

CORPORATE PROFILE

PRESENTATION | 2020

Your Name



MOBILEUM: A GLOBAL MARKET LEADER IN THE AREAS OF ROAMING, NETWORK SECURITY & RISK MANAGEMENT



Customers

750+

In more than 150 Countries
Over 3 in 4 operators
use Mobileum!



Innovation in DNA

230

Patent applications
110 awarded



KEY SOLUTION AREAS



**Roaming
& Network
Services**



**Revenue
Assurance
& Fraud Mgmt.**



**Network
Security**



**Business
Operations Mgmt.**

Industry influence

GSMA, CFCA,
BEREC, ETIS, RAG

IR.81, FS.20
Standards Co-authorship



Global campus

USA HQ

Amman, Bengaluru, Braga, Bristol,
Buenos Aires, Dubai, Gurgaon, Hong
Kong, Lisbon, Mumbai, Singapore



Leading market position

Roaming Analytics Vendor
Network Security Vendor
Revenue Assurance Vendor
Fraud Management Vendor

HIGHLY RECOGNIZED BY THE MARKET AND BY ITS CUSTOMERS



2018 Leading Steering of Roaming Vendor MNO quote: “They are innovators & this is what MNO’s need in this space”

2018 Leader in innovation MNO quotes: “They are the ones to follow, passionate about our industry’s future”, “There is no one who doubts they are innovative & often find unique solutions through their research”

Global Financial Assurance Leader Analyst quote: “a consistently strong performer in the fraud, revenue and business assurance market”

#1



Leader in Innovation
Leading provider for **Steering of Roaming**

Leading provider for **IRSF prevention solutions**

Leading provider for **Roaming Quality Testing Solutions**

#1



Telecom roaming test and security
Global
Price/Performance
Value Leadership

Financial Assurance
for the Overall
Revenue Assurance
Market Leadership
Top Ten to Watch



Mobileum’s signaling firewall as the Security Solution of 2019



Most Innovative Blockchain for Telecom



GSMA MWC Award (2019 Finalist)



Sample vendor in Gartner hype cycle for data science and machine

Sample vendor in Maximizing the Value of Analytics, Artificial Intelligence and Automation in CSP Fraud Management

MOBILEUM IS PART OF AUDAX GROUP PORTFOLIO, A US MIDDLE MARKET PE LEADER



Established Leader with Differential Resources

30+
years of
experience
(senior team
members)

30
Managing
Directors
(average 15
years at Audax)

240+
employees
(across 3
offices:
BOS/NY/SF)



**Experienced
Team**



**Middle
Market
Platform**

Private Debt
(\$10MM-\$50MM EBITDA)
Senior Debt
Unitranche
Mezzanine

Private Equity
(\$10MM-\$40MM EBITDA)

\$24+
billion of
capital
raised

\$2
billion of GP
& affiliate
commitments

220+
middle
market
companies
in portfolio



**Substantial
Capital**



**Extensive
Relationships**

1.500+
deal sources

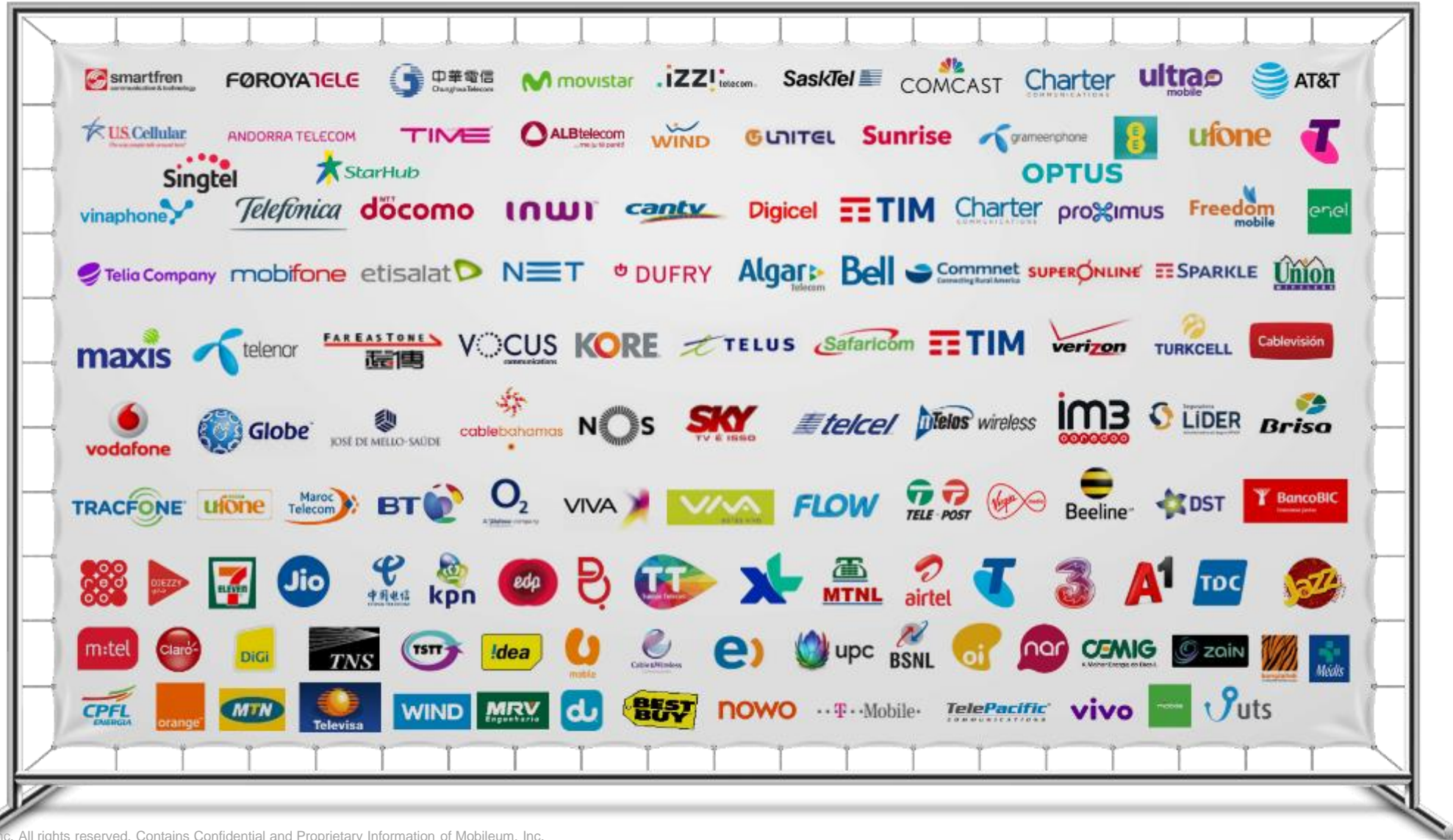
100+
lead lender
partners

300+
middle market
PE sponsor
relationships

Legal, accounting,
consulting, executive
search, insurance, etc.

\$24+ billion of capital includes \$17.1 billion of investor equity commitments, \$2.1 billion of Audax commitments, and \$5.5 billion of existing/anticipated leverage on Senior Debt vehicles

A GLOBAL FOOTPRINT OF 750+ CUSTOMERS...



TELECOM INDUSTRY IS FACING A DEEP TRANSFORMATION



INDUSTRY DRIVERS

- Technology Transformation
 - 5G
 - NFV
 - IoT
 - Cloud
 - VoLTE
- Increased **Financial Pressure**
- Tighter **Regulation**
- Digital **Agenda**



INDUSTRY CHALLENGES

- **Monetization** of New Business Models
 - B2B2X
 - Tiered Pricing
 - New vertical approaches
 - Slicing and MVNOs
- Increase **Revenue**
- Decrease **Costs**
- Enhance **Experience**
- Operational **Efficiency**

OUR ACTIVE INTELLIGENCE™ PLATFORM HELPS CUSTOMERS DEAL WITH THE EMERGING INDUSTRY CHALLENGES & OPPORTUNITIES

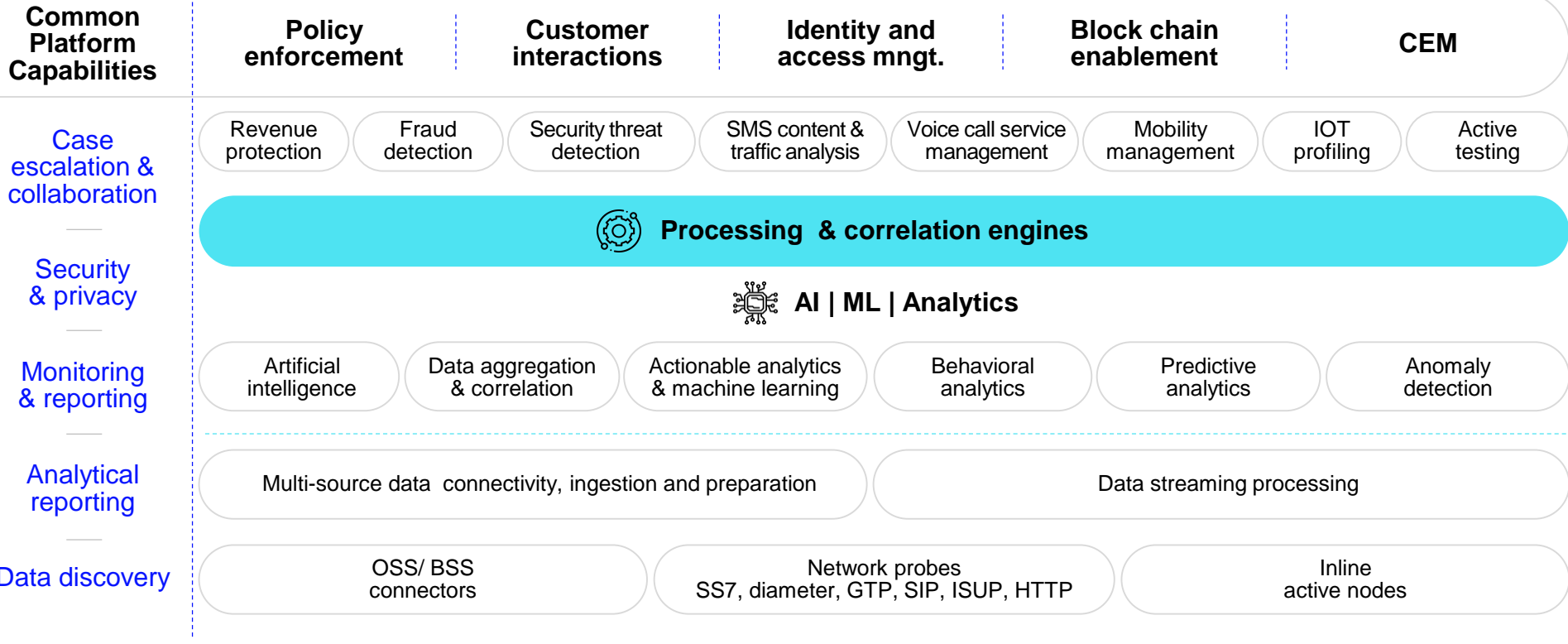


roaming intelligence

security intelligence

fraud & risk intelligence

business process intelligence



Close the loop

Drive insight (Apps)

Aggregate & correlate

Transform & enrich

Collect & ingest

Technology domains



Delivery models



On-prem



Private clouds

Hybrid cloud

Public clouds



Managed services

WE HAVE A COMPREHENSIVE PORTFOLIO OF SOLUTIONS BUILT ON TOP OF ACTIVE INTELLIGENCE™ PLATFORM



Roaming Intelligence

Experience

Roaming Customer Experience Management
Active Testing

Retail Roaming

Customer and Retail Analytics
Data Management
iCampaign

Wholesale Roaming

Steering of Roaming
Wholesale Business Advisor

Network Services

Roaming Hubs
GTP Proxy
Virtual Home Environment
Smart Mediator
IoT Packet Printing



Business Management

Credit Control and Collections

Incentives Management

ACTIVE INTELLIGENCE PLATFORM



Security Intelligence

Cross-protocol Signaling Firewall

A2P SMS Grey Route Protection

SMS Spam Protection

Penetration Testing

Network Threat Prevention

Traffic Anomaly Detection



Fraud & Risk Intelligence

Fraud Management

Roaming Fraud

Bypass Fraud

Revenue Share Fraud

SIP & VoIP Fraud

Subscription Fraud

Dealer Fraud

OTT Bypass Fraud

Data Fraud

Content Fraud

Revenue Assurance

Usage Assurance

Provisioning Assurance

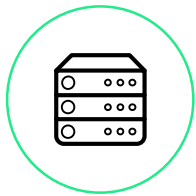
Rating & Billing Validation

Prepaid Balance Validation

Business Assurance

Margin Assurance

AND A FLEXIBLE CATALOGUE OF SERVICES AND DEPLOYMENT MODELS



On-Prem



Private Cloud



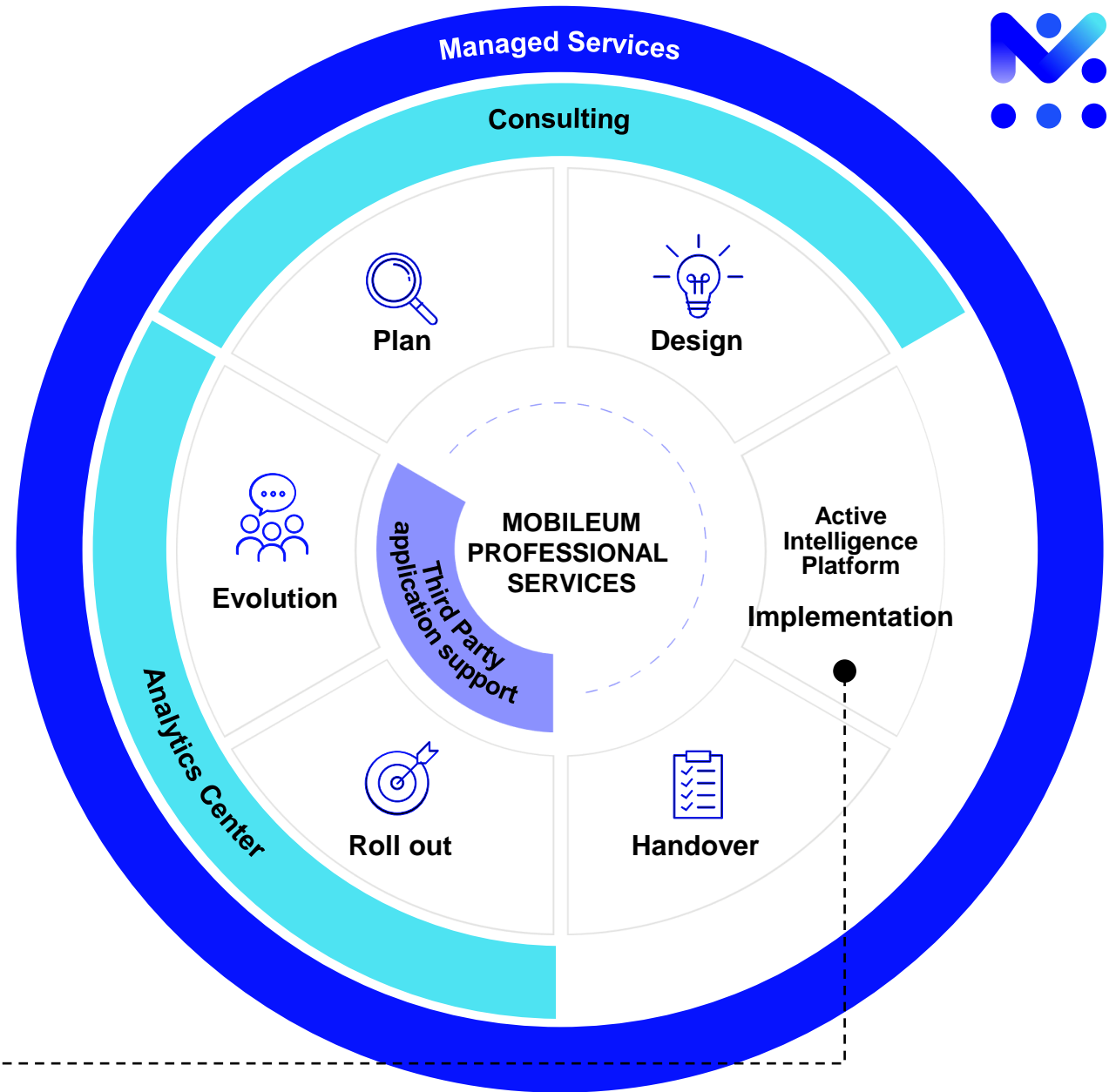
Hybrid Cloud



Public Cloud

24 x 7 x 365

“Follow The Sun” support model



WE HAVE BUILT A UNIQUE VALUE PROPOSITION



P A S T

P R E S E N T

Telecom Analytics
framework that
links insights with action



01

From Roaming Connectivity and Partner Network Management

To... Monetization
» Improvement in Customer Experience
Value generation across services

02

From Security Threat Detection

To... Integrated real time security response and protection... Through automation

03

From Revenue Assurance Reporting

To... Proactive business optimization
» Automatic response to remediation

04

From Fraud Prevention & Detection

To... Automated blocking
» Integrated real time business response

PRODUCTS READY TO TACKLE KEY INDUSTRY HOT TOPICS



 **roaming**
intelligence

verizon^v

Roaming
CEM

 Deutsche
Telekom

Wholesale
Business
Advisor

IoT Packet
Printing

 **security**
intelligence

 T-Mobile

Cross-Protocol
Signaling Firewall

OPTUS

A2P SMS Grey
Route Protection

 **fraud & risk**
intelligence

 vodacom

Subscription
Fraud

 BT

Billing & Rating
Validation

 **business operations**
intelligence

 du

Collections
Management

 entel

Incentives
Management

stc

Signaling based Real-Time Fraud Prevention
(including, Robocalling / IRSF / Wangiri / CLI
Spoofing / FAS / CS / SIM Box)

HOW DO WE DO IT FOR ROAMING?



Collect & Ingest

Aggregate & Correlate

Insights

Actions



Active Signaling

(MAP, DIAMETER, GTP, ISUP, CAMEL, SIP, OTA, HTTP2)



Probes

SS7, DIAMETER, GTP/DPI, SIP, ISUP



External Data



Testing

Machine Learning & Analytics Models



Correlation, Aggregation, Filtering, etc.



Wholesale and Interconnect Analytics



Steering Analytics



Roaming Customer Experience Management



Customer and Retail Analytics



Permanent Roamer



IoT PacketPrinting



Steering of Roaming



Data Management Wallet



Active Testing



GTP Proxy



Local Breakout



Virtual Home Environment



Data Management Policy



Campaign Management



Roaming Hub



Multiline



Smart Mediator



RoamFilter



Least Cost and Smart Home Routing

....AND FOR FRAUD MANAGEMENT?



Security Feeds



Test call generator active testing



OSS/BSS Data



External data feeds

Updated rule library for known threats



Actionable analytics for unknown threats



TECHNICAL FRAUD

PBX Hacking
CLI Refiling
Call Reorigination
Caller ID Spoofing



DISTRIBUTION FRAUD

Dealer Fraud
Content Piracy



SUBSCRIPTION PAYMENT FRAUD

Subscription Fraud
High Usage Fraud



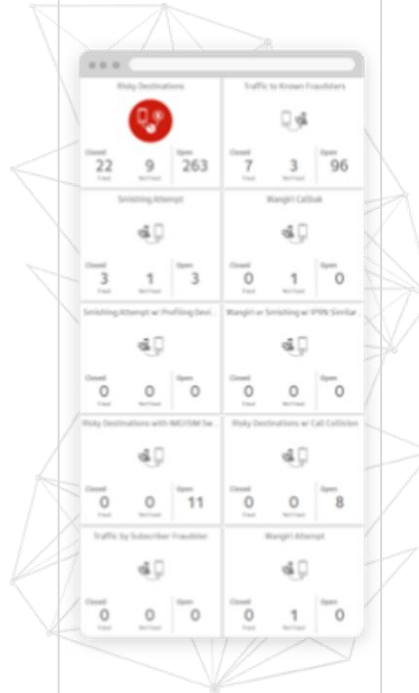
BUSINESS FRAUD

Roaming Fraud
International Revenue Share Fraud (IRSF)
Interconnect Abuse (GSM Gateways)
Robocalling
Bypass Fraud



PREPAID FRAUD

Prepaid Service Fraud



Enforcement Engines

- Voice Firewall
- SMS Firewall
- Data Firewall

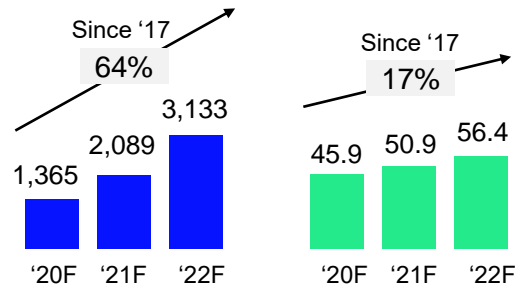


We bring a unique offer into the market

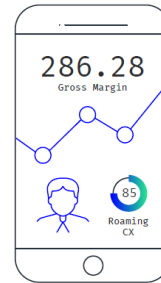
ROAMING & NETWORK SERVICES: OVERVIEW & KEY TRENDS



» Wholesale Roaming



» Roaming Quality



SSI
—
SQI
—
R-CX
—



» VoLTE Roaming & 3G Sunset



LTE data [roaming traffic across Asia surged by 245%](#) in 12 months

Roaming traffic from Asia to Europe and the Middle East increased by **88%, in 2019**



» E-SIM

eSIM-based devices will reach almost **two billion units by 2025, with a CAGR of 27%**



» Regulation

EU Roaming Regulation
—
GDPR
—



» IoT

20-30%

By **2020**, a typical MNO can expect at least 20 – 30% of Roaming revenues from **Roaming IoT**



» 5G









by 2024, **5G** subscriptions will reach 1.9 billion, and that coverage could blanket up to 65 percent of the world's population

ROAMING & NETWORK SERVICES: DETAILED PORTFOLIO



RETAIL ROAMING









Increase Revenue

-  Customer analytics silent roamers
-  Pricing and bundling
-  Roaming campaigns
-  Policy management
-  Subsidized Roaming
-  Travel insights and Monetization
-  Multiline services
-  Targeted Advertising



ROAMING EXPERIENCE










Improve Customer Experience

-  Network & Customer Experience
-  VIP Monitoring
-  Customer Care
-  Caller ID Guarantee
-  Virtual Home Environment
-  Active Roaming & Interconnect Testing
-  Border Roaming Prevention
-  Roaming Experience Survey



WHOLESALE ROAMING







Reduce Costs

-  Roaming Traffic Steering
-  Border Roaming Control
-  Wholesale analytics
-  Roaming Replicator
-  RoamSIM
-  Permanent roaming detection & management
-  Least cost routing services
-  CLI Guarantee
-  Local Breakout



ROAMING OPERATIONS

Enhance Operational Efficiency

-  Regulatory compliance
-  Virtual Deployment
-  NFV and Cloudification
-  Roaming Hubs
-  Managed Services
-  Smart Mediator

SECURITY: OVERVIEW & KEY TRENDS



58%

Of Enterprises (and 52% of consumers) would leave or consider leaving their operator because of a security breach



73%

Of Enterprises (and 62% of Consumers) would want to use 2FA less, stop using or have an alternative



3rd





Most likely reason to churn after price and coverage



SECURITY: DETAILED PORTFOLIO









SIGNALLING FIREWALL

-  Active Protection Firewall
-  Protection on SS7, Diameter, GTP, SIP, HTTP*
-  Voice Firewall
– Caller ID Spoofing, Robocalling
-  5G SEPP*








ADVANCED THREAT PROTECTION

-  A2P Bypass Detection and Protection
-  SMS Spam Blocker
-  Node Behavior Change Tracking
-  Cross-protocol Threat Protection
-  Threat Intelligence Sharing
-  Penetration Testing



TRAFFIC ANOMALY DETECTION

-  Support for SS7, Diameter, GTP, SIP
-  Full Compliance with FS11, FS19, FS20 and Other Related Standards
-  Expert Rules
-  Advanced Analytical Models
-  Full Signaling Traces

NETWORK PENETRATION TESTING

FRAUD & RISK: OVERVIEW & KEY TRENDS



REVENUE ASSURANCE

\$2.4

trillion of losses in 2019
(33.6 billion US\$)



Automation

Limited automation:
capability score 2.6
out of 4



1.4%

The average
revenue leakage
is 1.4% of yearly
revenues (stable)



Prevention

Only 4 out
of 10 incidents
prevented



51%

The average revenue
recovery rate is 51%
(10% increase)



52%

Half of the
companies'
revenues
are covered

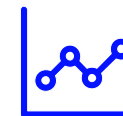


TELECOM FRAUD



\$29.2

Billion USD
Global Telecom
Fraud Loss



3.4%

Global Fraud
Perceived
Rising Level

Most Widespread Type of Telecom Fraud

01

\$12.8B

Revenue
Share Fraud

02

\$6.0B

Bypass
Fraud

03

\$2.9B

Arbitrage

04

\$3.02B

Theft / Stolen
Goods

05

\$2.39B








PRS

*CFCA 2017

FRAUD & RISK: DETAILED PORTFOLIO

















REVENUE ASSURANCE

-  Mobile Usage Assurance
-  Wireline Usage Assurance
-  Mobile Provisioning Assurance
-  Prepaid Balance Validation
-  Wireline Provisioning Assurance
-  Rating Validation
-  Billing Validation












FRAUD MANAGEMENT

-  Roaming Fraud
-  Bypass Fraud
-  Revenue Share Fraud
-  SIP & VoIP Fraud
-  CLI Spoofing
Robocalling Fraud
-  Prepaid Fraud
-  Subscription Fraud
-  Mobile Money Fraud
-  Dealer Fraud
-  OTT Bypass Fraud
-  Data Fraud
-  Content Fraud
-  M2M/IoT Fraud
-  Content Piracy






BUSINESS ASSURANCE

-  Partners Incentive Assurance
-  Suppliers Cost Assurance
-  Order Handling Assurance
-  Customer Problem Handling Assurance
-  Customer Collections Assurance
-  Workforce Management Assurance
-  Equipment Management Assurance
-  Costs and Margins Assurance
-  Leased Lines Assurance

BUSINESS OPERATIONS: DETAILED PORTFOLIO







CREDIT CONTROL AND COLLECTIONS

-  Collections Manager
-  Credit Control
-  Credit Scoring

Big data
Analytics






INCENTIVES MANAGEMENT

-  Incentives Library
-  Calculation Engine
-  Incentives Configuration
-  Dealer's Portal

Artificial Intelligence
& Machine Learning



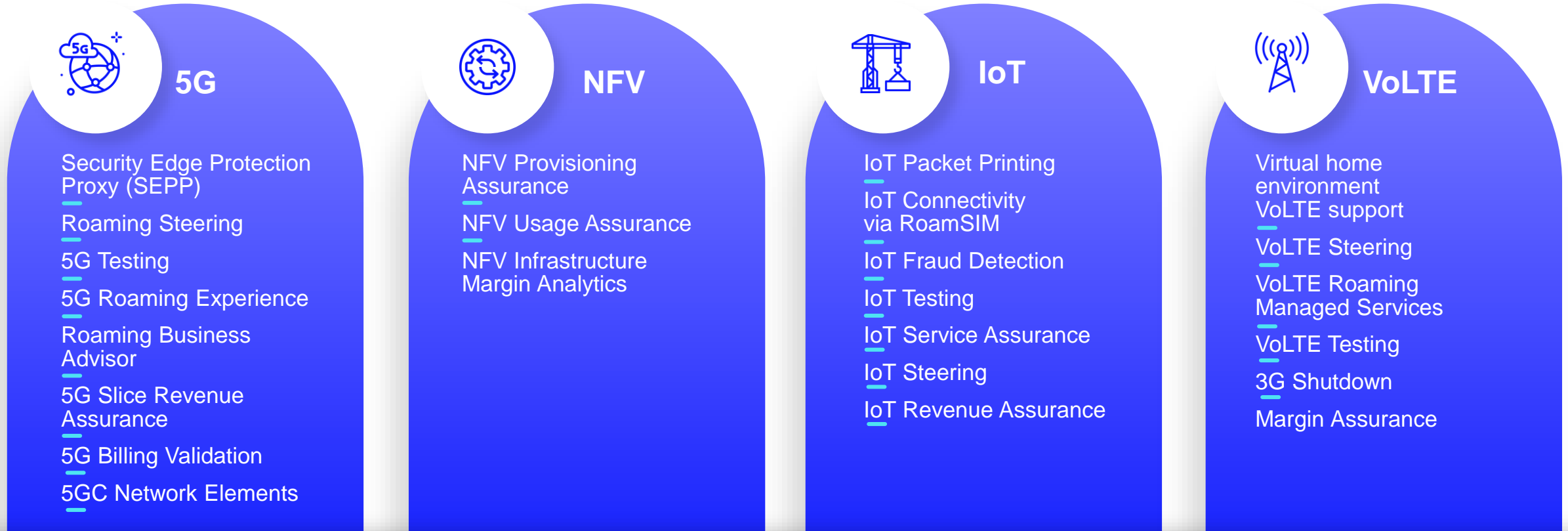
CRM ACTIONABLE INSIGHTS

-  Churn Identification and Prevention
-  Next Best Action /Next Best Offer
-  Cross-Sell and Upsell
-  Margin Optimization
-  Smart Capex
-  Pricing Optimization
-  Targeted Campaigns
-  CEM/ CSAT

Automated Action
& Campaigns

External Data Crawlers
& Integration

MOBILEUM SOLUTIONS COVER SEVERAL TECHNOLOGY DOMAINS



Technology domains



NFV



Delivery models



On-prem



Managed services

WHY MOBILEUM?



best-in-class,
award-winning
portfolio of solutions



Rich innovation –
200+ patents



A world-class
Machine Learning and
Analytics framework



Global, skilled
team with
deep domain focus



Industry-leading
customer footprint
across verticals –
3 in 4 operators
now use Mobileum



Financial
Strength
and Leverage



Efficient delivery,
and 24/7 support and ops,
via 25+ global locations



Rich cloud
and managed operations
and services capabilities

WE GATHER EVERY YEAR IN OUR LEADING INDUSTRY USER GROUP



LAST EVENT



+200
Attendees



+25
Speakers



+40
CSPs represented



+40
Countries represented





**THANK
YOU**

