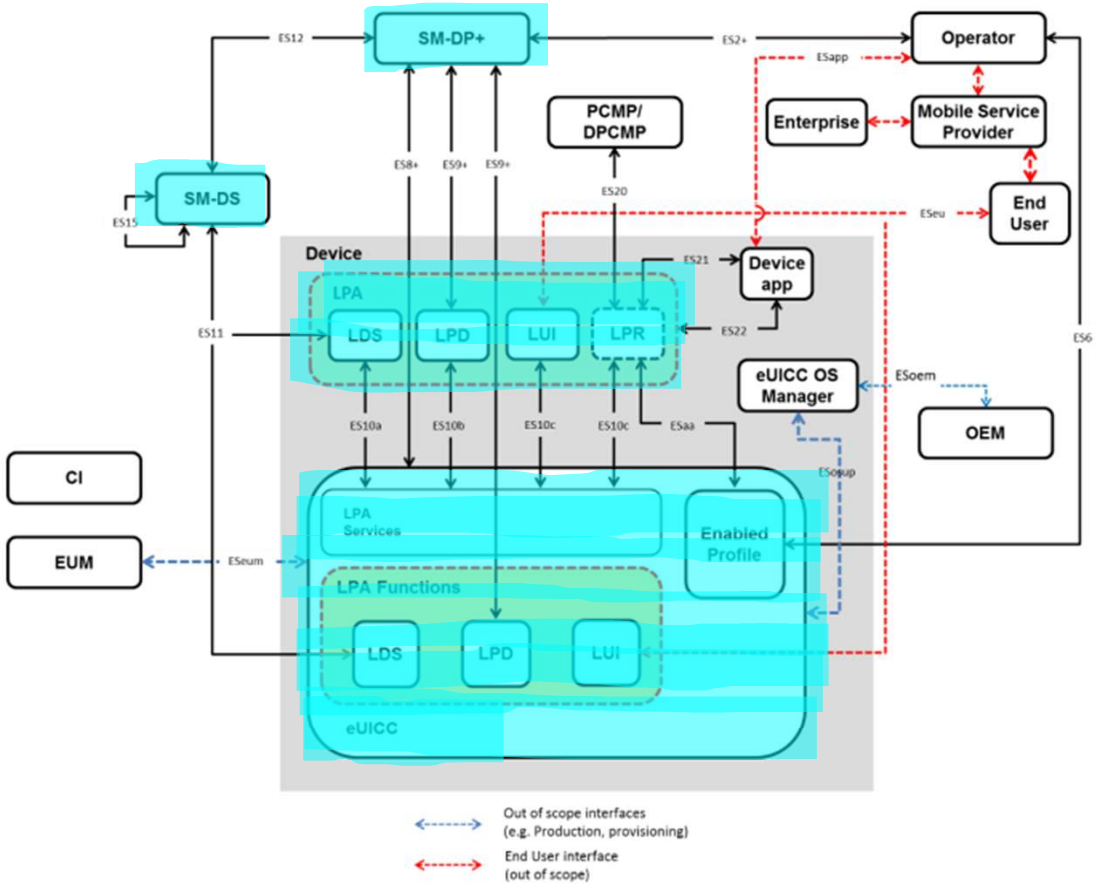
Remote SIM Provisioning System Architecture



SGP.21v3.0


eUICC
LPA
SM-DP+
SM-DS

Remote SIM Provisioning System Architecture



SGP.21v3.0

Remote SIM Provisioning System Architecture

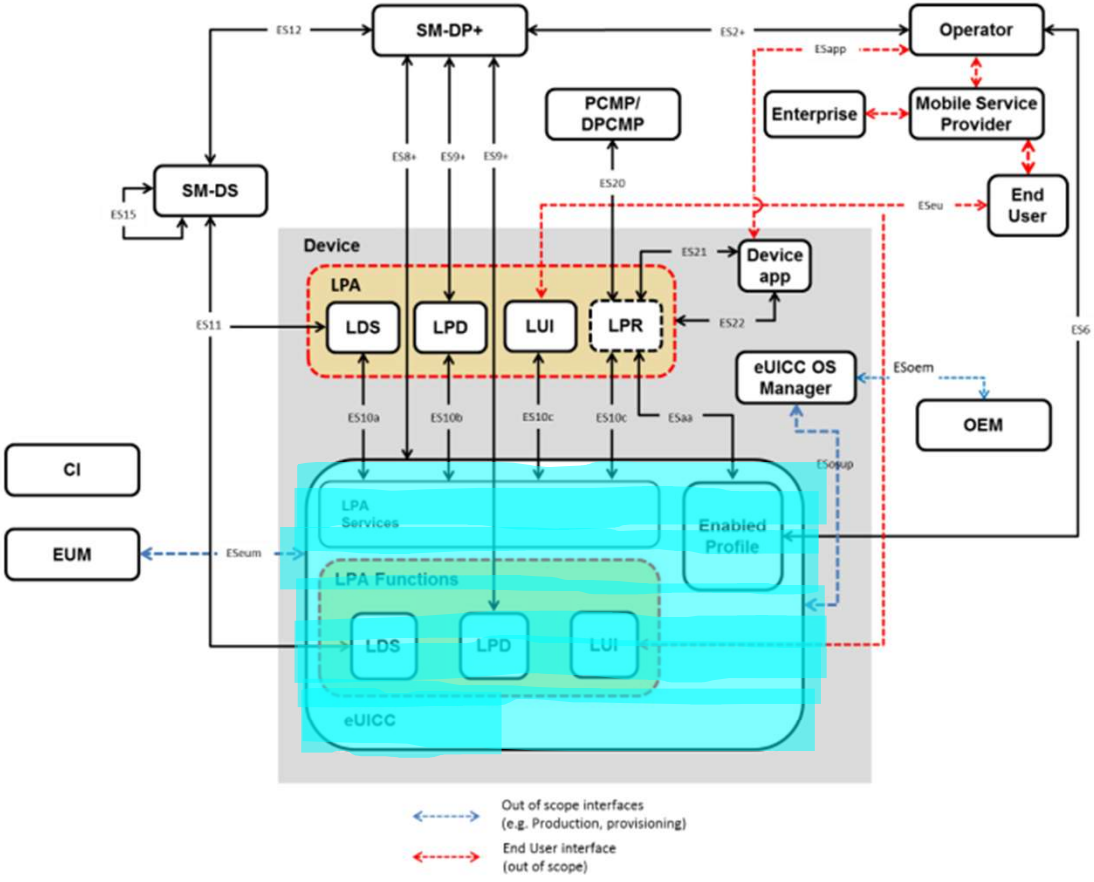
eUICC

LPA

SM-DP+

SM-DS

Remote SIM Provisioning System Architecture

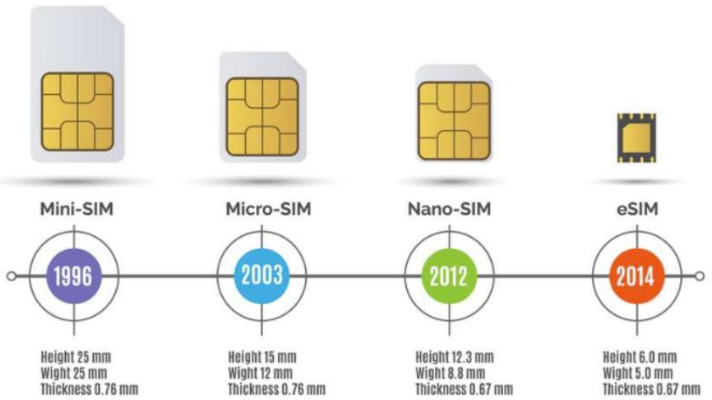


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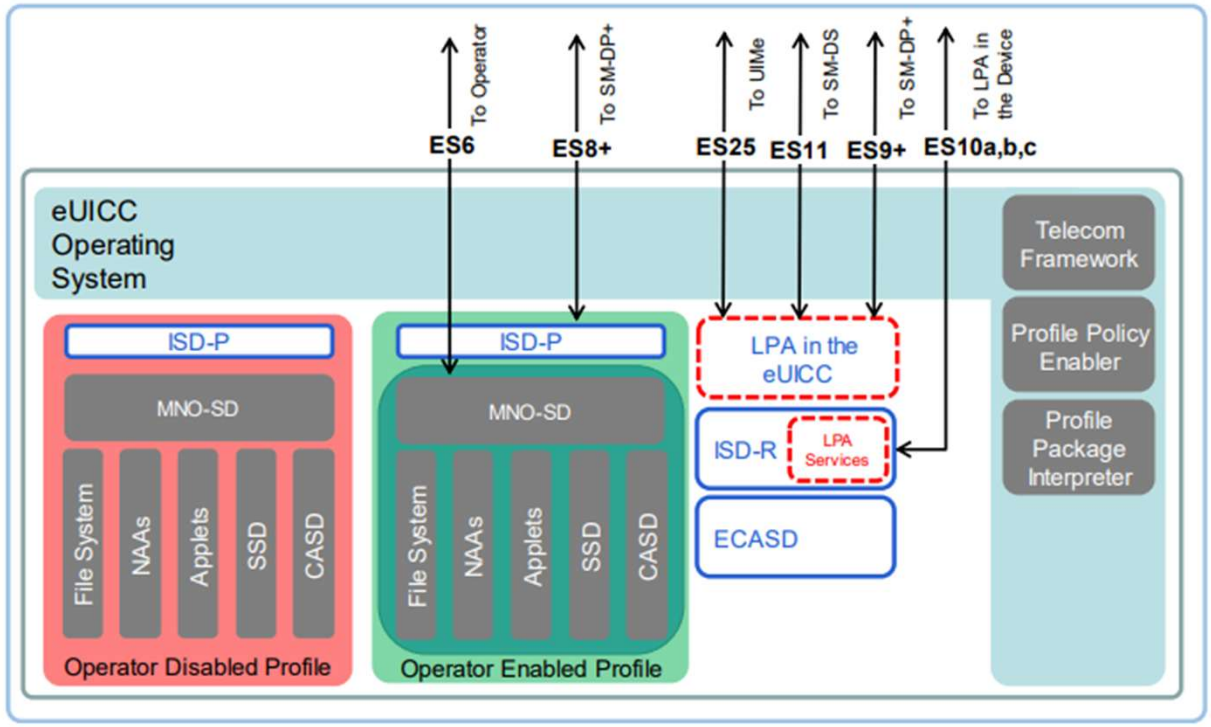
eUICC vs e-SIM

- e-SIM is the virtual SIM card

- eUICC is what allows devices to use e-SIMs. It stores SIM profiles and they profiles are what enable traditional SIM functions



eUICC Architecture



SGP.21v3.0

Remote SIM Provisioning System Architecture

~~eUICC~~

LPA

SM-DP+

SM-DS

Local Profile Assistant (LPA)
LPAe
LPAd

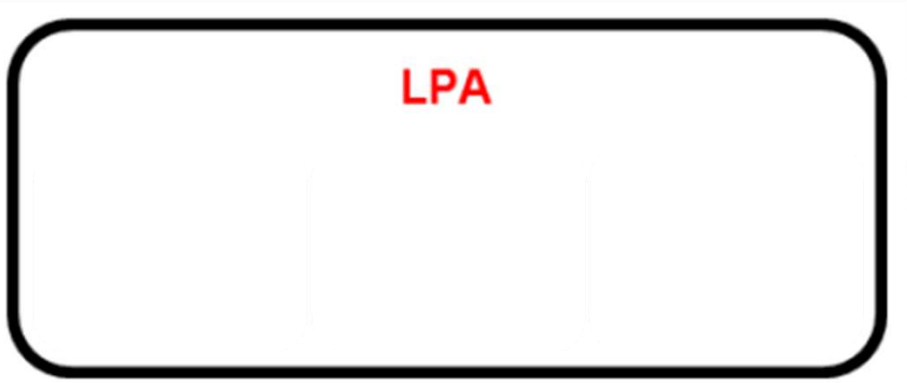


Figure 7: LPA Functions

Function name	Description
Local Discovery Service (LDS)	Where required, the LDS is responsible for retrieving pending Event Records from the SM-DS.
Local Profile Download (LPD)	This plays a proxy role for the efficient download of a Bound Profile Package in two stages: (i) the download of a Bound Profile Package from the SM-DP+ to the LPD in a single transaction, and (ii) the onward transfer of the Bound Profile Package into the eUICC in segments. This function will depend on network, Device, and eUICC capabilities.
Local User Interface (LUI)	This function allows the End User to perform Local Profile Management on the Device. User Intent SHALL be enforced.

Table 26: LPA Function Descriptions

SGP.21v3.0

Local Profile Assistant (LPA)
LPAe
LPAd

4.11.2.1 LPA in the eUICC

LPA functions are provided by the eUICC.

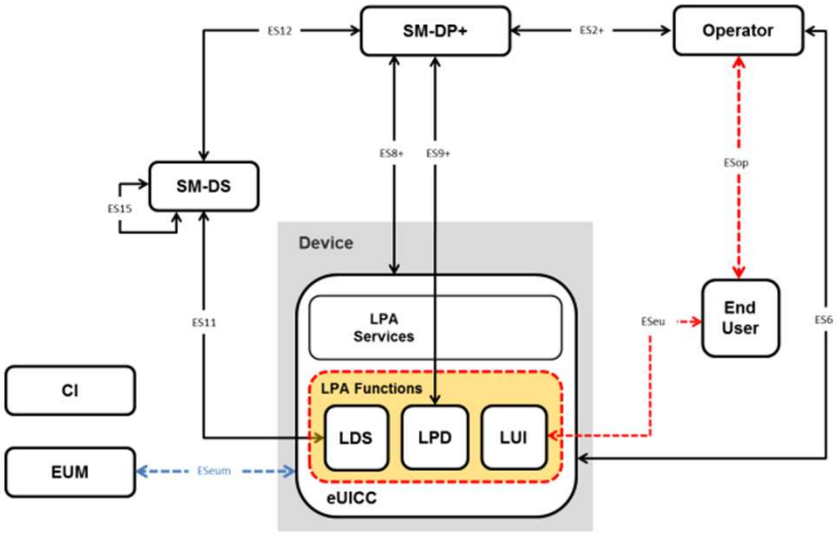


Figure 8: LPA in the eUICC

4.11.2.2 LPA in the Device

LPA functions are provided by the Device.

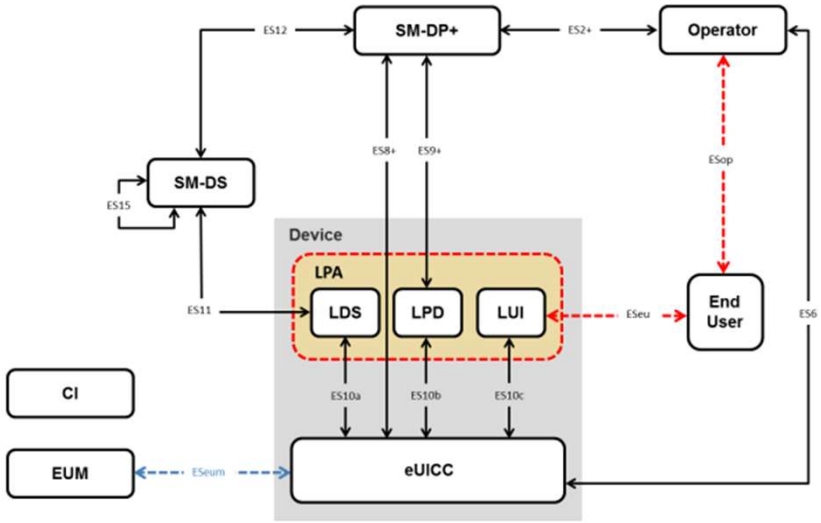


Figure 9: LPA in the Device

SGP.21v3.0

Remote SIM Provisioning System Architecture

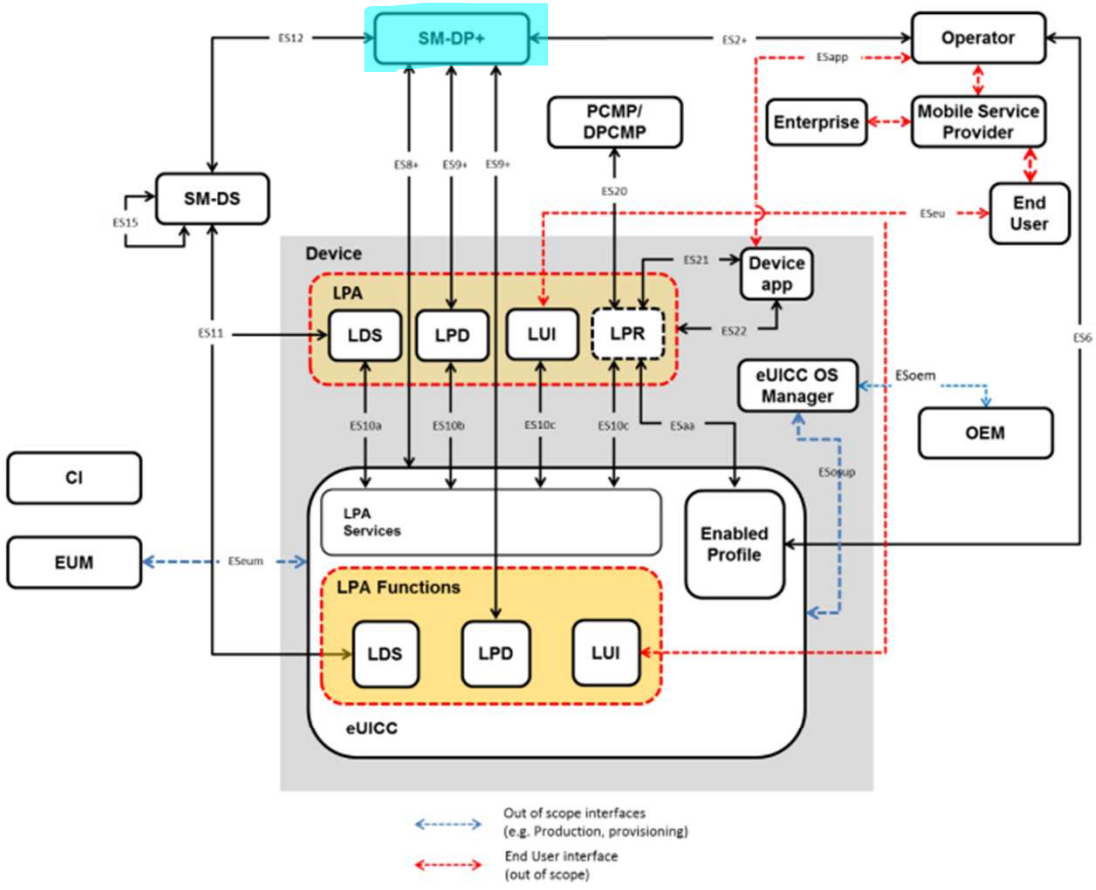
~~eUICC~~

~~LPA~~

SM-DP+

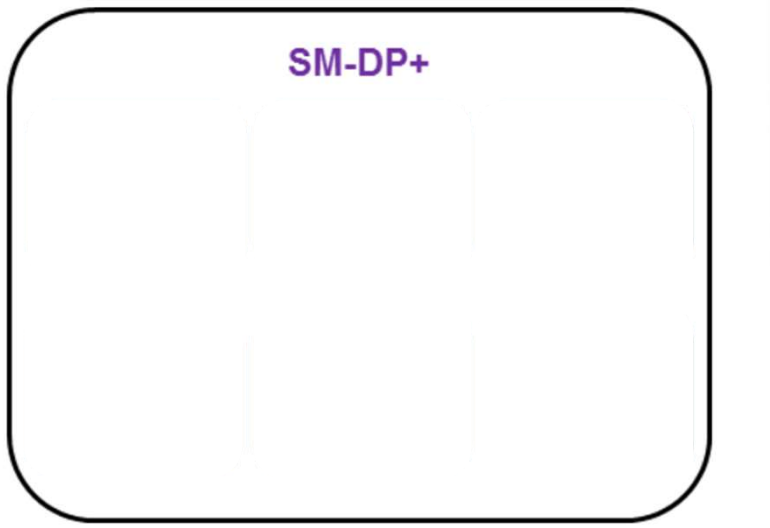
SM-DS

Remote SIM Provisioning System Architecture



SGP.21v3.0

Subscription Manager Data Preparation+ (SM-DP+)



Function name	Description
Profile Package Generation	Creates Profile Packages [i.e. Personalised Profiles, including (IMSI, Ki, ICCID…)] from Profile Descriptions agreed with Operators. This can be an off-line batch or real time process.
Profile Package Protection	Secures each Profile Package according to the security process creating the Protected Profile Package.
Profile Package Binding	Binds the Protected Profile Package to a target eUICC using the security process thus creating the Bound Profile Package.
Profile Package Storage	Temporarily stores Protected Profile Packages or Bound Profile Packages for subsequent delivery to the eUICC.
Profile Package Delivery	Securely transmits and installs the Bound Profile Package to the eUICC through the LPA.
SM-DS Event Registration	Notifies the SM-DS of a pending operation for a specific eUICC.

Table 23: SM-DP+ Function Descriptions

SGP.21v3.0

Remote SIM Provisioning System Architecture

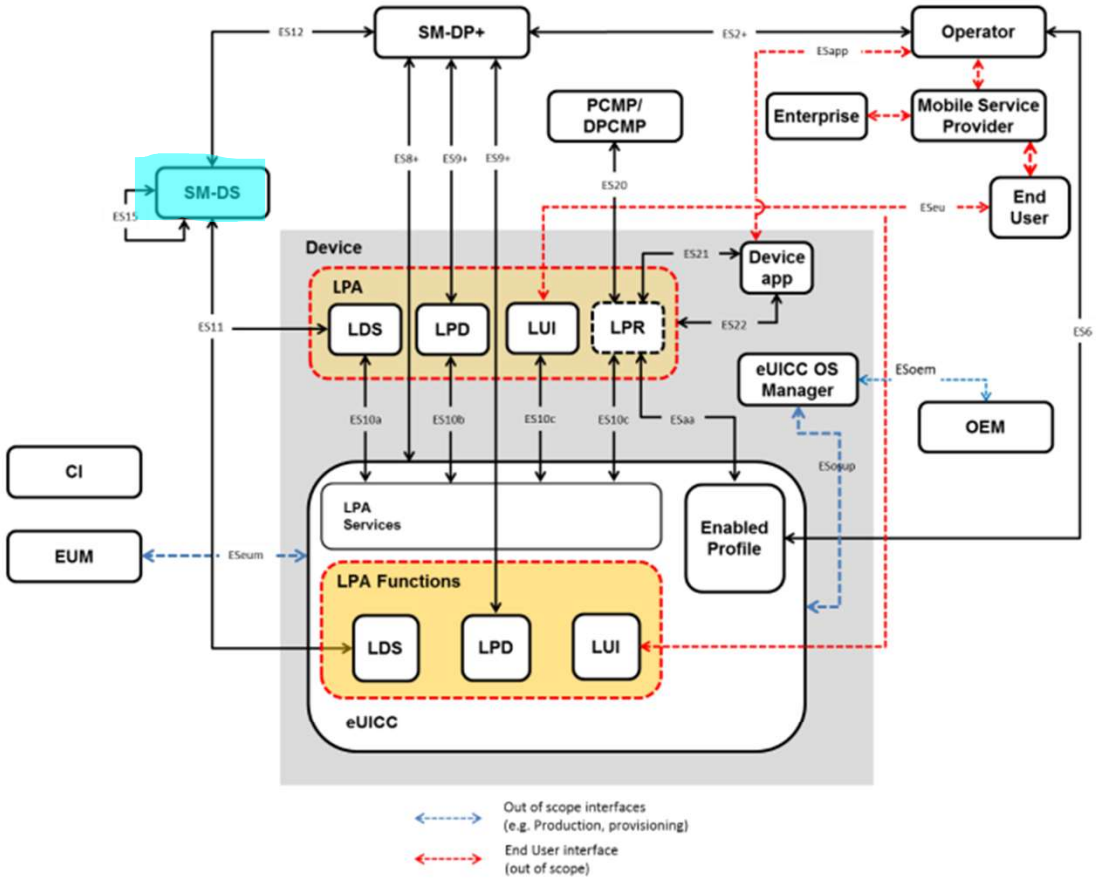
~~eUICC~~

~~LPA~~

~~SM-DP+~~

SM-DS

Remote SIM Provisioning System Architecture



SGP.21v3.0

Subscription Manager Discovery Service (SM-DS)

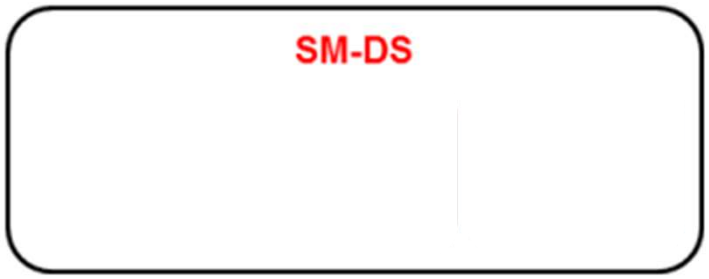


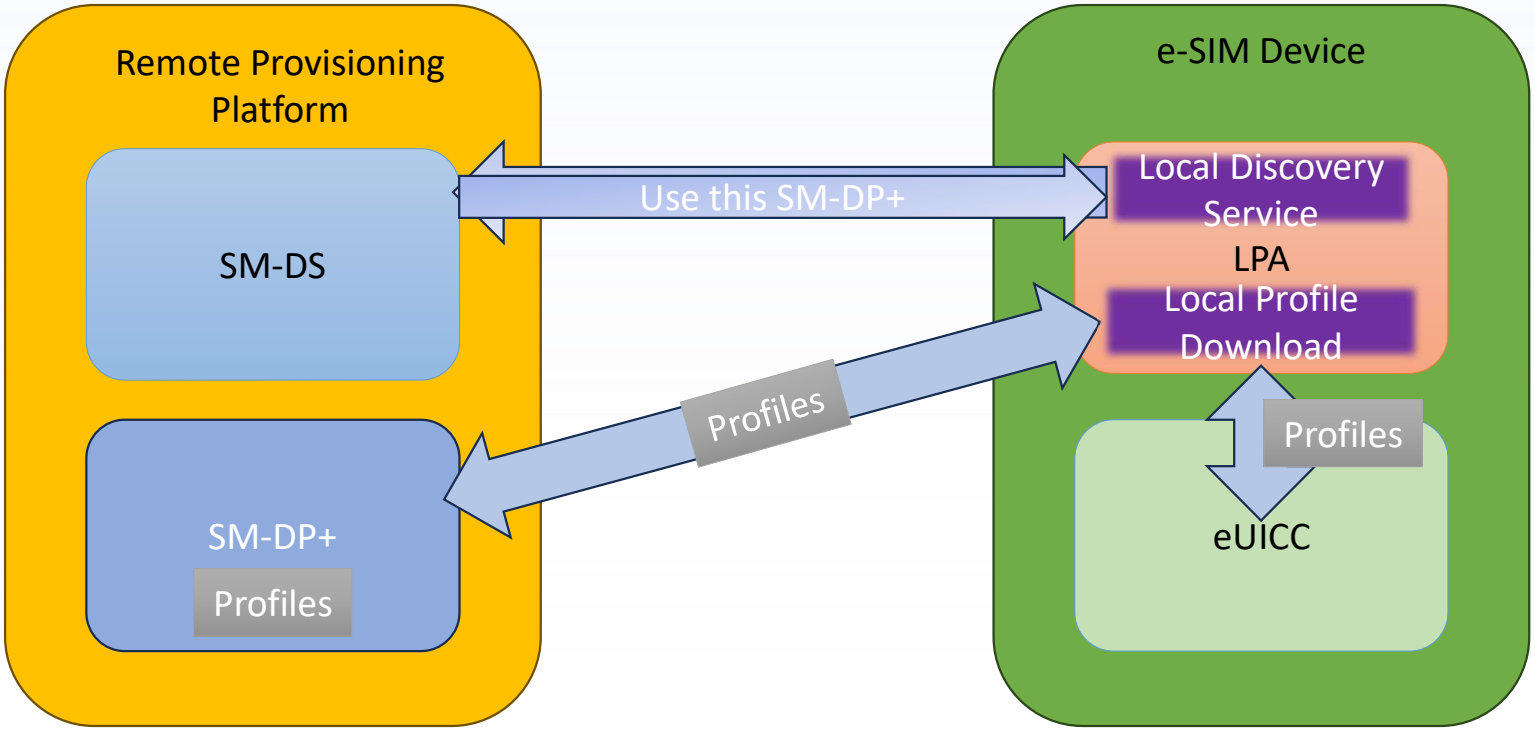
Figure 14: SM-DS Functions

Function name	Description
Event Registration	Process by which an Event Record received from a SM-DP+ is stored.
Event Deletion	Process by which an SM-DP+ can delete its own Event Record.
Event Retrieval	Provides all registered Event Records, upon Discovery Request from any enquiring LDS.

Table 29: SM-DS Function Descriptions

SGP.21v3.0

High Level Call Flow



SGP.21v3.0

~~Remote SIM Architecture~~

Driving Forces for e-SIM

Whats driving e-SIM?



CONSUMER BENEFITS



CELLPHONE OEMS



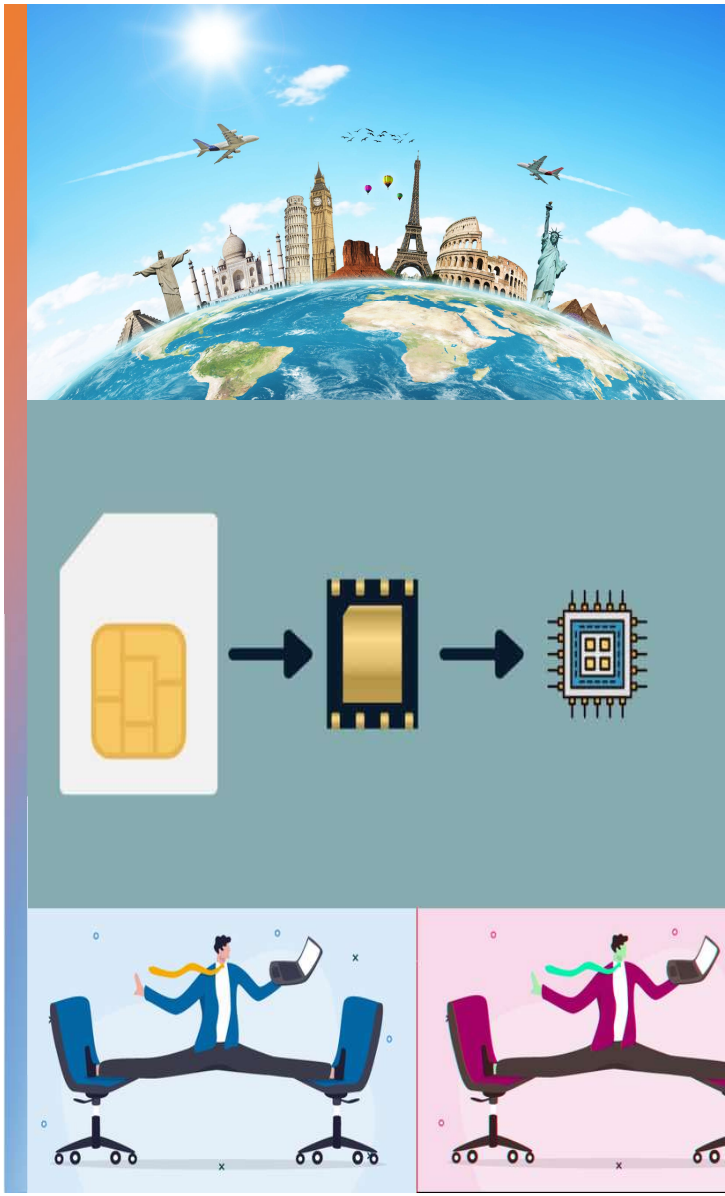
IOT DEVICES

Consumer Benefits

Moving away from physical hardware

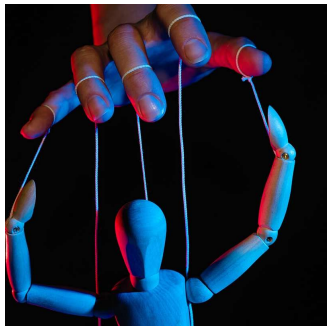
Flexibility to swap operators

International traveling



Cellphone OEMs

- Google’s Pixel 2 introduced us to technology (October 2017)
- Apple and Samsung followed suit
- Motorola released the exclusively e-SIM Razr in 2020
- Apple started manufacturing e-SIM only iPhones
- Apple’s influence in pushing new technology





Samsung
GALAXY











Other Devices

- Smart watches introduced e-SIM Technology
- 2016 – Samsung
- 2017 – Apple

- Microsoft in 2017 with Surface Pro LTE

IoT Devices & M2M Devices

Smart cities, smart meters, traffic sensors, manufacturing, vehicles

Remote provisioning

IoT devices are transitioning away from M2M SIMs

GSMA is now working on a new e-SIM standard specifically for IoT networking first version in 2022