



SIM Provisioning via OTA Platform

by SK C&C CorFire

So your new network requires SIM cards....♪

SIM Cards

- Provisioned with network parameters used by the phone / modem to connect
- Standardized files by 3GPP & 3GPP2, including roaming network preferences
- Network access CDMA & LTE with authentication algorithms and keys
- Applets to add on to standard behavior

SIM OTA

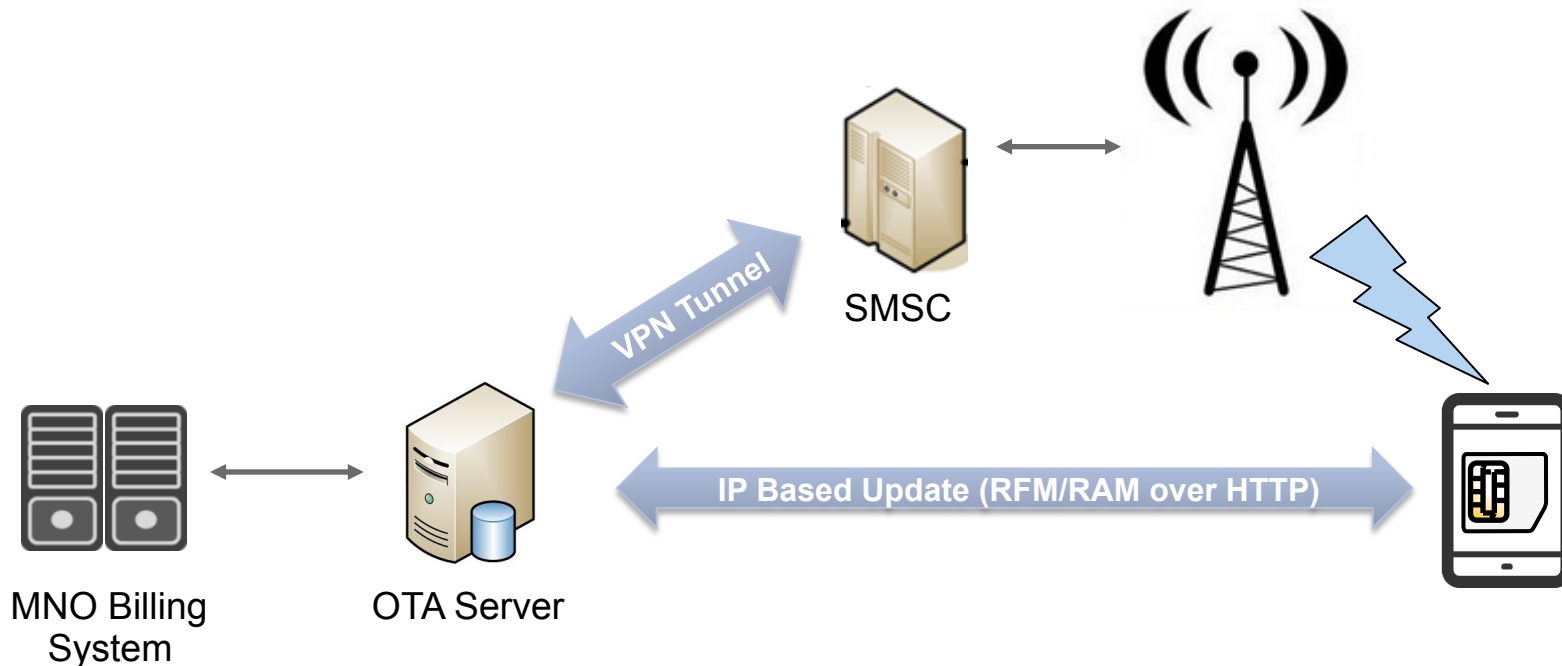
- Last minute parameter update at time of activation: “OTA activation”
- Regular update of roaming files “OTA campaigns”
- Exceptional fixes requiring file updates or applet downloads

You might still need other OTAs

- OMA DM / TR69

SIM Provisioning via OTA

SIM Provisioning via OTA is to update Subscription Information, Roaming List and other information MNO wants to update on their customer's SIM at the time of activation or later.



USIM	CSIM	ISIM
<ul style="list-style-type: none">LI (Language Indicator)IMSI / MSISDNSMSP (SMS Parameter)HPLMN/OPLMN/FPLMNLOCI (Location Information)ECC (Emergency Call Control)	<ul style="list-style-type: none">IMSI_MMDNMIPUPP (MobileIP User Profile Parameter)PRLEPRL	<ul style="list-style-type: none">IMPI (IMS Private User Identity)DOMAIN (Home Network Domain Name)IMPU (IMS Public User Identity)P-CSCF (P-CSCF Address)

Multiple Bearer Types for SIM Provisioning

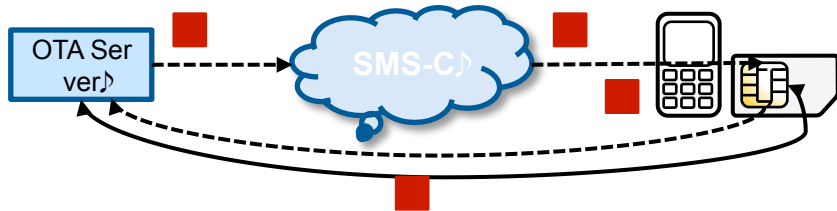
Push OTA requires SMS type Data Download (the type sent directly to the SIM)

Push OTA small payload: SMS – PP Bearer



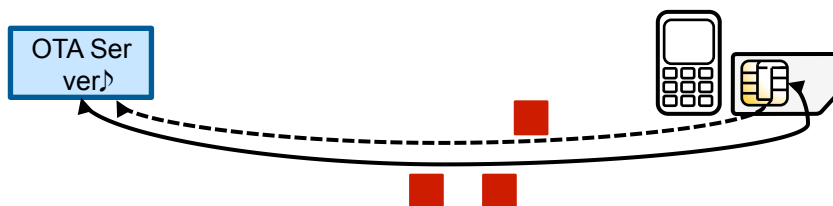
1. OTA Server request for sending a command Mobile device **using SMS**
2. SMS-C sends a command to SIM on Mobile device
3. Mobile device sends SMS response to SMSC
4. Communication using SMS via SMS-C

Push OTA large payload: SMS + CAT-TP or HTTP



1. OTA Server request for sending push command to Mobile device **using SMS**
2. SMS-C sends a push command to SIM through the Mobile device
3. SIM requests the mobile device to connect to OTA
4. Communication using UDP or HTTP

Pull OTA: RAM/RFM over HTTP



1. SIM Polling applet initiates an HTTP post request to OTA
2. Mobile device connects to OTA Server
3. Communication using HTTPs

OTA for Each Network♪

SIM OTA service is different depending on existence of SMS PP Data Download

- With SMSC, OTA platform sends a command via SMSC to SIM
- Without SMSC, Polling applet contacts to OTA platform for updates

	UMTS/LTE♪	CDMA/LTE♪	LTE Only♪
SIM♪	<ul style="list-style-type: none">▪ SIM/USIM/ISIM Profile♪	<ul style="list-style-type: none">▪ USIM/CSIM/ISIM Profile♪	<ul style="list-style-type: none">▪ USIM/ISIM Profile♪
OTA♪	<ul style="list-style-type: none">▪ VPN connection with SMSC▪ SMPP Binding to SMSC▪ Via SMSC, sending OTA commands and receiving responses from SIM♪	<ul style="list-style-type: none">▪ Open channel with Polling applet on SIM▪ TLS PSK Handshake between OTA platform and SIM▪ Exchange data for update on SIM▪ Close channel once update is done♪	
Polling applet♪	<ul style="list-style-type: none">▪ No need for Polling applet♪	<ul style="list-style-type: none">▪ Polling applet needs for SIM update in case of without SMSC♪	
Frequently Used applets♪	<ul style="list-style-type: none">▪ IMEI Lock & Device Detection▪ FPLMN Clear▪ Loci Lock▪ Call Redirect▪ Multi-IMSI (Multi-Subscription)♪		

Common Applets used by carriers♪

SK C&C CorFire provides following applets commonly used by carriers♪

IMEI Lock♪

- This applet locks the SIM to one mobile device
- When SIM is inserted into another device, it checks IMEI value from the device and if the value is different from the existing value, this applet will lock the SIM, so the SIM doesn't work

FPLMN Clear♪

- This applet clears the FPLMN file when the file is updated
- When a SIM is rejected from a network, the network's MCC and MNC is populated on the FPLMN file and SIM will not retry to the network, however, this could be a temporary problem or could have been addressed with a change of roaming agreements

LOCI Lock♪

- This applet prevents LOCI file on SIM from being updated
- This is to encourage SIM to connect to Home Network quickly

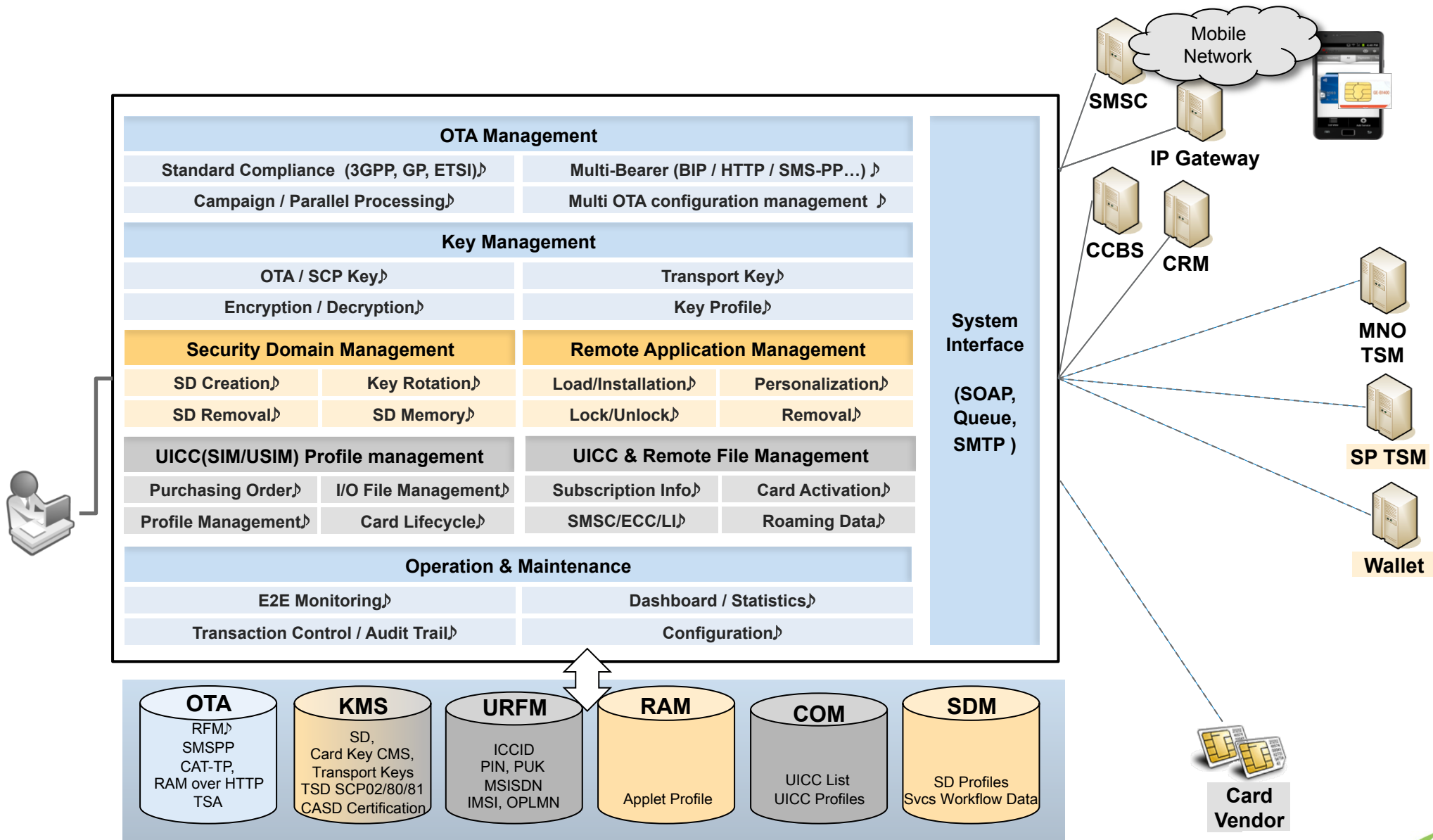
Call Redirect♪

- This applet uses a call control event sent by the phone when a user inputs a number (such as customer center 611 when roaming) and it redirects the call to a different number (such as the 1 800 customer center number)



Multi-IMSI♪

- This applet catches location information updates event and changes basic subscription information such as IMSI, PLMN, SMSP based on the current location
- The subscription information is stored on files on SIM or can be stored in the memory of this application

OTA Platform Overview



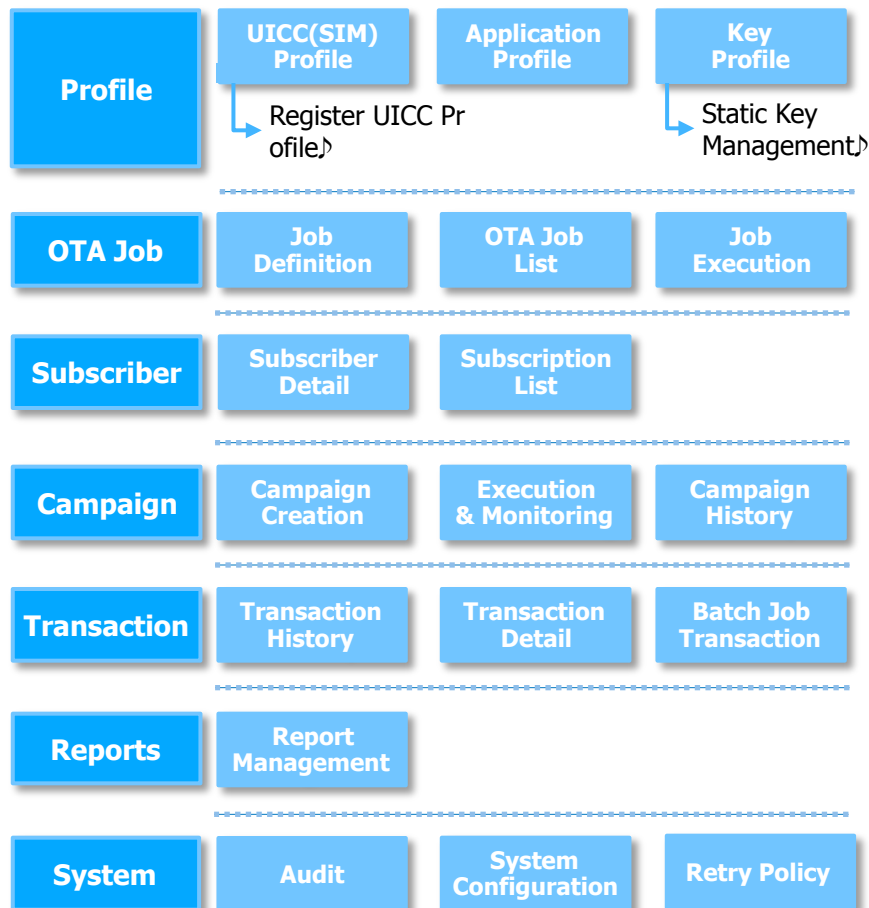
OTA Use Cases

Use Case Group		Use Cases
	Subscription Management	Register/Suspend/Reactivate/Terminate Subscription Update Subscription (Update IMSI, IMEI) Change MSISDN Get Subscription Status/Details
	Multi-Subscription Management	Activate/Deactivate Multi-Subscription Applet Read/Update/Delete MCC Table Read/Update/Delete Subscription Information Table Activate/Deactivate Manual Swap of Subscription
	Remote File Management	Create/Delete/Activate/Deactivate Files Update/Read Files Resize Files
	Remote Application Management	Load/Install/Delete Applets Extradite Applets Change Lifecycle of Applets
	UICC Management	Register/Delete/Update UICC Profiles Register UICC
	Campaign Management	Update Files or Managing Files/ Applications for multiple UICCs at once
	Device Detection	Device change history management

Admin Portal Functions

For Operation Maintenance & Administrative services, Admin manages Profile(UICC), OTA Job, Subscriber, Transaction, Reports, and System categories via Web-Client


OTA OM&A Web Client Menu



Profile Menu

In Profile Menu, Admin has an authority to register and search the list of UICC Profiles, Application Profiles, and Key Profiles.

[Contact Us](#) | [My Account](#) | [Logout](#)



SIM OTA Service Platform

Welcome Super Admin

[Profile](#) | [OTA Job](#) | [Subscriber](#) | [Transaction](#) | [Reports](#) | [System](#)

[Home >> UICC Profile List](#)

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UICC Profile List

Reset
Search

	PROFILE ID	PROFILE NAME	SE TYPE	PROVIDER	REGISTRATION DATE
1	2B0601040181DB69640888	SKCC SIM for QA Test	UICC	SKCC	05/22/2014
2	20140512-1	SKCC UICC Profile	UICC	SKCC	05/12/2014
3	2B0601040181DB69640999	SKCC USIM - MSISDN Test	UICC	SKCC	04/30/2014

2

Application Profile List

Reset
Search

	PROFILE ID	PROFILE NAME	DESCRIPTION	LF PROFILE	REGISTRATION DATE
1	2B0601040181D40F64018923	Enterprise Access v1.0	Enterprise Access v1.0	6086480186FE2D64049645	05/19/2014

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Key Profile List

Reset
Search

	PROFILE ID	PROFILE NAME	OBJECT TYPE	KEY TYPE	PROVIDER	REGISTRATION DATE
1	qq	qq	PRIVATE_KEY	AES	12	05/12/2014
2	TESTKEY	TESTKEY	PUBLIC_KEY	DES2	aa0	05/12/2014
3	aaa	bbb	PRIVATE_KEY	DES	ab	04/07/2014

Description

- 1 UICC Profile**
- Profiles for UICC could be registered or edited by an admin
- 2 Application Profile List**
- Application profiles could be adjusted to UICC Profile
- 3 Key Profile**
- Key profiles could be registered or edited

What needs to be done for SIM Provisioning via OTA

- A) **SIM Information Import**
- B) **Integration with 3rd Parties**
- C) **Provisioning**

SIM Information Import

Following information needs to be loaded onto OTA Platform for SIM provisioning

SIM Information

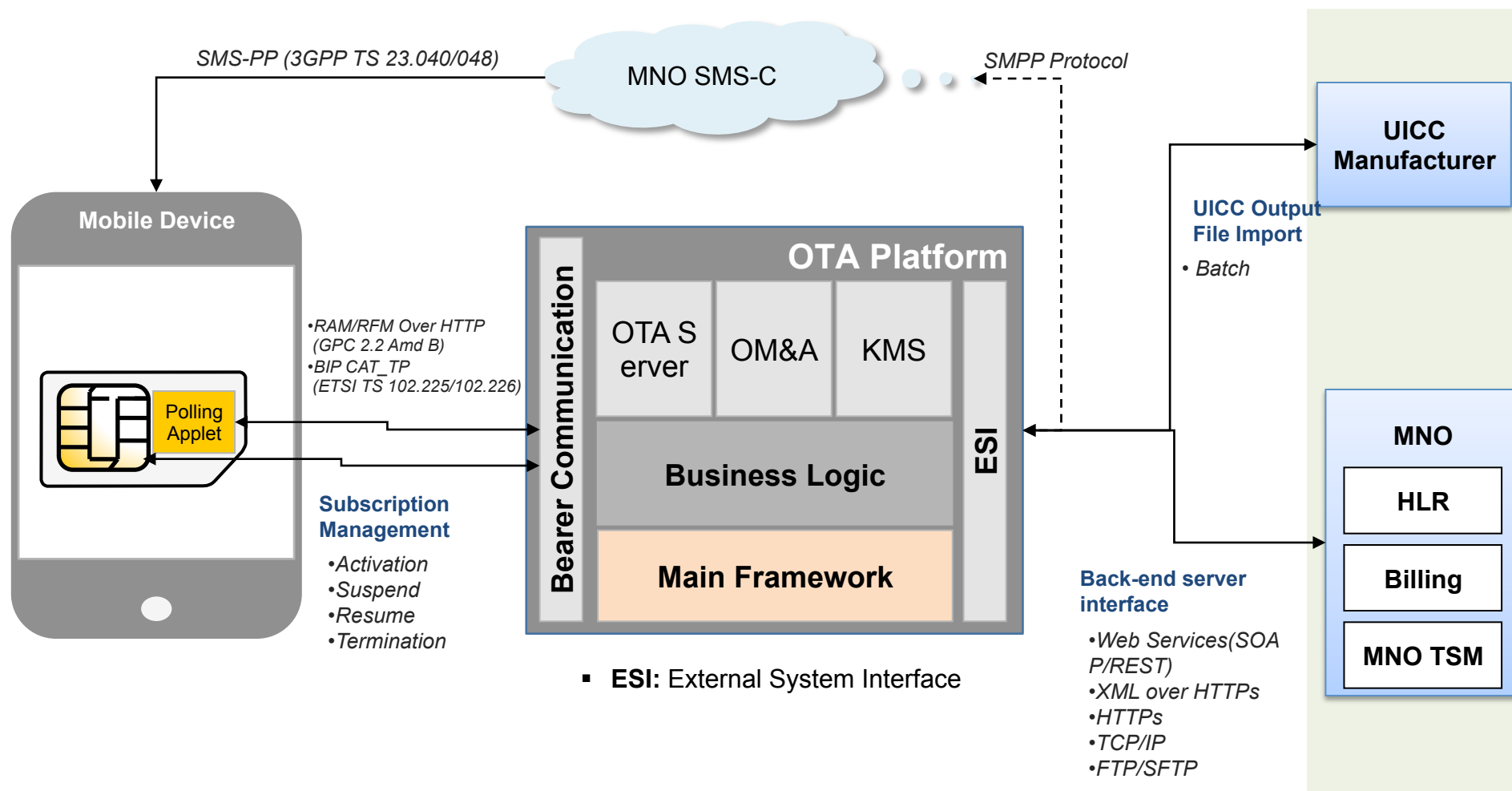
SIM Profile	<ul style="list-style-type: none">File Structures and Initial DataProfile Version
Output File	<ul style="list-style-type: none">IMSI/ICCIDPIN/ADMOTA KeyTransport Key
Application	<ul style="list-style-type: none">Pre-loaded ApplicationPre-Installed Application
Vendor Information	<ul style="list-style-type: none">Vendor NameVendor Product Information: Name, Version
Chip Info	<ul style="list-style-type: none">Chip Name, Model, VersionChip ManufacturerMemory Size

Integration Information

VPN	<ul style="list-style-type: none">VPN Device InformationAuthentication MethodEncryption AlgorithmHashing AlgorithmIP address
SMPP Binding	<ul style="list-style-type: none">IP/Port informationSystem ID/PasswordTON/NPIBind TypeMax ThroughputBind Source/Destination Number

Integration with 3rd Parties♪

SIM OTA Platform needs to integrate with 3rd Parties such as Billing System and SMSC♪



Common Pain Points of MNOs

SIM Profile

- Not existing
- SIM/ISIM/CSIM/USIM: what do you need?
- What Applets?
- Does Not match with current SIMs in the field
- Wrong File Information: Access Condition, File Size
- Wrong TAR/Key Set

Output/Key File

- Missing Output/Key files
- No Transport Key, Algorithm
- Wrong OTA Key values

Subscription Information

- Not Up-to-date subscription information

Miscellaneous

- Text display when update
- No MO Plan



Thank you!! *kevinan@corfire.com♪*

“CorFire’s mCommerce experience and execution was central in helping us to meet our aggressive implementation schedule.” Christian Wirtz, Group Director mCommerce & mWallet, Vodafone

Deutsche Telekom

Telefonica



vodafone

China
unicom 中国联通

SK telecom

“SK C&C is our UICC Management System partner of choice. It provides us with a state-of-the-art and powerful interoperable platform with excellent support.” Yang Jung Keun, VP UICC Management System, jungkeun.yang@sk.com



at&t

Atlantic Tele-Network

SingTel

“The SK C&C CorFire team has helped to bring up 3 different GSM/UMTS platforms for OTA delivery, and an OTA platform for CDMA/LTE delivery via a SIM applet with our networks. We have also transitioned our SIM card provider to SK C&C CorFire based on their flexibility and reliability of their solution set.

I can honestly say that SK C&C CorFire gets problems resolved quickly, and responds quickly to inquiries.”

- David Wittekind, Director Roaming Operations ATN