July 23, 2018

Technical solutions to address falsification of unique identifiers to combat device counterfeiting and theft

Mohammad Raheel Kamal

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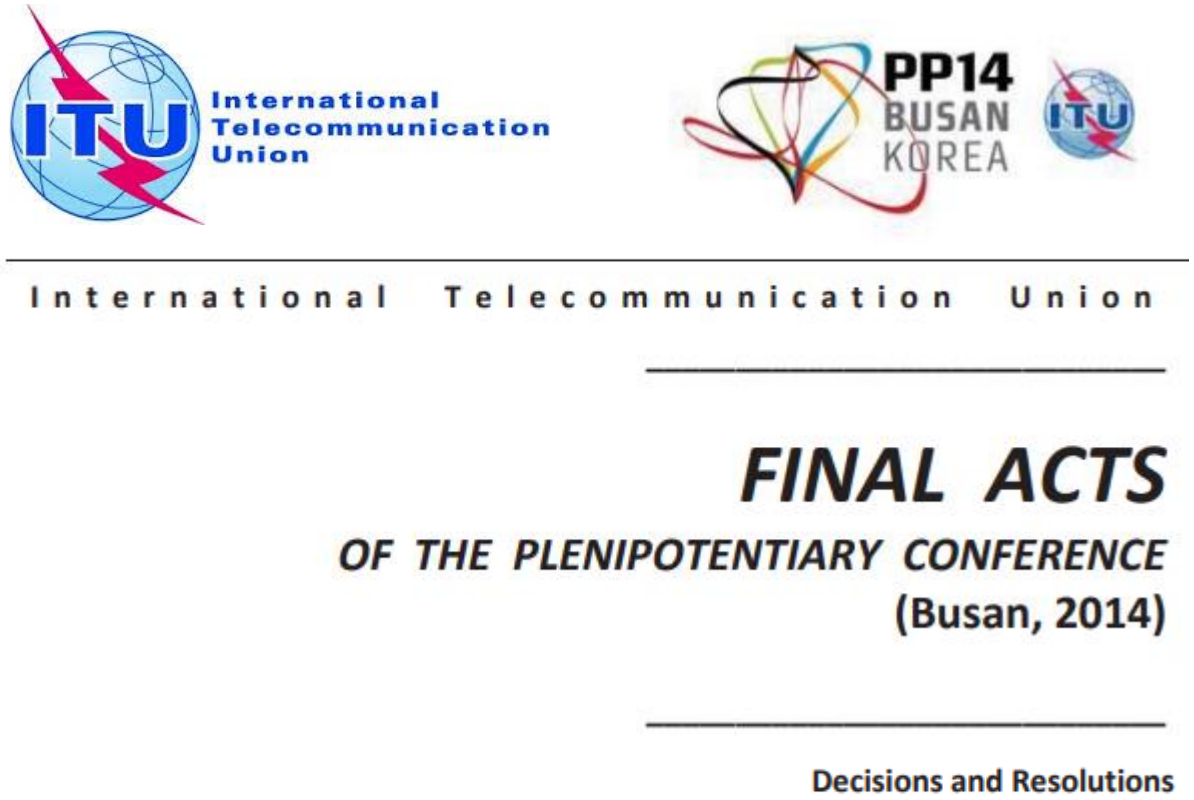
Defeating Counterfeiting & Theft with Legislations, Regulations & Technology

- Due to scale of the negative impacts to the ecosystem caused by fraudulent devices, governments and industry are increasingly interested in methods to address this growing problem
- Governments are motivated to implement regulations to assist in controlling the fraudulent device market by a range of issues including:
  - Theft deterrence
  - National security
  - Protection of tax revenues
  - Anti-counterfeiting
  - Consumer safety
  - Maintaining network quality

Proper regulatory and technical framework can serve as an excellent foundation to controlling the proliferation of counterfeit, illegal, non-compliant & stolen devices.



- Telecommunication/ICT devices that do not comply with a country's applicable national conformity processes and regulatory requirements or other applicable legal requirements should be considered unauthorized for sale and/or activation on telecommunication networks of that country

- Tampering with unique device identifiers diminishes the effectiveness of solutions adopted by countries

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Overview of International IMEI Regulations

- Many counties at different stages in the fight against fraudulent and counterfeit devices

Type Approval	IMEI Requirement & Validation	IMEI Tampering Laws
✓ Colombia	✓ Colombia	✓ Turkey
✓ Brazil	✓ Brazil	✓ Kenya
✓ India	✓ India	✓ Sweden
✓ Pakistan	✓ Pakistan	✓ Czech Republic
✓ Turkey	✓ Turkey	✓ United Kingdom
✓ Russia	✓ Azerbaijan	✓ France
✓ Azerbaijan	✓ Egypt	✓ Lithuania
✓ Egypt	✓ Kenya	✓ Estonia
✓ Indonesia	✓ Sri Lanka	✓ Germany
✓ Vietnam	✓ Ethiopia	✓ Austria
✓ Kenya	✓ Kazakhstan	
✓ Sri Lanka	✓ Nigeria	
✓ Denmark	✓ Uganda	
✓ Sweden	✓ Ukraine	
✓ United Kingdom	✓ Vietnam*	
✓ France	✓ Argentina*	
✓ Germany	✓ Indonesia*	
✓ Austria		
✓ Italy		
✓ Greece		
✓ Finland		
✓ Norway		
	*in process	

List above is not intended to be comprehensive, for discussion purposes only

Type approval - country regulator has an established device type approval process before a device can be activated on network

IMEI Requirement & Validation - country has some form of IMEI validation, could be basic IMEI check or full device registration and blocking

IMEI Tampering Laws - country has laws criminalizing the tampering and/or modification of a device's IMEI with some including jail time

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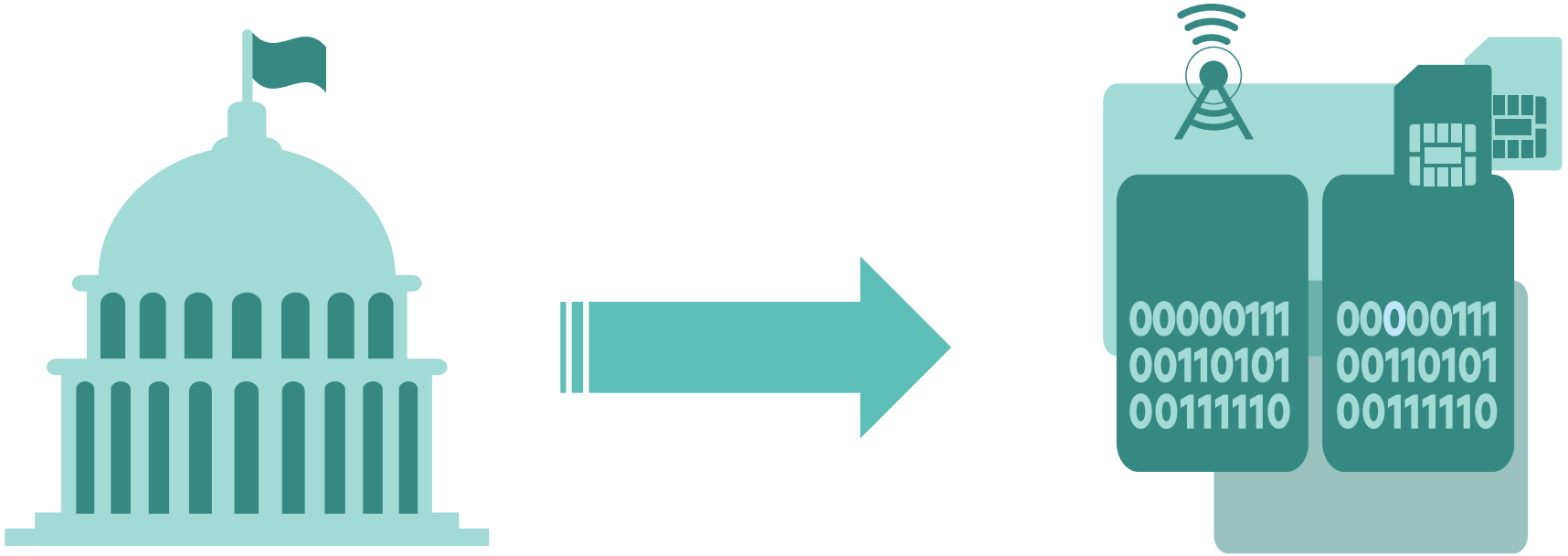
Required Elements to address Counterfeiting & Theft



1. Government Regulations & Enforcement
2. Technical Platform Deployment

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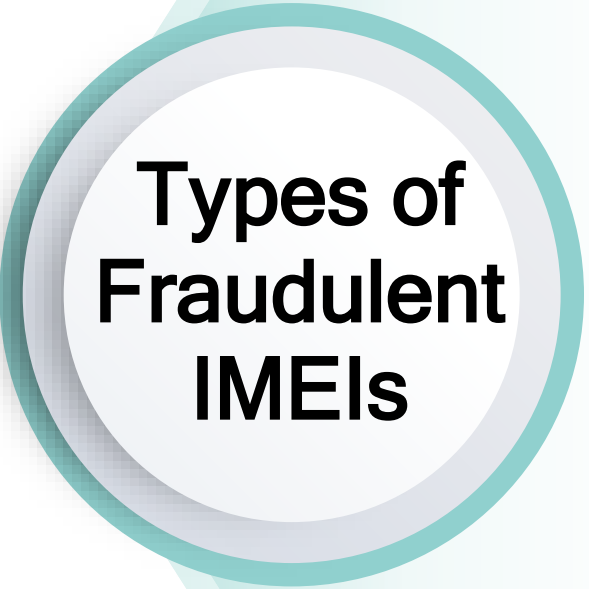
Multiple IMEI related issues impacting the stakeholders



Malformed IMEIs

Do not meet format requirements

MNV12KvuGS8WRTY
1122334455667788
11111

Misused IMEIs

Old TAC used on a newer device

491234567891234

Invalid IMEIs

Not allocated by the GSMA

351234567891234

Transient IMEIs

Equipment constantly changes IMEIs

Duplicate IMEIs

Same IMEI cloned on multiple devices

356938035643809
356938035643809
356938035643809

Non-Approved IMEIs

Non-homologated/Type Approved
Illegal imported

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Multiple IMEI related issues impacting the stakeholders

Types of Fraudulent IMEIs

1 IMEI associated to multiple MSISDNs

1 IMEI to # of MSISDNs	IMEI #	% in total IMEIs	Associated MSISDN #	% in total MSISDNs
2	6, 844, 154	82. 38%	13, 688, 308	46. 68%
3	766, 402	9. 23%	2, 299, 206	7. 84%
4	252, 352	3. 04%	1, 009, 408	3. 44%
5	122, 110	1. 47%	610, 550	2. 08%
6	70, 169	0. 84%	421, 014	1. 44%
7	45, 941	0. 55%	321, 587	1. 10%
8	32, 802	0. 39%	262, 416	0. 89%
9	24, 353	0. 29%	219, 177	0. 75%
10	19, 333	0. 23%	193, 330	0. 66%
(10,20]	72, 089	0. 87%	1, 019, 234	3. 48%
(20,50]	37, 201	0. 45%	1, 153, 778	3. 93%
(50,100]	12, 582	0. 15%	869, 787	2. 97%
(100,200]	5, 110	0. 06%	707, 374	2. 41%
(200,500]	2, 322	0. 03%	676, 752	2. 31%
(500,1000]	499	0. 01%	343, 287	1. 17%
(1000,10000]	337	0. 00%	801, 569	2. 73%
(10000,50000]	26	0. 00%	568, 909	1. 94%
(50000,100000]	4	0. 00%	290, 205	0. 99%
(100000,)	8	0. 00%	3, 867, 261	13. 19%
Total	8, 307, 794		29, 323, 152	

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Problem Continues Despite Industry's Actions

Operators actions are generally limited to blocking stolen IMEIs

Mobile Operators

Specifications / Standardization

3GPP has identified device authentication as an issue: SMARTER Study Item (sec 5.63.3) and SA3 Key Issue #2.4 in TR 33.899

Multiple proposals submitted; MMF Requested to take the SI forward as a WI for Rel 15

Market Surveillance / Law Enforcement

Solution?

Network Access Control under the Government Mandate

Control at Source / Export Points

GSMA, MWF, Qualcomm presented and discussed the issue at a workshop for China Customs

Blacklisting; IMEI Training; DSG Initiatives for IMEI security and strengthening

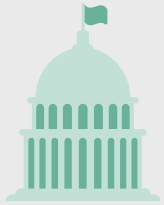
Device Security / IMEI Strengthening

Control at Import Points / Customs

IPM THE WCO TOOL IN THE FIGHT AGAINST COUNTERFEITING

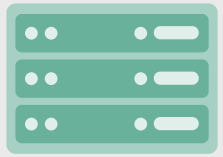
Regulatory Framework for Combatting Counterfeiting & Device Theft

Key Elements of the Framework



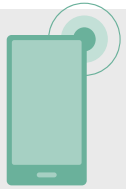
Requiring Type Approval

- Ensures device authenticity and standards conformance



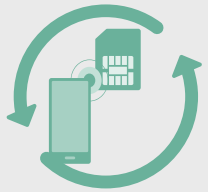
Mandating Device Registration

- Ensures IMEI uniqueness
- Curbs counterfeiting
- Eliminates illegal import
- Allows for blocking of stolen devices



Providing Verification Systems

- Mechanism for users to verify device status and its authenticity



Granting Amnesty

- Allowing existing fraudulent devices to operate on the networks before phasing them out

Reporting Lost/Stolen Devices

- Mechanism to report lost and stolen devices to allow for network blocking

Mandating Device Blocking

- Mandate operators to block non-conforming, illegal and stolen devices using their EIRs

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Stakeholders Roles & Responsibilities

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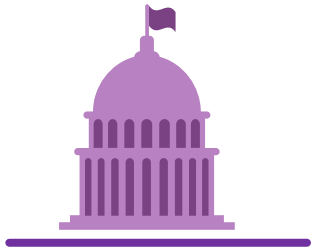
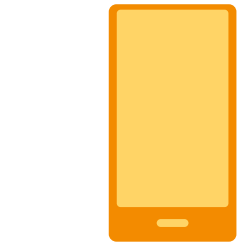


Government

- Develop Regulatory Framework for device registration and blocking of Non-approved, Illegal and Stolen devices
- Implement Standard Operating Procedure
- Deploy and Administer a technology platform to enforce regulations



Manufacturers / Importers

- Obtain Device Type Approval from the Government / Regulator
- Register all devices to be imported
- Register all locally manufactured devices

Operators

- Provide Device related Network Data to the government
- Ensure EIRs support Blacklisting of valid & invalid IMEIs and Device Pairing
- Notify subscribers of their device status via SMS as required

Consumers

- Verify Device authenticity via SMS, App, Web
- Register individually imported device(s)
- Report Device Theft to authorities
- Submit proof (invoice) for Genuine Devices, if required

Technical Framework for Combatting Counterfeiting and Mobile Theft

1. Classify Existing Devices	2. Allow All Existing Devices	3. Register New Devices	4. Detect IMEI Falsification	5. Enable Network Blocking
• Analyze device data from network information • Classify devices by their IMEIs (valid / invalid, unique / duplicate)	• Pair existing fraudulent IMEIs with IMSIs	• Require Type Approval with unique device identifiers • Register imported & locally produced devices with valid and unique identifiers only	• Analyze network data • Identify devices with fraudulent IMEIs	• Control access of devices - that do not have certification or are not registered - through network control

This Frameworks Curbs Counterfeits, Mobile Theft and Illegal Imports (Smuggling) and Benefits the Entire Ecosystem

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Considerations for Technical System Implementation

- Convenient for all stakeholders, especially the consumers
- Not requiring strict binding of every single device to a given customer
- Flexible/Configurable to adapt to local country regulations without the need for any customization
- Standalone system alleviating the need for mobile network integration and interoperability that cause unnecessary cost, capacity constraint and resource burden on the operators
- Provides tools for users to check device validity before purchase

Qualcomm Has Developed a Technology Platform to Address the Issue

DIRBS: Device Identification, Registration, and Blocking System

DIRBS addresses fraudulent IMEIs, illegal and stolen devices and provides for device access control

- Allows for identification of all devices
- Verifies installed base of devices
- Monitors all new device activations
- Addresses illegal devices
- Allows for exceptions/amnesty and continuation of illegal/fraudulent existing devices already in the country

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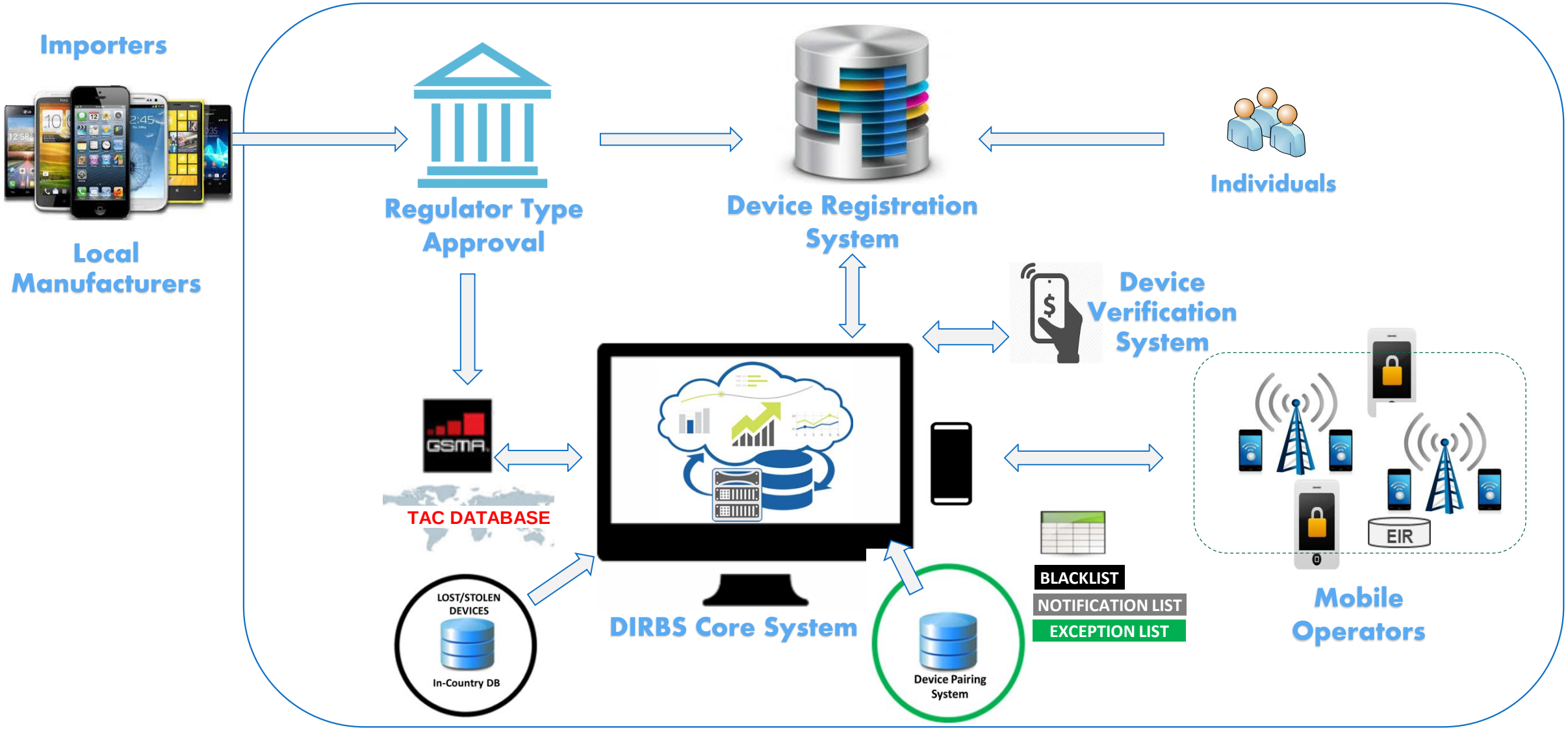
DIRBS: Device Identification, Registration & Blocking System



DIRBS Going Open Source

DIRBS Open Source Project

- DIRBS Open Source Project to provide free DIRBS software including the source code
- DIRBS Open Source Software to be available in Public Domain

DIRBS Deployment

- Governments deploy DIRBS platform through in-house experts or through outsourcing the implementation to third parties

DIRBS Operation

- Governments in charge of the Software, System Operation and Maintenance of the DIRBS Platform
- Operators maintain their EIR Operations

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Summary of Device Legislation and Regulation in Pakistan

Since 2006

IMEI Network Blocking of lost or stolen mobile devices has been in place in Pakistan

June 2016

Consultation Document issued by the Pakistan Telecommunication Authority (PTA) on a proposed Device Identification, Registration and Blocking System (DIRBS)

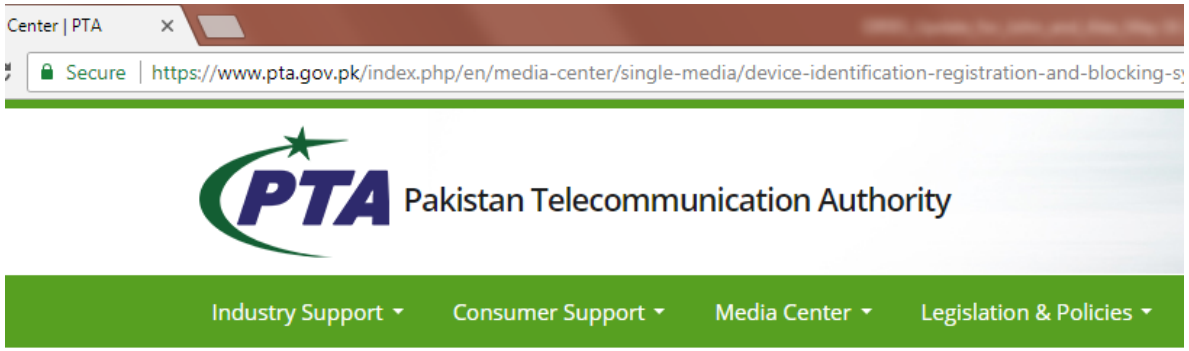
Since 24th August 2017

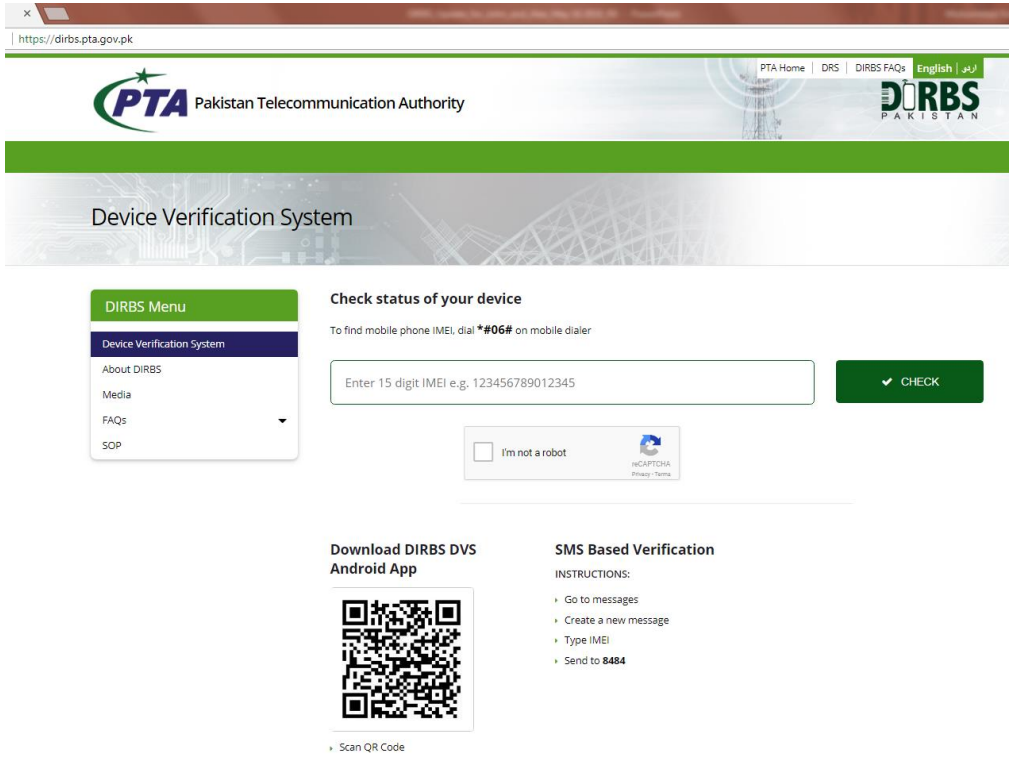
Mobile Device Identification, Registration and Blocking Regulation has been in place

Scope and Applicability of the Regulations:

- Apply to all MNO(s), Type Approval Holders; Authorized Distributors and OEM/ODM for registration and maintenance of accurate data of mobile device(s) and IMEI(s),to ensure the sale, purchase and provision of mobile communication service(s) to Compliant Mobile Device(s) only, through DIRBS System
- All Type approval holders/authorized distributors/OEM/ODM and Mobile Network Operators(MNOs) shall co-operate with the Authority to ensure that non-compliant mobile devices are not imported, sold, marketed or connected with the mobile operators' networks.
- Mobile devices reported as stolen, blocked or bearing a duplicate or non-standard IMEI shall be blocked by MNO(s)

DIRBS OFFICIALLY LAUNCHED IN PAKISTAN!





Press Release

May 10, 2018

DEVICE IDENTIFICATION REGISTRATION AND BLOCKING SYSTEM (DIRBS) LAUNCHED AT PTA

Islamabad: In line with the Telecom Policy 2015, Pakistan Telecommunication Authority (PTA) launched Device Identification, Registration and Blocking System (DIRBS) in collaboration with 3G Technologies today here at PTA Headquarters Islamabad. Chairman PTA Mr. Mohammad Naveed was the chief guest while Mr. Abdul Samad, Member Compliance and Enforcement PTA, Executive Director, 3G Technologies, IT and telecom industry experts, CEOs of telecom companies, representatives from FBR and media community attended the event. Member Compliance & Enforcement gave presentation on DIRBS during the event.

Indonesia

Coil
Saturday 08 April 2017 - 19:09

Government Cooperate with Qualcomm to Fight Illegal Mobile Phone

The government through the Ministry of Industry plans to hold Qualcomm, a technology company from the United States to identify mobile phones that will enter or have existed in Indonesia. The goal is to monitor all phones with mandatory registration process type and product identity number.

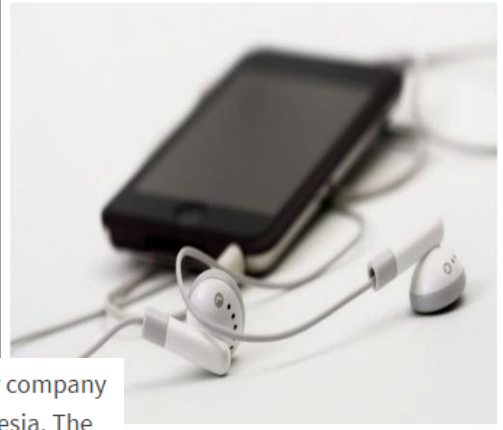
Minister of Industry Airlangga Hartarto explained, the identification starts from the examination of the number listed on International Mobile Station Equipment (IMEI) in the mobile device.

KOMPAS.com NEWS ECONOMICS BALL TECHNO ENTERTAINMENT AUTOMOTIVE LIFESTYLE PROPERTY

Economics / Macro

Fight Illegal Mobile Phone, Ministry of Industry and Qualcomm Will Monitor Import Process

SAKINA RAKHMA DIAH SETIAWAN
Kompas.com - 08/04/2017, 21:49 WIB



netral english
People's Reflection

HOME NEWS BUSINESS INTERNATIONAL SPORT LIFESTYLE TOURISM & CULTURE OPINION

Gov't Teams up with Qualcomm Eradicating Illegal Mobile Phones

Sunday, 09 April 2017 | 10:22 WIB

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Various models of smartphones (Special)

JAKARTA, NETRALNEWS.COM - The Ministry of Industry participates actively in impeding imports and combating the circulation of illegal mobile phones in an effort to protect the security of domestic industry and consumers.

One of the strategic steps that need to be done is to monitor the entire phone with mandatory

July 23, 2018

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Contact:

Mohammad Raheel Kamal
Senior Director
Qualcomm Technology Licensing
mkamal@qualcomm.com

Chair: Counterfeit & Security Working Group (MWF)
Chair: Joint Device Identification Taskforce (GSMA / MWF)

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