Protection Against Uncertainty

HOW THE PANDEMIC IMPACTED CYBERCRIME & PROTECTION OF A KEY CHANNEL

100+ Pages featuring KPIs on SMS Firewall
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BEHIND EVERY ROCCO REPORT IS A GREAT TEAM

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JASON BRYAN

Jason is the CEO of ROCCO based at ROCCO HQ in Spain. He has overseen the last 7 years of in-depth monthly research on Industry Analysis, Vendor Performance, Market Intelligence and Market Pricing in the Roaming and Interconnect space. Jason was the founder of ROCCO in 2012, building on 25 years experience of Roaming and Interconnect roles in Vodafone, Telefonica Groups and a number of Vendors, as well as GSMA Chairmanship roles.
ABOUT THE REPORT COVER

During the last quarter of 2020, ROCCO launched the photography contest. The purpose was to collect images taken by people of the telecommunications industry to include in our report’s covers. Similarly to other initiatives that we have conducted such as the ROCCO IOO, we aim to show the human side of our industry.

The photography selected for this report was taken by Ben Bannister who is the Director of Mobility & IoT Services at TATA Communications. Prior to this he was also involved in the semiconductor industry in a range of Sales, Marketing and Operations roles. Ben has also written and contributed to a number of published articles about topics associated with Customer Care, Billing and Telecommunications service management and have been a regular presenter and speaker at Telecoms and Broadband conferences in Europe and Asia. Specialties: Product marketing, Partner marketing, Channel development, Contract Management, International business operations.

We want to acknowledge Ben and all the participants for their contribution to this initiative, and if you want to find out more about the photos stay tuned for the upcoming publications.
INTRODUCTION
The plethora of choices available in the SMS Firewall vendor community creates a challenge for MNOs to identify the right solution for their needs, and as SMS spam and phishing become increasingly more common, finding the right vendor is a crucial task — essential some would say. Nothing causes customer churn more than unsatisfactory service.

ROCCO has been called the Michelin of the telecoms industry in that it facilitates the rating of Vendors to understand the quality of vendors and the market leaders. However, ROCCO does not judge the Vendors directly but facilitates MNOs in rating them and giving opinions across the wider Vendor base, creating a community for information and advice exchange on specific important Vendor decisions.

Investing in Vendors always takes a great effort. MNOs need to make RFP, RFQ and selection processes which take time and energy away from the monetisation of SMS. This report aims to offer advice from other MNOs which might help MNOs not yet decided on which Vendor to choose. If the MNO is not part of a group, or an independent MNO they hardly ever get the advice of other MNOs to help make decisions on the challenges they face, so the benefits of listening to a truly neutral 3rd party like ROCCO are clear.

This year’s edition includes new insights that reflect on the special circumstances of 2020. As governments around the world started to implement lockdowns, the dependency on communication service providers (CSP) increased significantly. As a result, SMS volumes soared but this was also accompanied by a rise in cybercrime. The ROCCO SMS Firewall Vendor Benchmarking Report 2021 includes specific questions concerning these special events. This allows understanding how vendors have performed in such an adverse scenario, and also, how MNOs have coped with the headwind.
THE LEADING VENDORS

This is the fifth time that ROCCO has studied SMS Firewall, as the table below shows, this year we have 6 Tier-One vendors. The goal is to understand what the MNOs say about the vendors, as well as effectively record the vendors’ progress from an MNO point of view.

TIER TABLE

<table>
<thead>
<tr>
<th>TIERS</th>
<th>VENDORS</th>
</tr>
</thead>
</table>
| All ratings are out of 5 points. The Overall Rating determines the Tier in which the Vendor is placed within our Table. The Overall Rating is determined by the 4 sub-scores for the four rating sections:  
  - Performance KPIs  
  - Performance KPIs specific to SMS Firewall  
  - Leadership KPIs  
  - General Rating  
All ratings are combined to achieve an average Overall Rating, e.g. $3.5 + 3 + 4 + 3.5 = 3.5$ Overall Rating = Tier Two |
| Vendors are shown in Alphabetical Order with an overall ranking available in the Strategic Analysis Version of this report. |

TIER 1

ADAPTIVE MOBILE SECURITY
ANAM TECHNOLOGIES
COMVIVA
HAUD
INFOBIP
SINCH
215 MNOs from 109 countries have rated 27 SMS Firewall vendors. After discarding those companies without sufficient votes we have ranked 6 vendors inside the tier one category. This year’s highest vendor rating is 4.47 which is a higher rating than in the previous report.
As mentioned before, this year’s edition is the fifth time ROCCO releases a report on SMS Firewall vendor benchmarking. This provides us with a deep understanding of how has this service evolved over the years. The importance of having a secure SMS channel relies upon the fact that, over the years, OTT messaging Apps, and their business APIs, have gained significant ground. Therefore, if SMS channels do not remain secure, this would represent the demise of this messaging solution.

Our research indicates that, over the years, there has been an increase in the number of MNOs that have acquired SMS Firewall services. In this regard, two main factors are influencing this development. On one hand, SMS is still relevant despite all the pessimistic predictions of its decline. On the other hand, operators across the planet are becoming more aware of securing SMS monetisation, specifically, considering that SMS volumes soared in 2020.

Also, considering the evolution of top vendors, this shows that the SMS Firewall ecosystem has been improving over the years. Nonetheless, there are still issues that need a higher degree of commitment. This is the case of Grey routes, which we have estimated to be around 29% of total A2P SMS traffic. Also, the comment below points out the necessity of pursuing innovation in SMS Firewall:

“The A2P SMS (blended routes from grey) via SIM box is the threat for all MNOs. The threat can be minimized as long as the machine learning from FW is capable. This threat will always be there.”

Asian MNO

*ROCCO A2P SMS Market Intelligence Report 2020*
SMS FIREWALL 2020 HIGHLIGHTS

- 29% of total A2P SMS traffic is grey routes
- Average Overall Rating of Tier 1 Vendors in 2020: 4.25
- Protecting both Inbound & Outbound A2P SMS was the top priority for MNOs
- 32% of MNOs said that "How to Identify leakage & additional revenue streams" are the main challenges
- Vendors reached Tier 1 position in the 2020 edition
- SIM Farms was the most popular SMS FW topic in 2020
One of the major highlights of 2020 has been the rise of cybercrime. In this regard, we have asked several questions regarding SMS attacks.

**In 2020 how have the volumes of SMS Attacks changed?**

The results of SMS attacks show a clear picture where SMS attacks have been increased. Specifically, 49% of respondents state that SMS attacks have risen. Among them, 19% say that there has been a 10% increase in attacks, in contrast, only a reduced percentage of operators (6%) have stated for a 40% increase.

A small percentage of operators (17%) say that there has been no change in 2020. Finally, 34% of interviewed MNOs saw a reduction in 2020. Among them, “20% decrease” is the most recurrent finding (16%).
In 2020 what percentage of SMS Attacks has using the solution of your vendor prevented?

The effectiveness of the solution provided by a vendor is a crucial issue as an ineffective solution hurts both the reputation and the revenues of MNOs.

The results show that 48% of interviewed MNOs stated that the effectiveness of the chosen solution is above 70%. Among these, the most voted bracket is 80%-90% which accounts for 24% of operator votes. If we consider all the brackets that are below 50%, we find that they account for 45% of votes. All in all, this indicates that vendors must refine their solutions to increase the effectiveness and secure SMS channels for operators.
What would you say are the important trends in SMS Firewall?

The results show that operators consider AI & ML developments as the main trend related to SMS Firewall (28% of votes). In this regard, there are high expectations of these technologies in making the filtering process simpler. This is followed by "Interconnection Protection" (20%) and "Move to Complete SS7 Protection" (19%).

In the following box, there are listed the comments related to the "Other" section. The comments are on the line of new developments in telecoms such as smart filtering rules or CPaaS, while it is also mentioned a recurrent issue which is grey routes.

"Smart filtering rules based on content patterns"
"Content extensions"
"CPaaS"  "Recognition of grey routes; facilitating traffic monetization"
What would you say are the key trends in SMS Firewall fraud?

For MNOs the top 3 trends of SMS Firewall fraud are Spam, SIM Farms and Bypass. When compared to last year's report, SIM Farms remain one of the key trends in this service. However, SMPP Probing is no longer a top issue for operators. Moreover, both Spam and Bypass have risen in terms of relevance.
PERFORMANCE OVERVIEW

By considering the aggregate performance on specific SMS Firewall KPIs of the top vendors, it is possible to identify which areas are satisfactory for operators and what improvements have to be carried out.

Overall, the aggregate performance of these indicators is high as all ratings are above 4. Specifically, the top KPI is “Threat Protection Capabilities” which takes into account issues such as spamming, flooding or spoofing. Moreover, the top vendors also perform well in terms of “Technical Support” and in the “Ability to Protect both Inbound & Outbound A2P SMS”. In contrast, vendors perform not so well at “IP Route Monitoring & Blocking Capabilities”.

![Performance KPIs Chart](chart.png)
It is worth considering to know what MNOs care the most about SMS Firewall. *When do you consider SMS Firewall which are the top 3 most important criteria for you as an Operator?*

The results show that “Ability to Protect both Inbound & Outbound A2P SMS”, “SIM Box/Farm Detection Capabilities” and “Flexibility of Business Models Offered” are the main criteria. When comparing this pie-chart with the information from the previous page, we find that only “Ability to Protect both Inbound & Outbound A2P SMS” is among the top 3 KPIs. This indicates that vendors need to focus more on the top 3 criteria to meet operators’ requirements more effectively.
Some operators also provided these comments about important SMS Firewall criteria:

"Complain solving & handling with aggregators"

"Grey Routes Protection"

"The OPEX"
What impacts if any has COVID-19 had on SMS Firewall, if any?

NO IMPACT/ WEAK IMPACT

"No" 4x  "None" 4x  "Nothing"

"No impact at all in 2021. Traffic grew 40% YoY"

"No much impact, only that the volume of SMS increase due to broadcast SMS"

"Not a lot"

"Not clear"

"Not significant impact was observed"

"Nothing experienced from my end"

"Not observed"

INCREASE IN ATTACKS

"A clear traffic volume increase!!!"  "Increase in traffic"

"A lot of grey-routes have come in place and the SMS Firewall has managed to detect them and convert into revenue"

"A2P messages increased which gave opportunity to fraudsters to use this channel for fraudulent activities"

"New contents to block"

"Considering increase in usage of Internet and virtual conferences etc authentication via SMS has increased so the importance of SMS firewall"

"Grey Routes & SIM Boxes in HPLMN have exponentially increased during COVID-19"

"More attacks have been reported during COVID-19, Therefore the SMS Firewall rules have constantly had to be updated for the new threats"

"More fraud to protect from"

"More SMS, more fraud"

"More scam SMS coming from legal routes"

"Much more phishing smses, especially for post / packages market and banking"

"We have seen more of an increase during 2020 as compared to previous years"
OTHER IMPACTS

"People have trend to using more application for work and entertainment, which make traffic raise"  "Positive impact"

"The need to perform a great PoC on traffic, with ANAM and undertaken in order to discover all the details on fraud and monetizable sources and routes. This was absolutely revealing and amazing"

"The SMS FW helped to prevent fraud and spams related to the COVID-19"

"The SMS FW prevented hackers to lure bank customers from being hacked by stopping phishing messages to provide their bank details for online banking during lockdown"

"Very High Impact"

"People have trend to using more application for work and entertainment, which make traffic raise"

"There has been a shift in patterns and SMS type. You need a vendor who is on the ball to make sure one is prepared"

"There was a slight increase in traffic"

"Volume increased"  "Traffic count ups and downs"

"We have been proactive to mitigate the risk of fake SMS at the beginning of pandemic time. the measures taken together with Infobip comes with a great protection result"

"Made it more important"  "In fact, it gives positive impact to SMS firewall experiences"

"We noticed a number of lesser trusted MNOs and aggregators attempting to take advantage of COVID-19 and Sinch have helped us manage and remove these concerns"

"COVID has led to a range of SMS Fraud attacks with messages related to COVID-19. Cellusys SMS Firewall has enabled us to quickly identify and mitigate these attacks"

"Fake/scam SMS on COVID information which triggers users to reply/being charged"

"Increased importance of SMS Firewall" 2x

"Increased traffic to the SMS Firewall"
SUGGESTIONS FOR VENDORS

As the ecosystem evolves, operators’ requirements grow in terms of complexity and vendors have to be responsive in terms of meeting these demands.

**Is there any service you want from SMS Firewall providers that they don't offer already?**

- “Able to block OTT SMS”
- “Real-time protection”
- “AI to detect phishing and scam”
- “Proactiveness”
- “Artificial Intelligence in the SMS Firewall has now become a necessity to detect and protect Gray Route Traffics which indirectly protects A2P Revenue streams”
- “Central real time newsfeed with new examples of phishing”
- “Context Awareness”
- “Context Extension”
- “P2P Quality”
- “Integration of ML”
- “SRI filtering”
- “IP route monitoring and blocking capabilities”
- “More detailed reports, report customization, daily, weekly, monthly trend to capable the customer monitor the growth trend and decline of the risks”
- “Reports/rules feeding or sharing to external security awareness platform”
- “RCS” 3x
- “In-depth analytics”
- “We need to have similar solution for Voice Grey Routes, detect them and convert into revenue”
- “The capability of clasifying A2P messages: transactional from promotional ones in order to land special charging for each group”
- “The flexibility to identify and charge for different A2P type messaging. Promotional ones on one side, transactional ones on the other sides with specific rates different from the first ones. On the other hand, an OTT-based charging in order to enable MNOs to negotiate directly with OTTs”
PERFORMANCE

The assessment of performance is vital as it allows us to understand how MNOs rate the type of service that vendors are providing. The analysis follows two steps, the first concerns General Performance KPIs, while Performance+ denotes the KPIs that are specifically related to SMS Firewall. Several performance criteria are buzz words used in our industry to define quality performance. For example, company A is good value for money but is not flexible.

Moreover, brand messages often use performance criteria to promote specific features of a product or service. However, sometimes we cannot quantify if the brand message is accurate or purely a marketing vision. For example, SIM Box/Farm detection capabilities is a performance indicator required of an SMS Firewall vendor and may be advertised as a feature of the provider but not always delivered to the degree needed by the operator.

In essence, our survey helps quantify performance criteria to assist MNOs in getting a broader perspective.

GENERAL PERFORMANCE KPIs

- RELIABILITY
- CUSTOMER SERVICE
- TECHNICAL EXPERTISE
- REPUTATION
- VALUE FOR MONEY
- UNDERSTANDING OF THEIR INDUSTRY
- OFFERS EXCELLENT VALUE ADDED SERVICES (VAS)
- QUALITY OF SERVICE
- TRANSPARENCY
- FLEXIBILITY
**PERFORMANCE KPIs (On important SMS Firewall specific aspects)**

- Flexibility of business models offered
- Ability to protect both inbound & outbound A2P SMS
- SS7 route monitoring & blocking capabilities
- IP route monitoring & blocking capabilities
- Threat protection capabilities (Spamming, flooding, spoofing, etc....)
- Real-time notification capabilities associated with threat protection
- SIM box/farm detection capabilities
- Pattern recognition capabilities (Determination of what is A2P and what is P2P)
- Pro-active network penetration testing capabilities
- Outbound routing capabilities (To assist an MNO with growing their own A2P offerings)
- Knowledge of A2P SMS markets & trends
- Global market intelligence of A2P pricing
- Technical support
- Managed service offerings & capabilities
- Report frequency
- Report detail
- Report optimisation
- Report customisation
At the beginning of our survey, we asked the MNOs to tell us about their general perceptions of all the vendors. We call this the **General Rating** and if the MNO does not know the Vendor then they just say they don’t know the vendor and no rating is added to the score. This indicator is one of the 4 criteria used to ascertain the overall rating.

**GENERAL RATING**

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANAM TECHNOLOGIES</td>
<td>4.34</td>
</tr>
<tr>
<td>SINCHE</td>
<td>3.8</td>
</tr>
<tr>
<td>ADAPTIVE MOBILE SECURITY</td>
<td>3.66</td>
</tr>
<tr>
<td>AMD TELECOM</td>
<td>3.12</td>
</tr>
<tr>
<td>ALARIS LABS</td>
<td>3</td>
</tr>
<tr>
<td>ANTWERP TECHNOLOGIES</td>
<td>3</td>
</tr>
<tr>
<td>BICS</td>
<td>3.36</td>
</tr>
<tr>
<td>CELLYSYS</td>
<td>3.42</td>
</tr>
<tr>
<td>COMPUTARIS INTERNATIONAL</td>
<td>2.91</td>
</tr>
<tr>
<td>COMVIVA</td>
<td>3.41</td>
</tr>
<tr>
<td>GLOBAL MESSAGE SERVICES</td>
<td>3.33</td>
</tr>
<tr>
<td>GLOBE TELESERVICES</td>
<td>2.98</td>
</tr>
<tr>
<td>HAUD</td>
<td>3.23</td>
</tr>
<tr>
<td>HGC GLOBAL COMMUNICATIONS</td>
<td>3.13</td>
</tr>
<tr>
<td>INFOBIP</td>
<td>3.66</td>
</tr>
<tr>
<td>LANCK TELECOM</td>
<td>3</td>
</tr>
<tr>
<td>MAVENIR</td>
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<td>MITTO</td>
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<tr>
<td>MOBILEUM</td>
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<tr>
<td>MOBIUS WIRELESS</td>
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<tr>
<td>NEWNET</td>
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<td>OMOBIO</td>
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<td>SAP</td>
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<td>3.8</td>
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<td>SYNIVERSE</td>
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<td>TANGO TELECOM</td>
<td>3</td>
</tr>
<tr>
<td>TYNTEC</td>
<td>3.17</td>
</tr>
</tbody>
</table>

**ANAM TECHNOLOGIES** is the vendor that has the highest general rating (**4.34**). **SINCH** has the second-highest rating (**3.8**) and it is followed by both **INFOBIP** and **ADAPTIVE MOBILE SECURITY** (**3.66**).
At the beginning of our survey, we ask all the MNOs to tell us about how well they know the brand of the Vendors. We call this Brand Awareness. All MNOs are in a position to say whether they know or do not know a vendor so all responses are counted. You can see that it’s very tough for some Vendors to market themselves globally and are not as well known as others who maybe have more established customer bases.

<table>
<thead>
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<tr>
<td>ADAPTIVE MOBILE SECURITY</td>
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<td>ALARIS LABS</td>
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<td>ANAM TECHNOLOGIES</td>
<td>3.68</td>
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<tr>
<td>ANTWERP TECHNOLOGIES</td>
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<td>BICS</td>
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<td>HAUD</td>
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<td>INFOBIP</td>
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<tr>
<td>LANCK TELECOM</td>
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<td>MAVENIR</td>
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<td>MITTO</td>
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<td>NEWMET</td>
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<tr>
<td>OMObio</td>
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<td>ROUTE MOBILE</td>
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<td>SYNIVERSE</td>
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<td>TANGO TELECOM</td>
<td>2.18</td>
</tr>
<tr>
<td>TYNTec</td>
<td>2.65</td>
</tr>
</tbody>
</table>

The differences between top performers in brand awareness are tight, as ANAM has 3.68 and Infobip has 3.67. The third-highest rating in this case is for BICS (3.63).
ANAM TECHNOLOGIES PERFORMANCE RATING

- Reliability: 4.67
- Customer Service: 4.56
- Technical Expertise: 4.79
- Reputation: 4.72
- Value for Money: 4.48
- Industry Awareness: 4.54
- Offers Excellent VAS: 4.32
- Quality of Service: 4.68
- Transparency: 4.47
- Flexibility: 4.49

Score from 1 to 5
COMMENTS ABOUT ANAM TECHNOLOGIES

"ANAM is providing FW service to us and supporting for SMS messaging incoming and outgoing. Daily significant case reports or mails if there any case happen, we would like to receive. Market analysis or outgoing traffic analysis we would like to receive from ANAM as well. Technical supports improving and need to more transparency for Fraud, SIM Box detecting, prevention, monitoring, actions and cooperation. I’m really appreciating for all of ANAM supports such as webpage monitoring, system daily reports, open ticket supports, cooperation of commercial and technical to find solutions, technical supports improvement and external auditing for FW services"

"Their services are good!"  "Bunch on knowledgeable and supportive team"

"ANAM is a trusted partner that deliver values for our group"
“We have been working with ANAM for the past 1.5 years. They are very professional, helpful and provide not only technical expertise but also commercial advice and application. Happy with their service”

“Good technology with high performance”

“A reliable partner”

“Good hardware but managed service and technical support not on the same level”

“ANAM is a very competent team. ANAM SMS FW solution is very flexible and very reliable and any changes we need are delivered fast and quality”

“Reliable”

“From the workshop and the information i got from different places, I believe they are the best”

“I think what ANAM has provided to us is excellent in their technologies and performances”

“Very satisfied”

“Very capable, flexible to protect and maximize A2P SMS business performance”

“Great service and customer relationships”

“Very professional and committed”

“Since using ANAM FW capabilities, we have improved in flexibility towards services which we can offer to our customers”

“Excellent system with the right people to support it”

“They are Flexible in business models & Export in SS7 route, SIM BOX & Pattern protection”

“Good overall”

“Good company, realizable products but less flexibility to quick adapt and fighting with Simbox/spammer and service requirements”

“Very attentive to support tickets and technical explanation”

“Good reliable solution for subscriber protection and network protection”

“Good and rapid response to what needed”

“Trusted provider”

“They are a trusted and reliable vendor”

“Great Support”

“ANAM has very good customer support and is indeed an expert in the industry”

“They are very good in their job, with fast answers and solutions”

“Excellent performance”

“Optimized technology”
"ANAM is good partner to work with, however they should work on improving stakeholder alignment especially, the Operating environment in the Trouble to Resolve bucket"

"The firewall solution is powerful, and the implementation of the firewall was very professional"

"I think they are the go-to people in the business"

"QUITE RELIABLE!" "Fantastic product and support!"

"I am satisfied with the service provided by ANAM"

"Flexible SMS FW rule handling on signaling and content, able to support efficiently and understand our network challenges on outband and inband traffic"

"They clearly know their market and go a long way to help us with our existing and potential customers"

"They have the best expertise and they are focused on the client"

"At a technical point of view - nice supplier to work with"

"Flexible and evolutive" "Reliable and flexible" 2x "Excellent"

"Excellent and versatile performance, versatility on business models, and flexibility to re arrange control algorithms without a lot of changes, marvelous platform for auditing"

"ANAM is reliable and available when some evolutions are needed"

"Great technology and it shows in their consistent top performance"

"Very professional, customer friendly, helpful team members and owners. Highly recommended!"

"Great solution & amazing team!" "World-leading"

"Excellent managed service" "Overall, ANAM performance is great"

"ANAM is always willing to go the extra mile as a strategic partner to MTN to provide value through technology and services to the business"

"It is an excellent partner in order to engage with the A2P SMS messaging monetization. They put you in a favorable situation, instead of being putting OTT or themselves as SMS aggegator first"
LEADERBOARD

The following charts show how the Vendors performed against all rating criteria and define the overall Vendor Ranking we call the Leaderboard.

How do we calculate the leaders? We take the:

- Average of Performance Category
- Average of Performance+ Category (those KPIs specific to the SMS Firewall service)
- Average of Leadership Category
- Average of General Rating Category
- And we create an overall average

We have concluded from our experience that this is the fairest way of understanding the overall Vendor Ranking.

The following charts show how the Vendors performed against all rating criteria and define the overall Vendor Ranking we call the Leaderboard.

How do we calculate the leaders? We take the:

- Average of Performance Category
- Average of Performance+ Category KPIs (those KPIs specific to the Vendors service)
- Average of Leadership Category KPIs
- Average of General Rating Category
- And we create an overall average

We have concluded from our experience that this is the fairest way of understanding the overall Vendor Ranking.
After releasing several publications of SMS Firewall vendor benchmarking, there are some points worth noting. For instance, the number of Tier 1 vendors has increased, as in 2020 there were 4 and this year there are 6 vendors, overall, this widens the choices for MNOs. Moreover, the average overall rating of top vendors has slightly increased from 4.25 to 4.28. These two findings indicate that the SMS Firewall ecosystem has positively evolved. This is particularly a good result considering the adverse circumstances derived from the pandemic which, among other issues, have featured an increase in fraud.

Despite the positive developments, some issues need to be tackled for the benefit of the entire ecosystem. For instance, some MNOs indicated that the effectiveness of the solutions of the vendors must increase to tackle the rise of SMS attacks. Also, grey routes remains a contentious issue that highlights the necessity of achieving higher coordination between the members of the messaging space.
IDENTIFYING VENDORS

There is often no formal list of Vendors available to MNOs. Even associations don’t have all vendors as members and often don’t provide full lists for people to view. We find there are a number of sources to create a definite list. The vendors that were included in this survey appeared because of one of several reasons:

- They are easy to find with search engines
- They are active in social media
- They were recommended to be included by MNOs from personal experience
- They attend Industry Events and are known in the Industry, because they have Exhibition stands, produce standards in Industry associations, or simply throw promotional events or parties
- They are known Vendors to ROCCO

Even after checking all these sources, sometimes we miss a certain vendor. There is no intention behind this. We are happy to include all Vendors however long this makes our list of Vendors that are included. However, looking at the list below we believe it to be definitive.

VENDORS WHO WERE INCLUDED IN THIS RESEARCH

- Adaptive Mobile Security
- AMD Telecom
- Alaris Labs
- ANAM Technologies
- Antwerp Technologies
- BICS
- Cellusys
- Computaris International
- Comviva
- Global Message Services
- Globe Teleservices Ltd
- HAUD Systems Ltd
- HGC Global Communications
- Infobip
- Lanck Telecom
- Mavenir
- Mitto
- Mobileum
- Mobius Wireless Solutions
- NewNet
- Omobio
- Route Mobile
- SAP
- Sinch
- Syniverse
- Tango Telecom
- tyntec
<table>
<thead>
<tr>
<th>VENDORS</th>
<th>REASON FOR REMOVAL</th>
</tr>
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<tbody>
<tr>
<td>AMD TELECOM</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>ALARIS LABS</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>ANTWERP TECHNOLOGIES</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>BICS</td>
<td>Not enough MNO ratings to provide meaningful results</td>
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<tr>
<td>CELLUSYS</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>COMPUTARIS INTERNATIONAL</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>GLOBAL MESSAGE SERVICES</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>GLOBE TELESERVICES Ltd</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>HGC GLOBAL COMMUNICATIONS</td>
<td>Not enough MNO ratings to provide meaningful results</td>
</tr>
<tr>
<td>LANCK TELECOM</td>
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<td>MAVENIR</td>
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<td>OMOBIO</td>
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<tr>
<td>ROUTE MOBILE</td>
<td>Not enough MNO ratings to provide meaningful results</td>
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<tr>
<td>SAP</td>
<td>Not enough MNO ratings to provide meaningful results</td>
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</tbody>
</table>
Regretfully while 27 Vendors were featured in the report, not all Vendors are ranked in our rating table, this is either because there was no demand from MNOs to talk about them or the views were so minimal that we were not able to draw a significant picture on how they perform. We sought a minimum of 5 ratings from an MNO before including them in our rating table.

However, what the research does do, as with all of our reports, is provided that we have at least 5 responses from MNOs about a Vendor, is allow for any Vendor large or small to appear in our reports. We want to encourage competition in the market and in so doing allow a good choice of Vendors to MNOs, so we actively encourage even the smallest Vendor to grow its business and compete. Overall, vendors should be recognised for a job well done, or in case they didn't perform optimally, should have the ability to identify where they can improve. Even if they may not agree with the MNOs views here, they may have a second opinion into what's important to MNOs.

The chart below presents the percentage of times Vendors were chosen by respondents for further Performance and Leadership ratings. A vendor’s position in the tiering system depends upon the Performance and Leadership ratings given for that Vendor. There is no connection between how many people choose to give Performance and Leadership ratings about a Vendor, as to how well that Vendor can perform. This is to ensure fairness to all providers large and small.
However, to get a reasonable perception of a Vendor (not based on a single possibly biased view), ROCCO requires that at least 5 MNOs select to give Performance and Leadership ratings to a Vendor before including that Vendor in our report.

Several Vendors were removed from our report since fewer than 5 MNOs chose to give Performance and Leadership ratings to them. These Vendors being removed from this report has no reflection on their ability to perform IPX Networks services, just the amount of MNOs who wanted to talk about them within our research.

YOUR FEEDBACK, OUR FUTURE REPORTS

This represents ROCCO’s fifth SMS Firewall Vendor Benchmarking Report. As we progress with our research, we intend to refine questions and results much more finely. We are also aware that our aim of being able to capture this data depends purely on the MNOs and their willingness to participate.

There are 700+ MNOs within the GSMA Membership. We make a considerable effort to reach all the existing MNOs so as to find the suitable individual for each study we conduct. It should be noted that it is important to identify respondents who know who the Providers are and can actively comment.

We would welcome your feedback on our questions, research, interpretation of the results and our presentation of the results. Please contact HQ@rocco.group to give your view. We have taken a lot of feedback on this survey which we intend to use in the revision of this survey for 2022.

In 2022 we intend to repeat several questions we have created here and then understand how perceptions are changing with regards to SMS Firewall Vendors and how their performance has evolved.