eSIM Introduction

Quectel SW Dept. IX

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➢ **Overview**

➢ **Market Outlook**

➢ **Solutions**

eSIM

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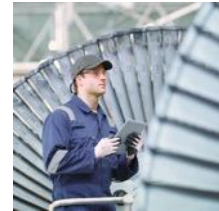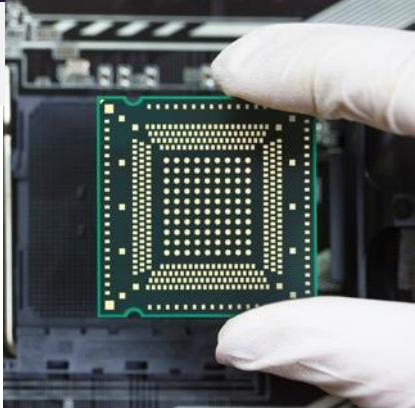
Applicable Modules

Module Series	Model
RG500Q Series	RG500Q-EA
	RG500Q-NA
RG502Q-EA	RG502Q-EA
RM500Q Series	RM500Q-GL
	RM500Q-AE
RM502Q-GL	RM502Q-GL
RM510Q-GL	RM510Q-GL
EM160R-GL	EM160R-GL
EM120R-GL	EM120R-GL
EG518R-GL	EG518R-GL
EG512R-GL	EG512R-GL

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References

Item	Description	Release Version or Issue Date
GSMA eSIM Whitepaper	The what and how of Remote SIM Provisioning	March 2018
3GPP TS 131 101	UICC-terminal interface; Physical and logical characteristics	Release 15
3GPP TS 131 102	USIM application	Release 15
GSMA SGP.21	Consumer eSIM architecture specifications	V2.2
GSMA SGP.22	Consumer eSIM technical specifications	V2.2.2
GSMA SGP.23	Consumer eSIM test specifications	V1.9
GSMA SGP.01	M2M eSIM architecture specifications	V4.2
GSMA SGP.02	M2M eSIM technical specifications	V4.2
ISO 7816	APDU protocol	/

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Terms

| Term	Full Name	Description
eSIM	Embedded SIM	As known as eUICC
EID	eSIM ID	
EUM	eUICC Manufacturer	
CI	Certificate Issuer	
SM-DP	Subscription Manager Data Preparation	
LPA	Local Profile Assistant	
Profile	Represents all the information on a SIM	Combination of a file structure, data and applications to be provisioned onto, or present on, an eUICC and which allows.

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Overview

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eSIM(embedded SIM): The embedded SIM (also called eSIM or eUICC) is a new secure element designed to remotely manage multiple mobile network operator subscriptions and be compliant with GSMA specifications.
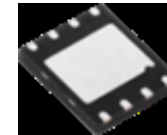
Available in various form factors, either plugged-in or soldered, the eSIM is easy to integrate in any kind of device.

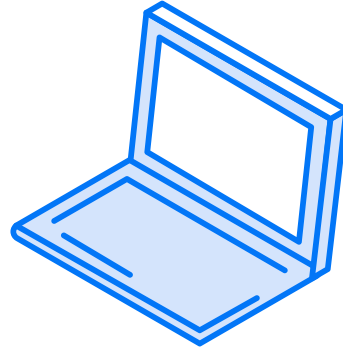|			
4FF	M2M UICC MFF2	DFN 4X4.2	WLCSP
108 mm2	5X6mm	16.8 mm2	2.5X2.3mm
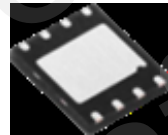
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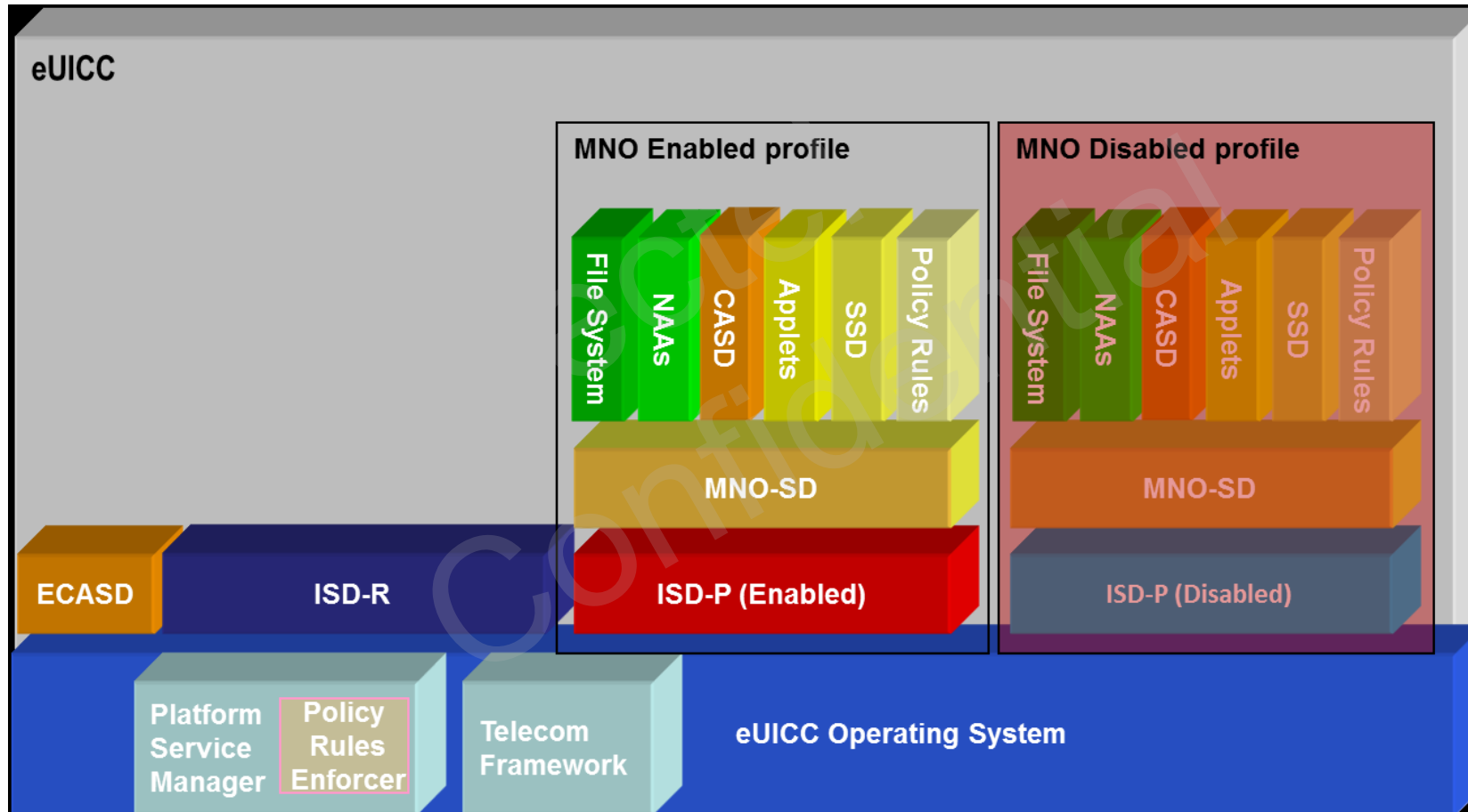# Overview
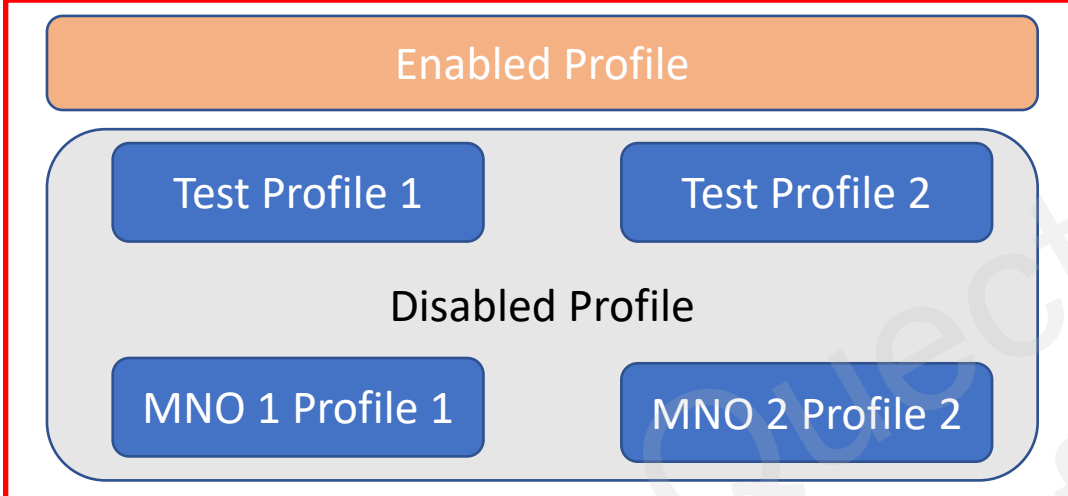
OS Architecture

EID (eSIM ID): Every one eSIM has one and only one EID, support query in any case, not limited by MNO profile status.

Profiles & Certificate Issuer

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Multiple Profiles

Enabled Profile

| Test Profile 1 | Test Profile 2 |

Disabled Profile

| MNO 1 Profile 1 | MNO 2 Profile 2 |

1. There are multi profiles in ISD-P.
2. Only one profile is enabled at mean time.
3. Test profiles for test purpose, in used to factory test.
4. Multiple MNOs and multiple profiles.
5. SIM/USIM/CSIM/ISIM/5GSIM has deferent EF structure, need consider if the eSIM can support various UICC.

Multiple Certificate Issuers

| Test CI | GSMA CI |

| MIIT CI | CU CI |

China CIs

| CMCC CI | CT CI |
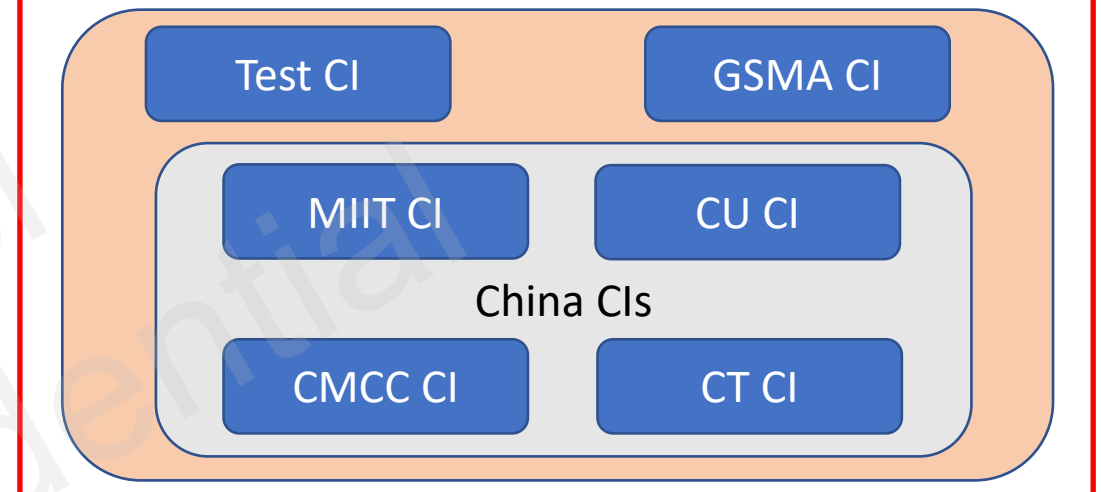
1. There are multi CI in EUM.
2. Test CI for test purpose, in used to factory test.
3. GSMA CI is applicable to almost all of MNOs.
4. China has special CIs for each MNO, and MIIT is a common China CI.

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Market Outlook: eSIM for all devices

Automotive & IoT | Laptops & tablets | Watches | Phones

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Traditional SIM card Deployment

Remote SIM Provisioning Deployment

Remote SIM Provisioning Deployment

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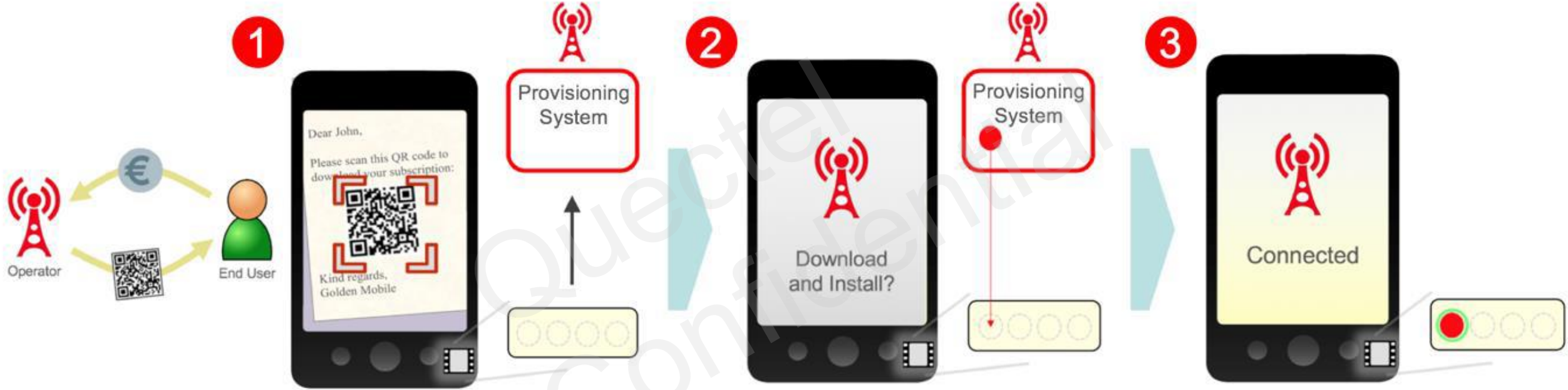
Solution: Consumer & M2M
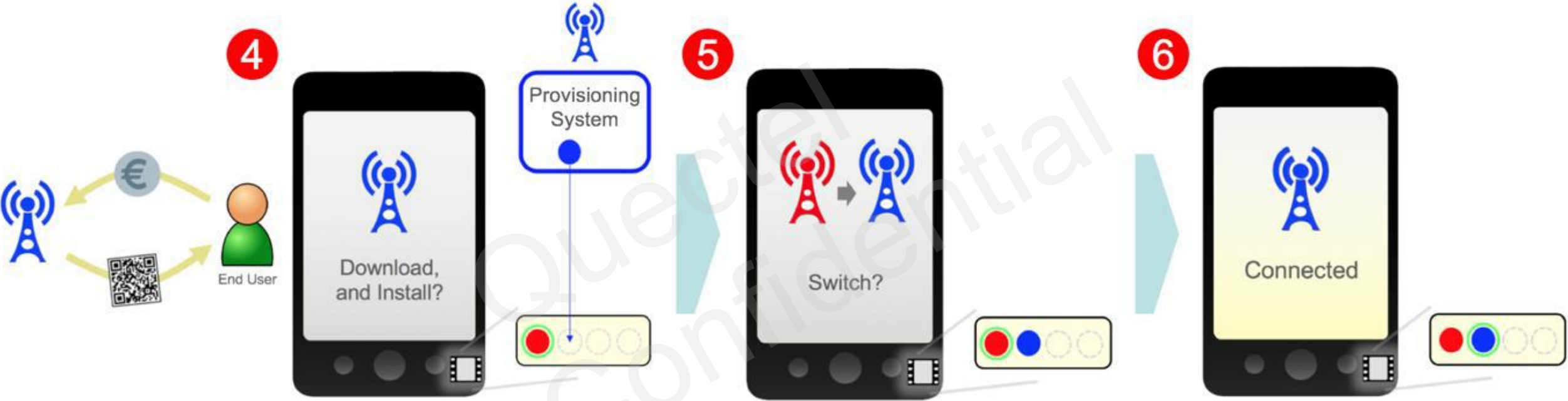
Consumer eSIM

For the 'direct to consumer' channel, this solution is required where the end user (or consumer) has direct choice of the operator supplying connectivity. Consumer solutions require a high degree of end user interaction, with the principle that the end user is familiar with operating the end user interface and actively choosing their network connectivity provider. The Consumer solution also targets enterprises who use devices targeted to the consumer market.
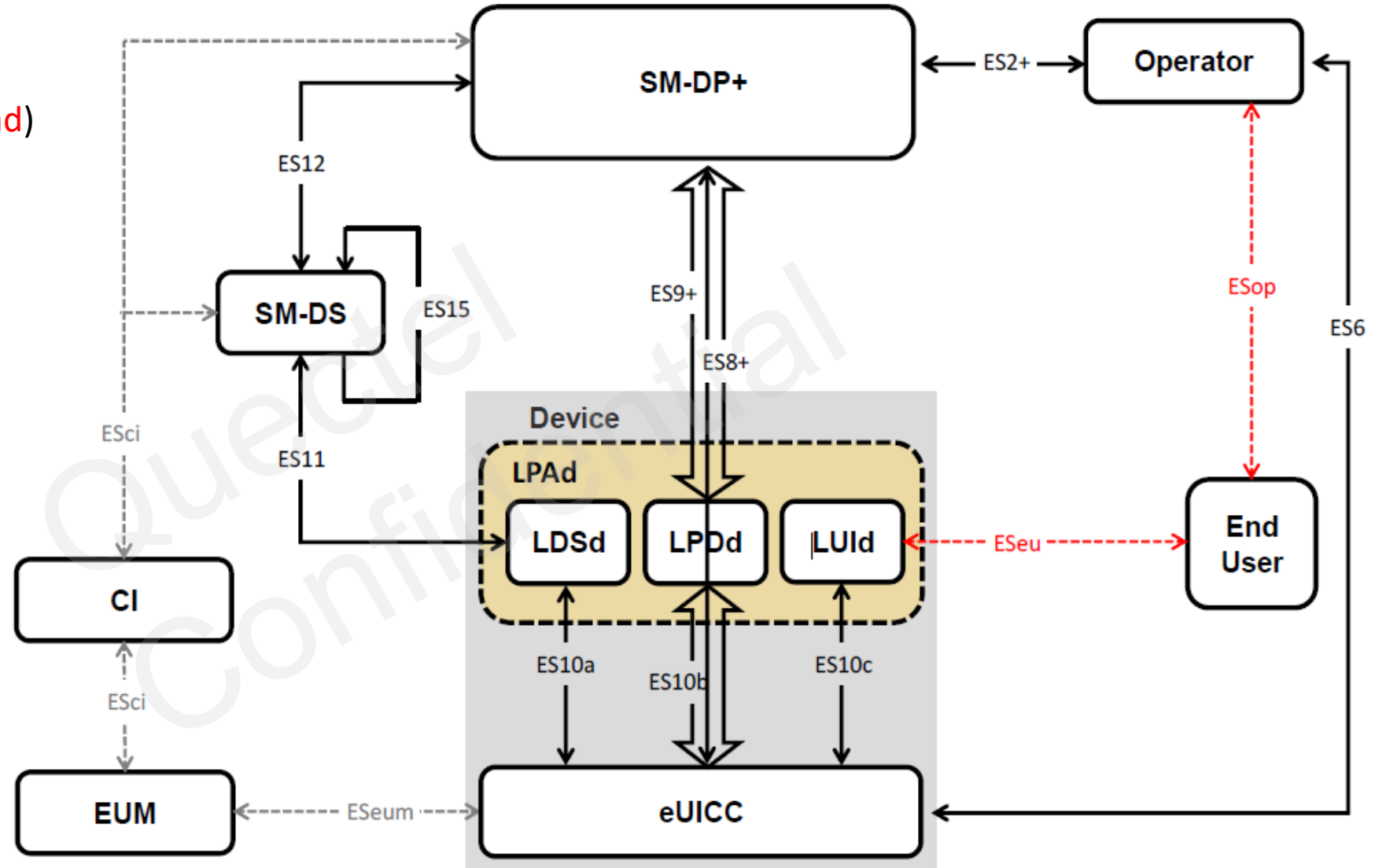
M2M eSIM

For channels, this solution serves the needs of business to business customers, specifically in the Internet of Things (IoT) market. the 'business to business to consumer'

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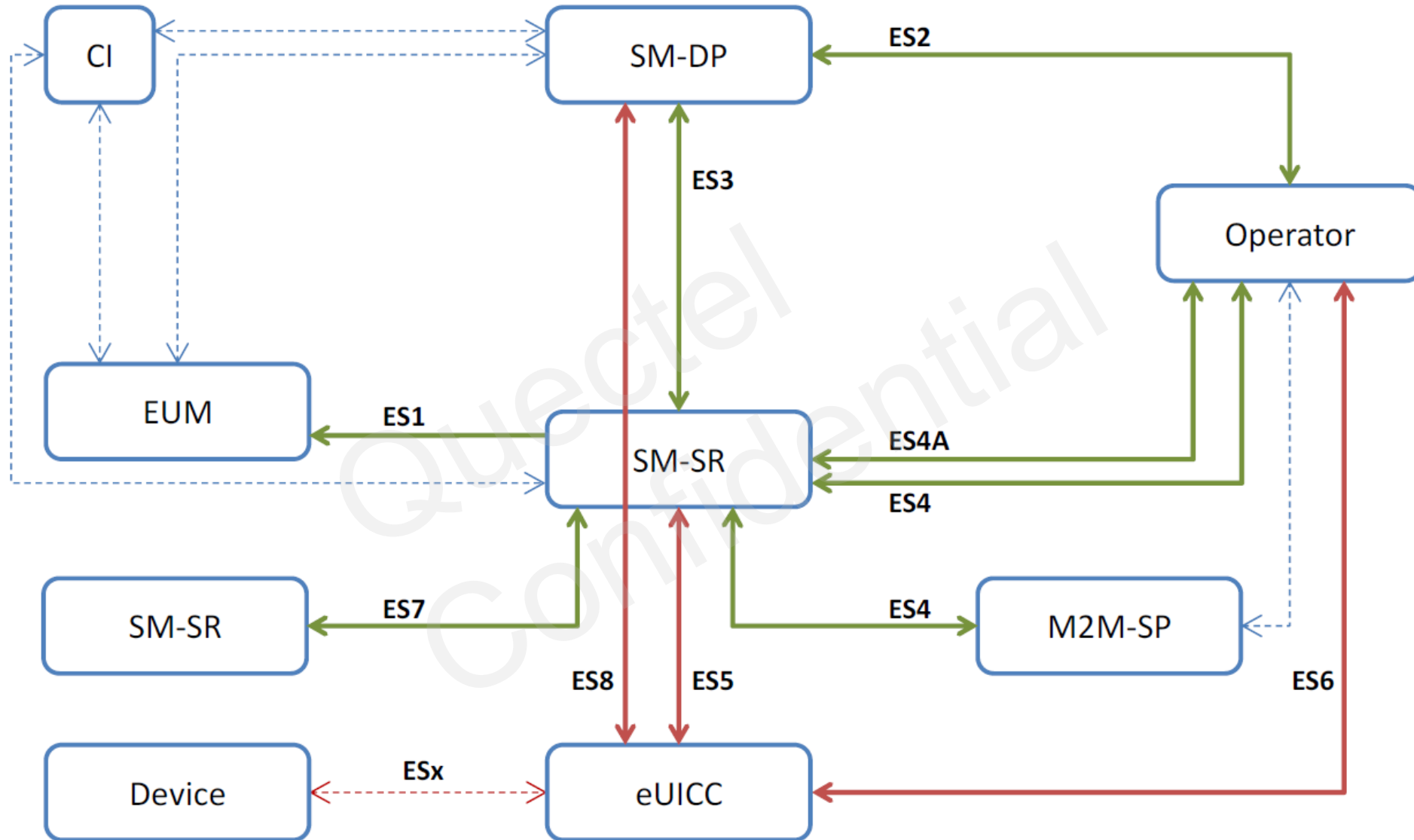
Consumer eSIM

LPAd: LPA in **device** (Recommend)

LPAe: LPA in **eSIM** (Deprecated)

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M2M eSIM

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eSIM OS Upgrade

Need align with host, module and eSIM manufacturer.

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M2M eSIM Solution

Support following commands and functions, eSIM control by SM-DP+ server.

AT / Function	Description
AT+CSIM	Send APDU
AT+CCHO	Open channel
AT+CCHC	Channel control
SMS	SMS for trigger HTTP setup
BIP	For eSIM profile OTA update

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Consumer eSIM for win10

Win 10 (OS 1703 or higher) has already implement LPA, module needs to support the MBIM APIs of the relevant eSIM.
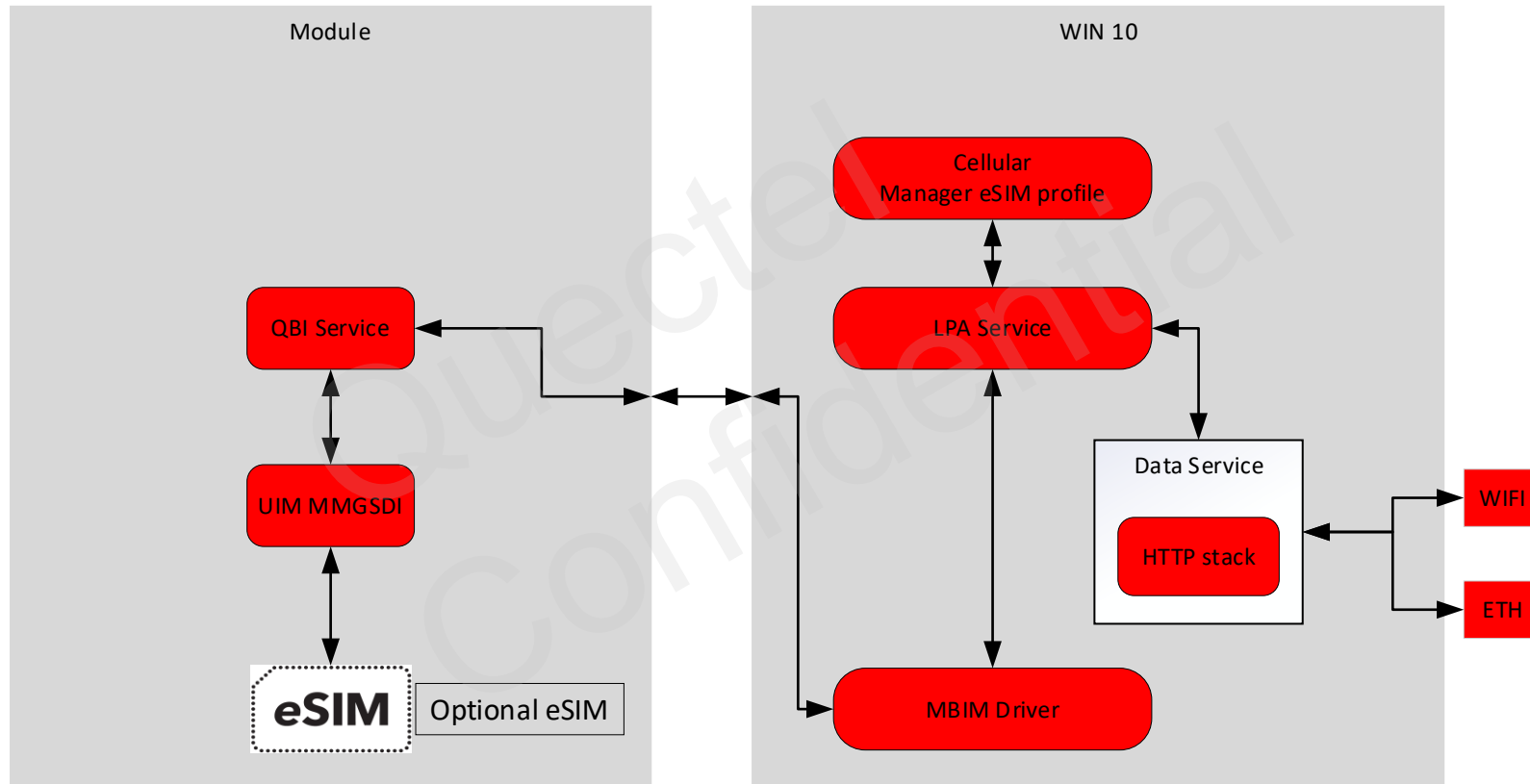
Quectel LPA Software Schedule

2021			
Q1	Q2	Q3	Q4

Evaluation
3/15

SW design
4/7

Fully develop
6/1

Commercial
7/1

- Development Design
- AT command definition
- Documents

- Develop
- SW self-test
- ST fully test
- Bug fix

- Lab test
- Certification
- User guide
- Documents

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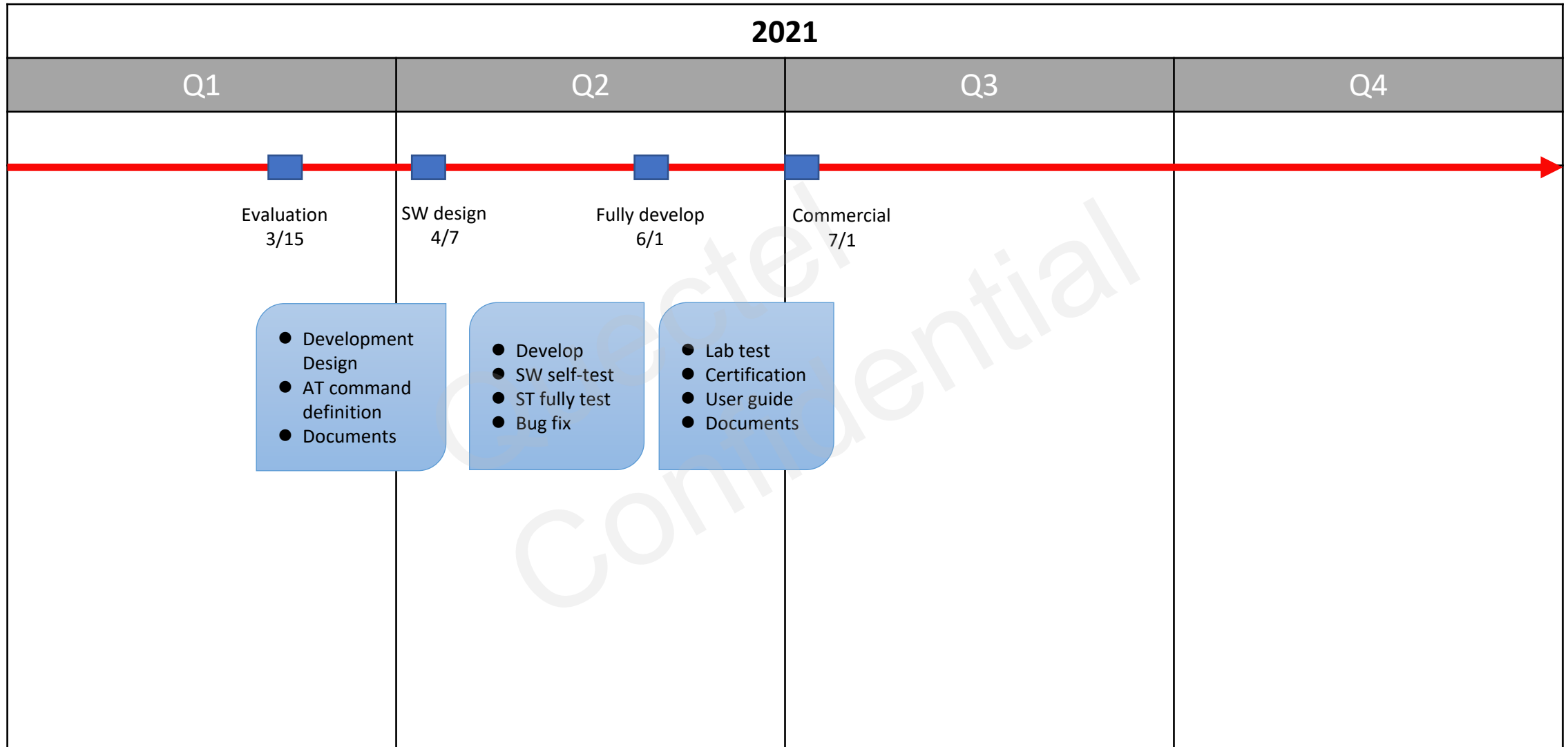
# Quectel eSIM AT Commands

AT / Function	Description
AT+QESIM	AT command table entry
AT+QESIM="lpa_enable"	Enable Quectel LPA
AT+QESIM="profile_brief"	Query Profile brief information
AT+QESIM="profile_detail"	Query Profile detail information
AT+QESIM="eid"	Query EID
AT+QESIM="delete_profile"	Delete profile
AT+QESIM="nickname"	Set nickname
AT+QESIM="def_svr_addr"	Set default SM-DP+ server address
AT+QESIM="disable_profile"	Disable profile
AT+QESIM="enable_profile"	Enable profile
AT+QESIM="add_profile"	Add profile from SM-DP+
+QESIM: "add_profile"	URC for add profile

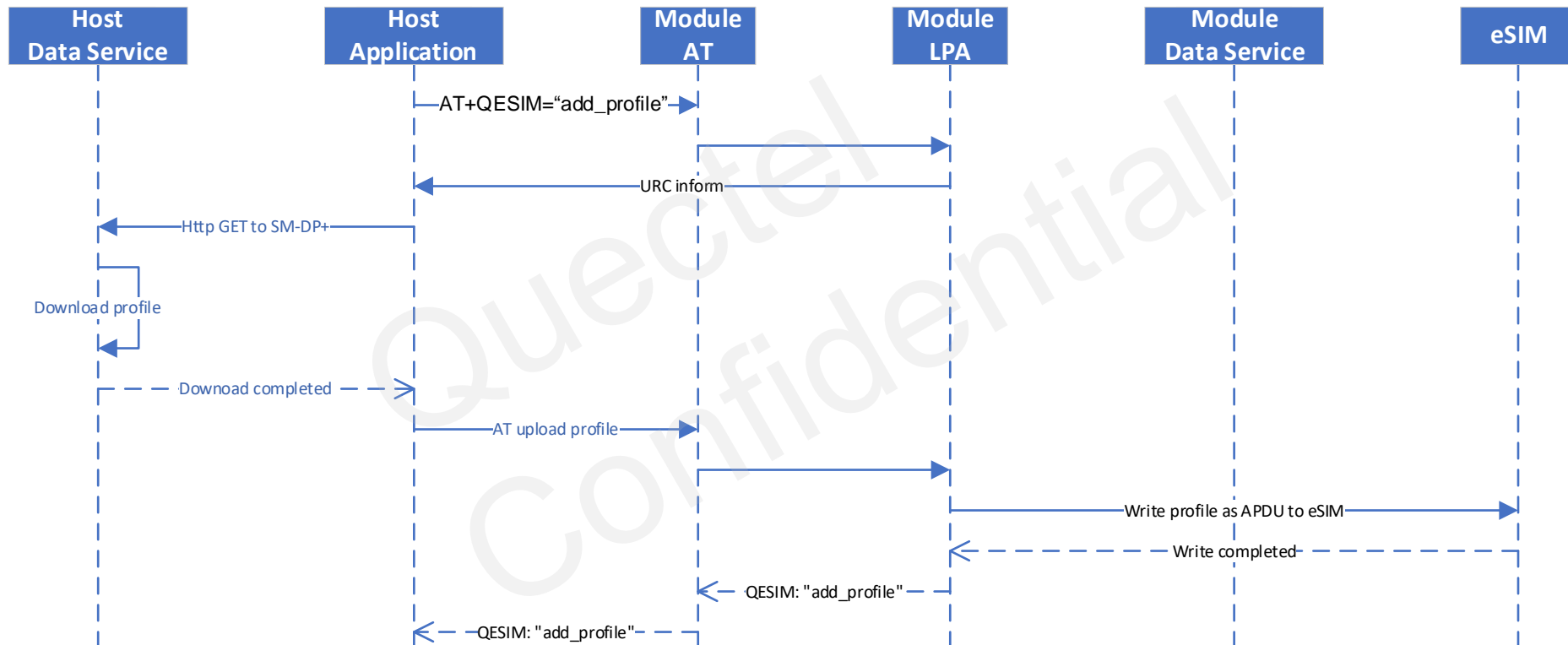Build a Smarter World

Quectel LPA Architecture
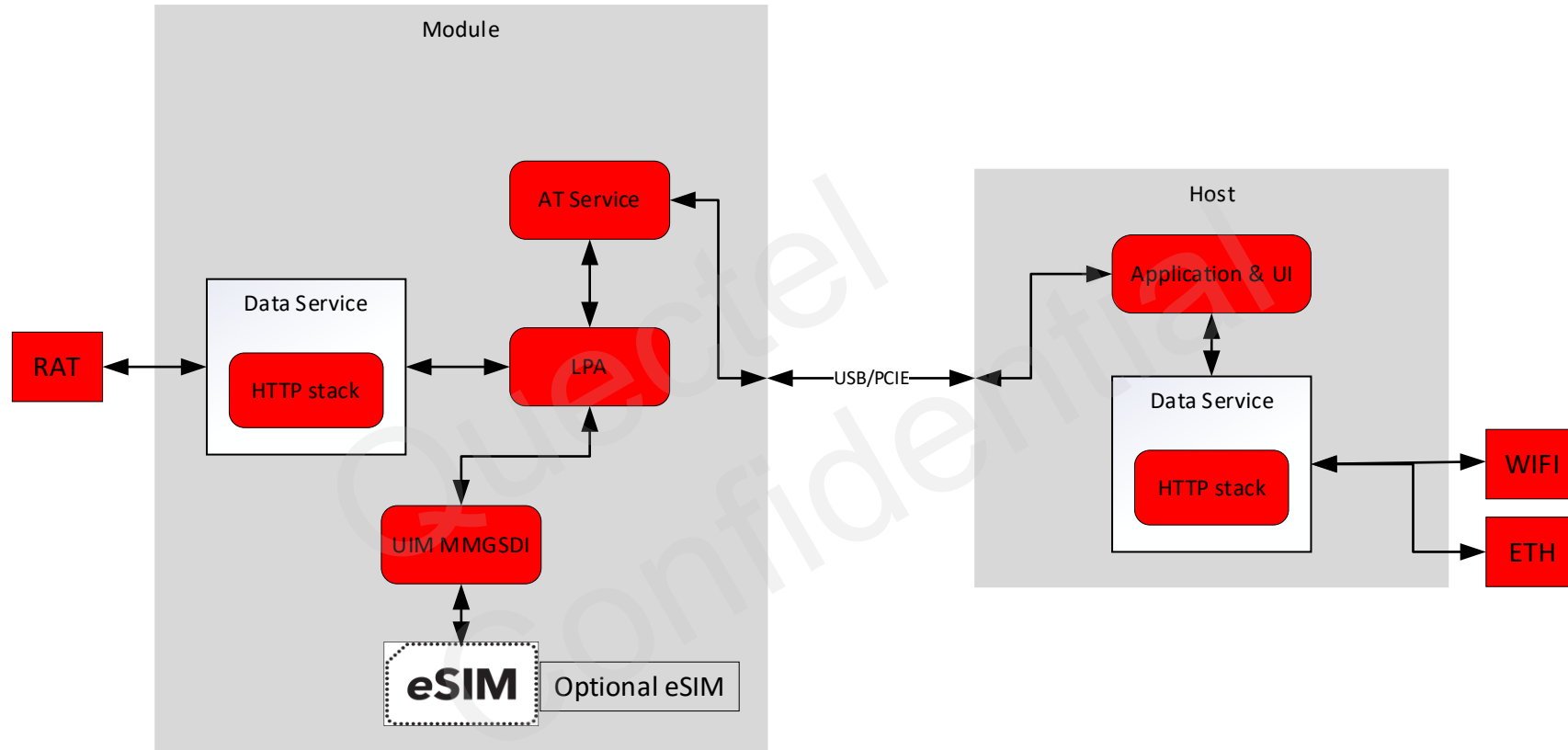
Add profile via module(internal) data connection
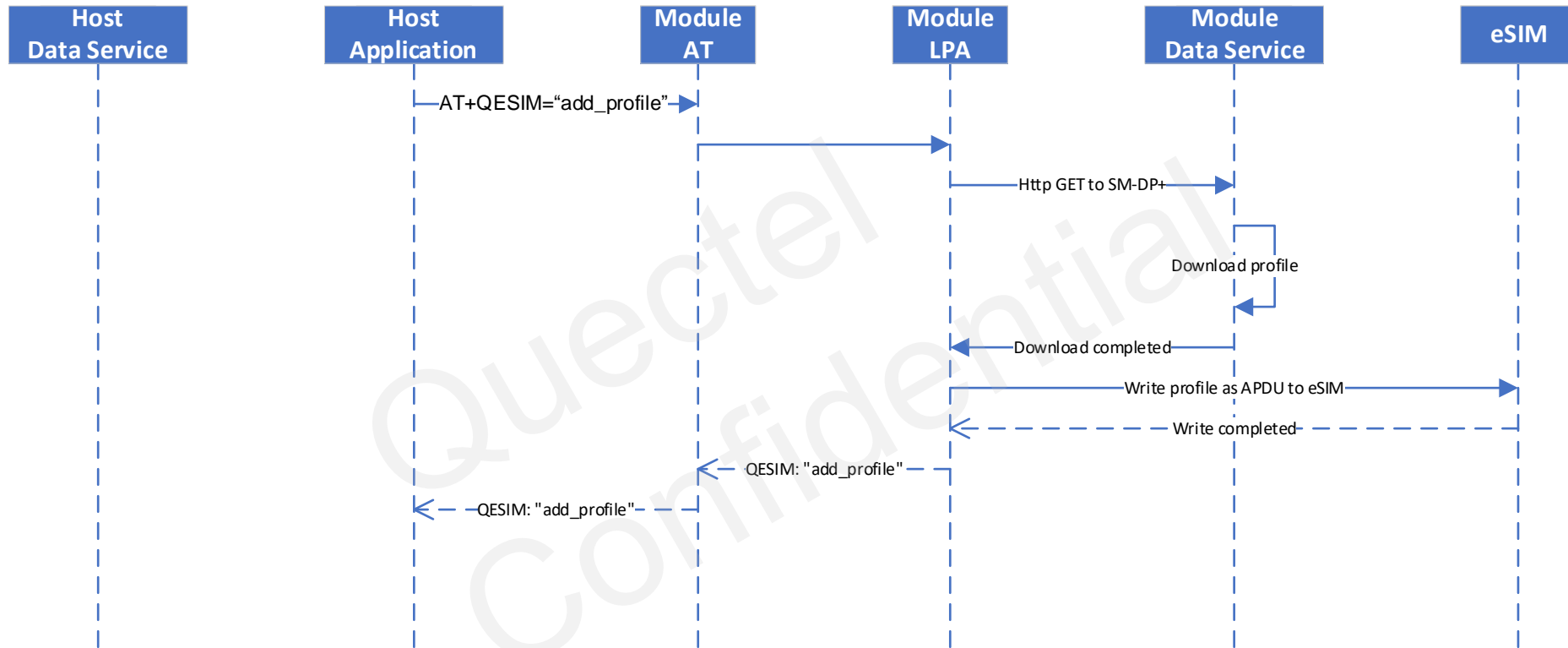
Add profile via host(external) data connection

In planning, will **NOT** ready at Q3!

The number one cellular module vendor in the world and a leading GNSS module supplier

- Unbeatable choice from the broadest module portfolio in the world
- The highest quality products for the best possible prices
- Superb support with the largest R&D team in the industry
- Continuous innovation – first to market with 5G, LPWA, CV2X, snapdragon
- A passionate, dedicated team of "Quectelers" ensure our customers always come first

ThankYou

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