

DIRBS CEIR

The Open Source CEIR
addressing
Counterfeit, Stolen & Illegal Mobile Devices

Mohammad Raheel Kamal



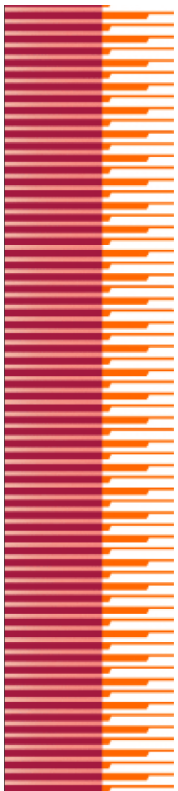
DIRBS



DIRBS CEIR is open-source software platform available on GitHub.



<https://github.com/dirbs>



International Telecommunication Union

ITU-T
TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

WORLD TELECOMMUNICATION STANDARDIZATION
ASSEMBLY
Hammamet, 25 October – 3 November 2016

**Resolution 90 – Open source in the ITU
Telecommunication Standardization Sector**

In accordance with:

- Resolution 90 (WTSA-16) “Open source in the ITU Telecommunication Standardization Sector” encouraging the use of open-source projects
- Recommendation ITU-T Q.5050 “Framework for solutions to combat counterfeit ICT devices”

The Issues Faced by the Industry

Governments and the industry are motivated to address and control a wide range of issues including:



Mobile Theft



Security



Revenue Loss



**Consumer
Privacy**



**Network
Quality**



**IPR & TM
Infringement**

A combination of regulatory framework and technical system implementation is required to overcome these issues.

Device Identification, Registration, and Blocking System (DIRBS)

Helping the industry in the fight against mobile fraud

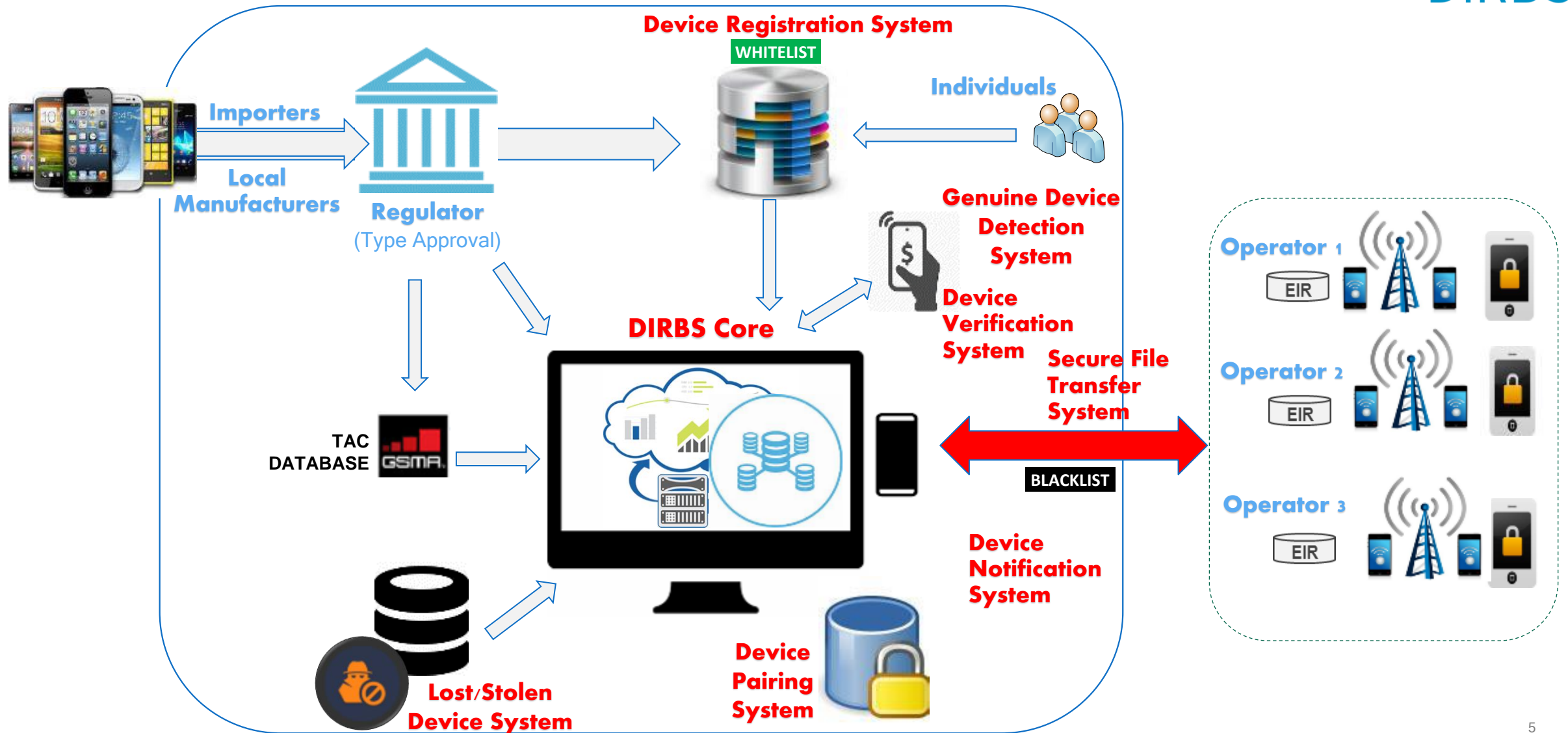


DIRBS

DIRBS is an open-source software platform that helps address issues associated with counterfeit, illegal & stolen devices.

DIRBS CEIR

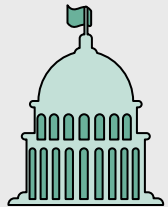
Supports both Realtime (Whitelist) and Offline (Blacklist) Modes



Deploying the System

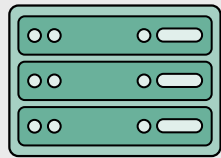
- Regulatory Framework
- Technical Framework
- Public Consultation
- Awareness Building
- Technology & Platform Selection
- System Customization, Implementation, and Integration
- Operations, Analytics & Reporting

Regulatory Framework - Key Elements



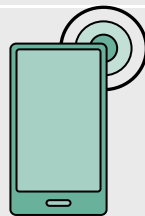
Type Approval

- Ensures device authenticity and Standards conformance



National Device Registration

- Ensures IMEI uniqueness; Eliminates illegal import



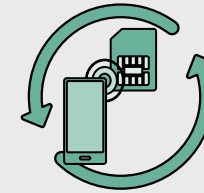
Laws against IMEI Tampering

- Criminalize changing / reprogramming IMEIs



Availability of Device Data

- Access to device data from the mobile networks



EIR Deployment

- EIR deployment for blocking and amnesty



Device Blocking

- Mandate to block non-compliant, illegal, and stolen devices

Technical Framework - Key Elements

Classify Existing Devices

- Classify devices by their IMEIs (valid / invalid, unique / duplicate) by analyzing device data from mobile networks

Allow All Existing Devices

- Grant amnesty and pair existing fraudulent IMEIs with IMSIs and MSISDNs

Register All New Devices

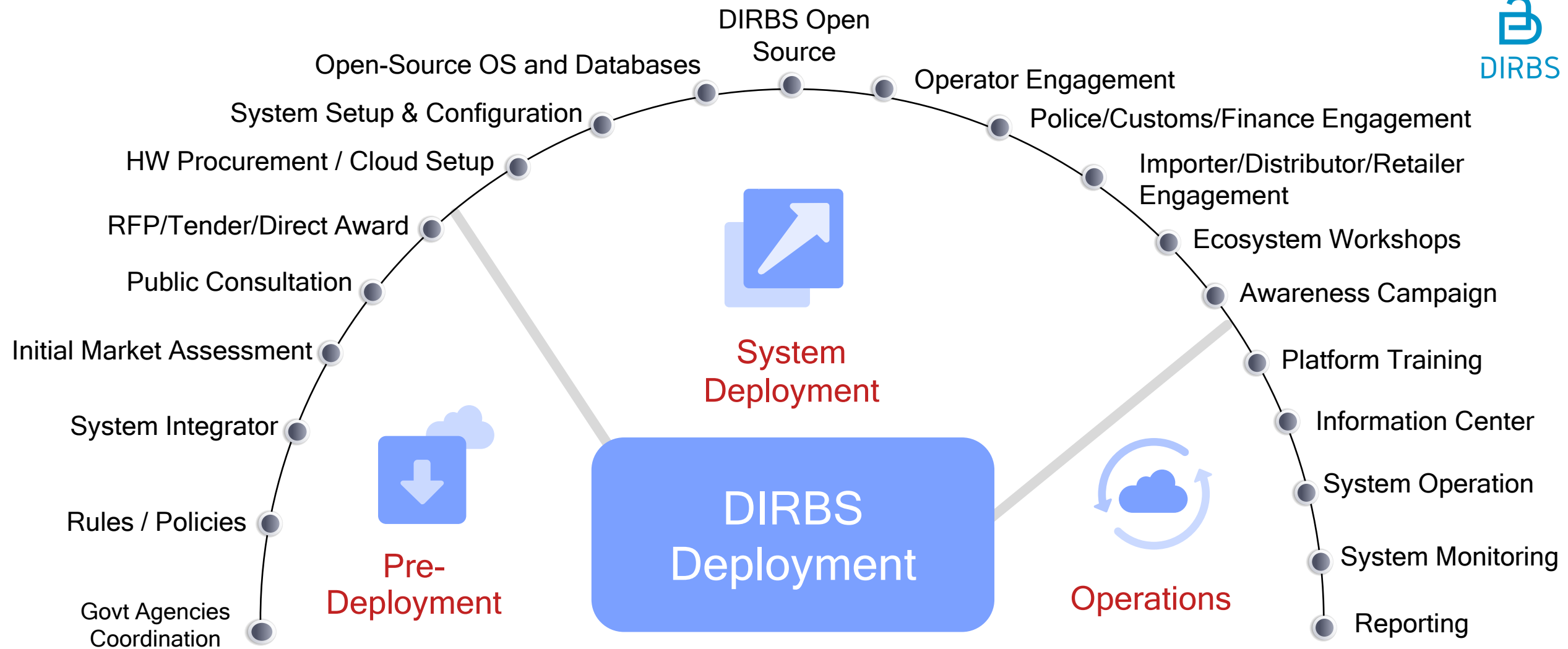
- Register all future devices in a national device registry database

Detect IMEI Falsification

- Detect devices with fraudulent IMEIs by analyzing device data from mobile networks

Enable Network Blocking

- Control device access of non-compliant and non-registered devices



DIRBS Implementation Framework

DRS (Device Registration Subsystem)

(1/2)

DIRBS View

Dashboard / DRS

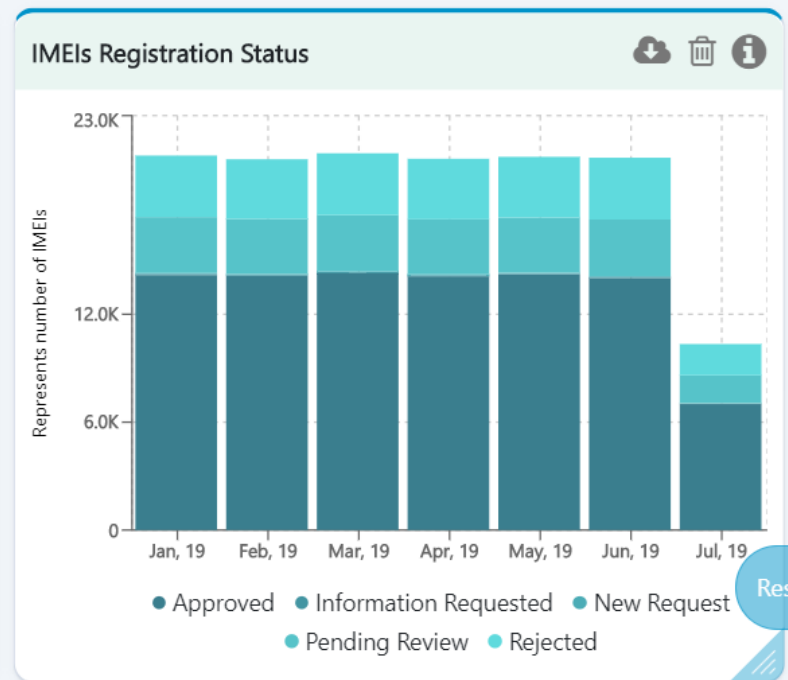
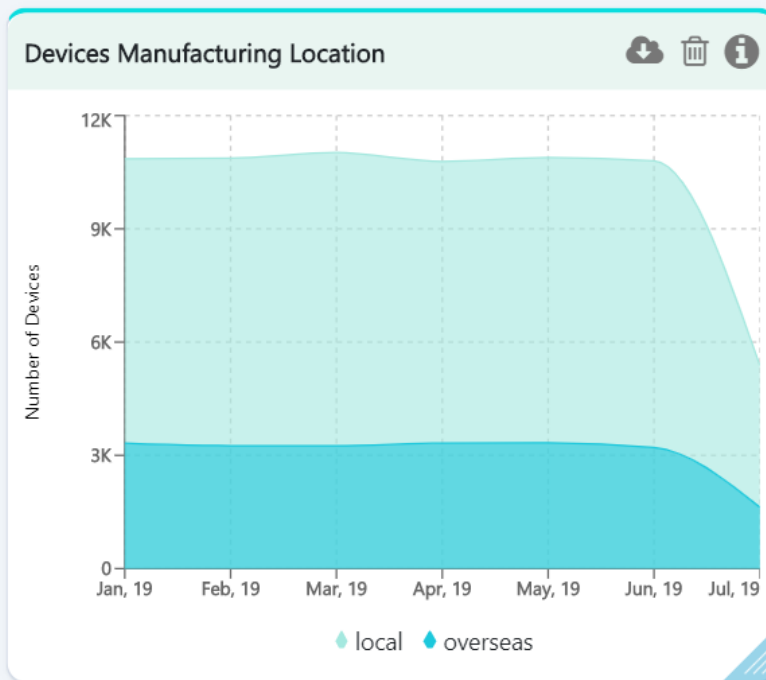
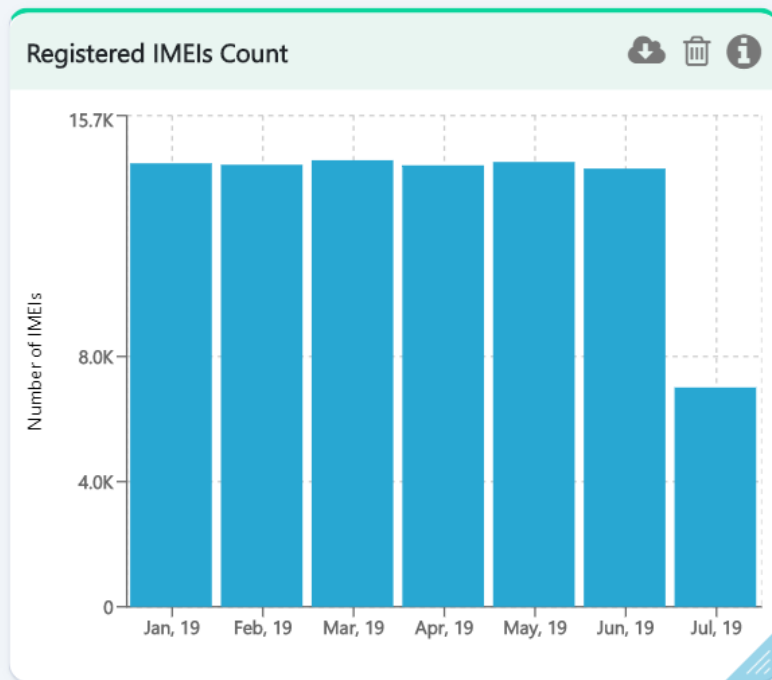


Applied Filters:

Granularity: **monthly**

Date Range : 2019-01-01 - 2019-09-25

Trend Quantity : 5



Reset

DRS (Device Registration Subsystem)

(2/2)

DIRBS View

Applied Filters:

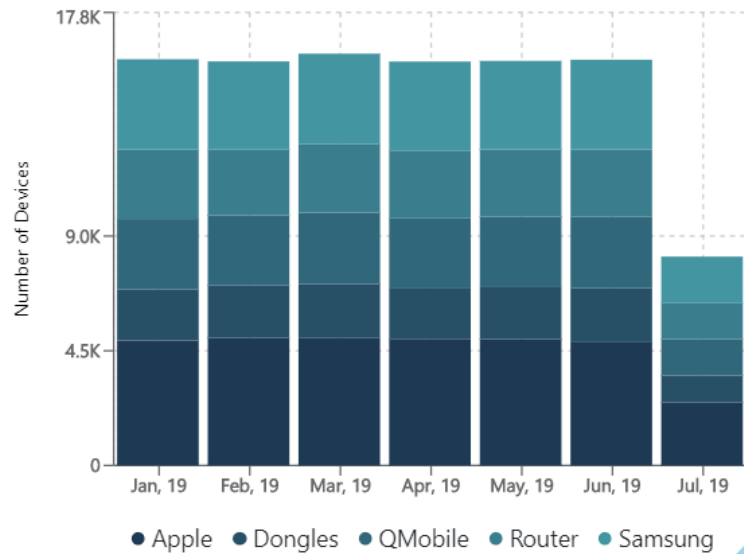
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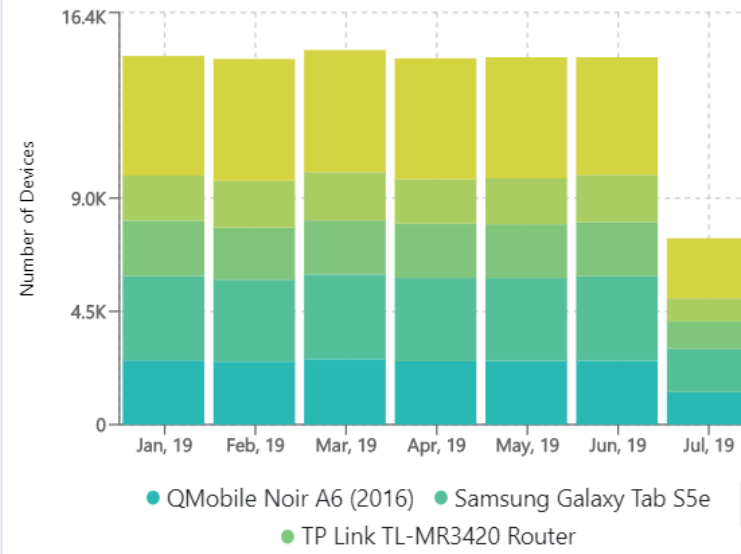
Trend Quantity : 5



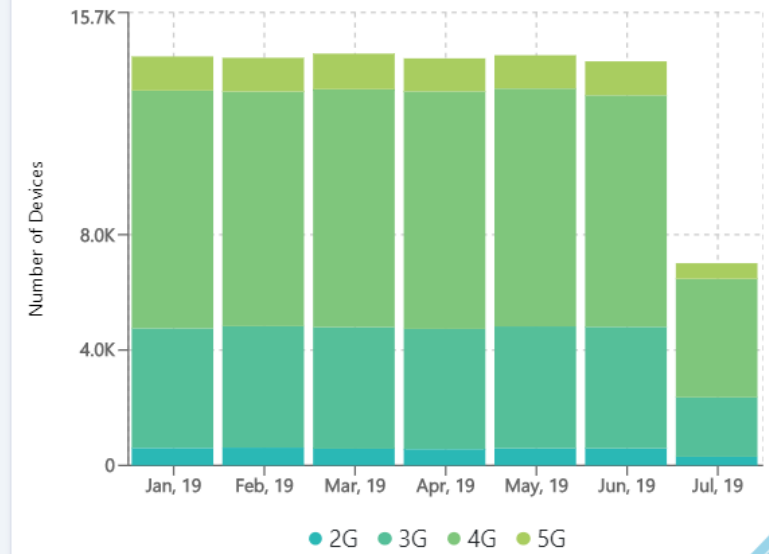
Top Registered Brands



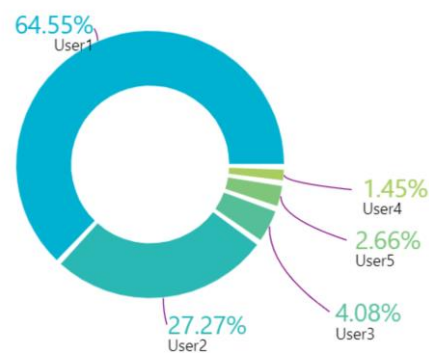
Top Registered Models



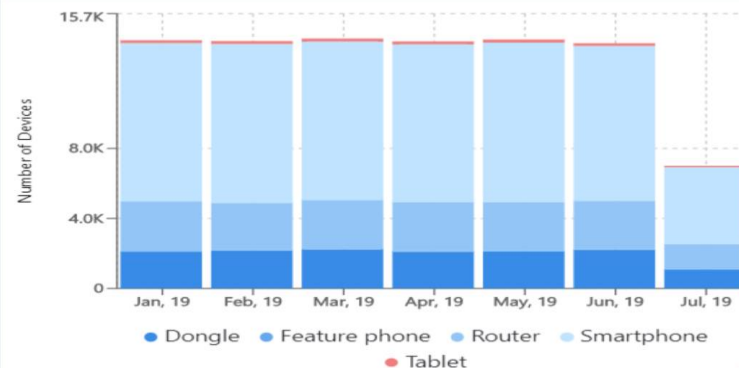
Device Technologies



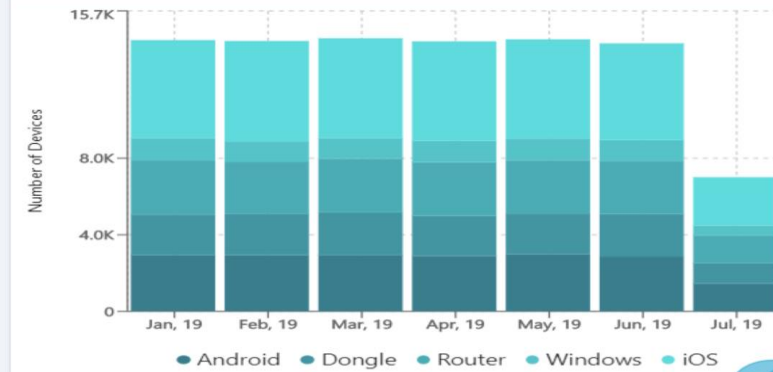
Device Top Importers



Types of Registered Devices



Devices Operating System



DIRBS Dashboard

DIRBS View

Total IMEIs
2,683,996
Monthly Average
113,990 | ↑ 1.06%

Total Valid IMEIs
909,220
Monthly Average
35,707 | ↓ 0.31%

Total Invalid IMEIs
1,774,776
Monthly Average
78,284 | ↑ 1.68%

Total Paired IMEIs
1,232,515
Monthly Average
12,338 | ↑ 2.51%

Total Stolen Devices
1,662,772
Monthly Average
16,622 | ↓ 1.28%

Total Registered IMEIs
1,409,746
Monthly Average
14,144 | ↓ 1.88%

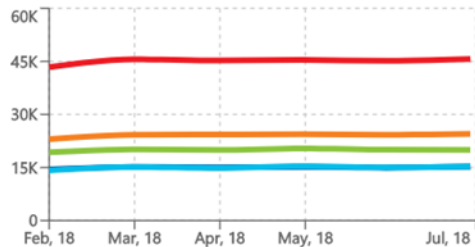
Operator Wise IMEIs

2.87M

- Operator1 1,164,811
- Operator2 565,767
- Operator3 445,953
- Operator4 303,102
- Operator5 302,492



Operator Wise Trend

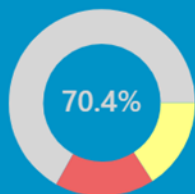


Total IMEIs

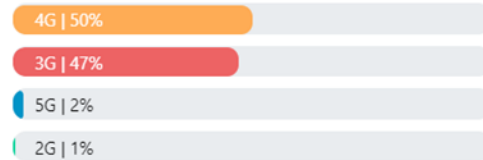
1.85M

May 20.6K | Jul 20.5K | Jun 20.7K

Approved Devices | 97.2K



Registered Device Technology



Pairing Types

- Primary 293,971
- Secondary 938,544



Operator's Active Pairs

- Operator1 294.5K
- Operator2 293.6K
- Operator3 292.4K
- Operator5 291.1K



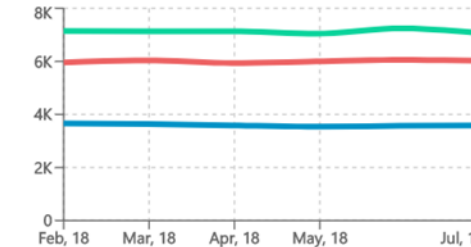
Lost/Stolen Device Status

1.66M



- Pending
- Recovered
- Blocked

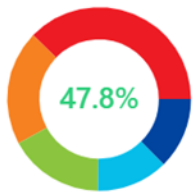
Lost/Stolen Device Trend



Operator Wise Blocking

1.37M

- Operator1 519,208
- Operator2 278,368
- Operator3 230,718
- Operator4 173,638
- Operator5 172,845

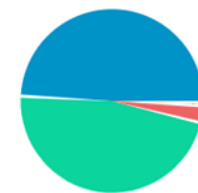


Top Registered Brands

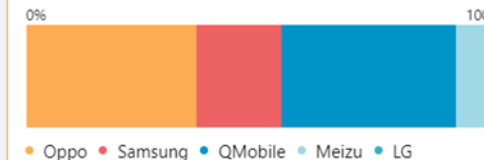


Pairs Classification

- Permanent 1,231,950
- Active 1,171,636
- Deleted 60,879
- Temporary 565



Most Stolen Brands



LSDS (Lost / Stolen Device Subsystem)

DIRBS View

Dashboard / LSDS

Reported Devices
1,662,772

Stolen Devices
1,410,984

Lost Devices
248,429

Recovered Devices
596,681

Pending Devices
712,169

Blocked Devices
350,436

Applied Filters:

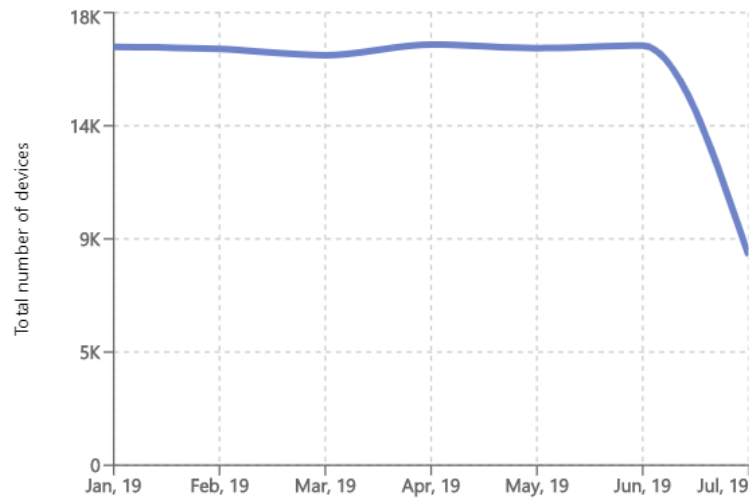
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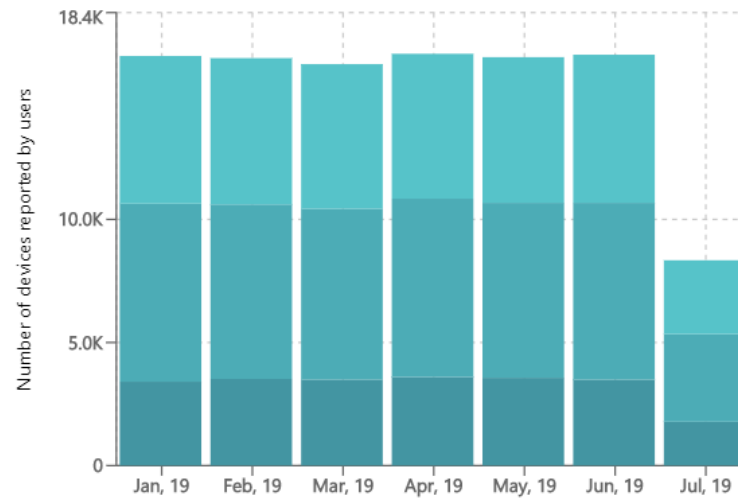


Number of Reported Devices



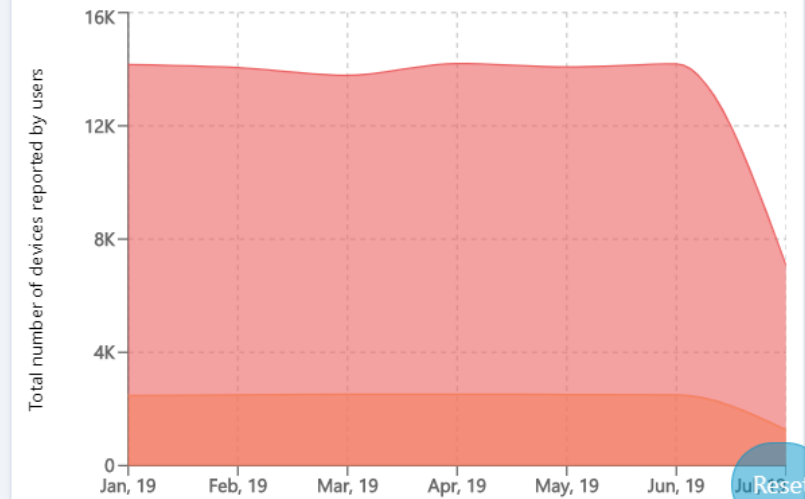
▲ unique_devices

Status of Reported Devices



● Blocked ● Pending ● Recovered

Incident Nature of Reported Devices



◆ Lost ◆ Stolen

Reset

Why Open Source DIRBS CEIR



The most successful proven CEIR deployment in the world!

Quick Cloud-based or On-site deployment

Real-time or Offline system implementation

Fully transparent with source code availability

Configurable & fully customizable to adapt to local country regulations

Comprehensive data analytics and reporting

Independent subsystem deployments option with modular approach

Official Results of Pakistan DIRBS Deployment (Device Blocking)



Search www.pta.gov.pk

Industry Support ▾

Consumer Support ▾

Media Center ▾

Legislation & Policies ▾

Data & Research ▾

Determinations ▾

PTA-GSMA Courses ▾

Pakistan has the distinction of implementing the world's first open-source, full-fledged DIRBS. This system has the ability to identify all IMEIs latched on Pakistan's mobile networks and to categorize them based on their compliant status.

24M

Counterfeit
Devices Blocked

675K

Duplicated / Cloned
IMEIs Blocked

175K

Stolen Devices
Blocked

Official Results of Pakistan DIRBS Deployment (Import Revenues)



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Legislation & Policies ▾

Data & Research ▾

Determinations ▾

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17M (2018)
→ **28M (2019)**
→ **33M (2020)**
Legal Device
Imports

US \$141M (2018)
→ **US \$577M (2019)**
Commercial Device
Import Revenues

US \$0M (2018)
→ **US \$57M (2019/20)**
Individuals Carry-on
Device Revenues

Official Results of Pakistan DIRBS Deployment (Local Mobile Assembly)



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Media Center ▾

Legislation & Policies ▾

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33

Local Mobile
Assembly
Plants

25M

Local
Devices
Assembled

119K (2019) →

2.1M (2020) →

1.2M* (2021)

(*in just two months Jan-Feb 2021)

Smartphones Assembled

Official Results of Pakistan DIRBS Deployment (Local Mobile Manufacturing)



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19

Mobile
Manufacturing
Authorizations

2G/3G/4G

For Import & Export

‘Manufactured in Pakistan’

10

Valid for Next
10 Years

DIRBS boosting country's economy and creating jobs

Strategy Analytics: Pakistan Emerges as Smartphone Production Hub

← → ↻ 🏠 <https://www.strategyanalytics.com/access-services/devices/mobile-phones/emerging->

STRATEGYANALYTICS BUSINESS SOLUTIONS ▾ INDUSTRY EXPERTISE ▾ SYNDICATED RESEARCH ▾ COMPANY

Market Data Reports Dashboards Videos Complimentary About

Pakistan Emerges as Smartphone Production Hub

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Author: [Neil Mawston](#)
Publication Date: Mar 11 2021
Pages: 5
Report Type: Insight, Word

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Report Summary:
Pakistan is quietly emerging as a regional smartphone manufacturing hub in Asia. Vivo and others are opening plants there. Will production move from India?

Table of Contents

1. Introduction
2. Analysis
3. Conclusions
4. Contacts

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Thank You!

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