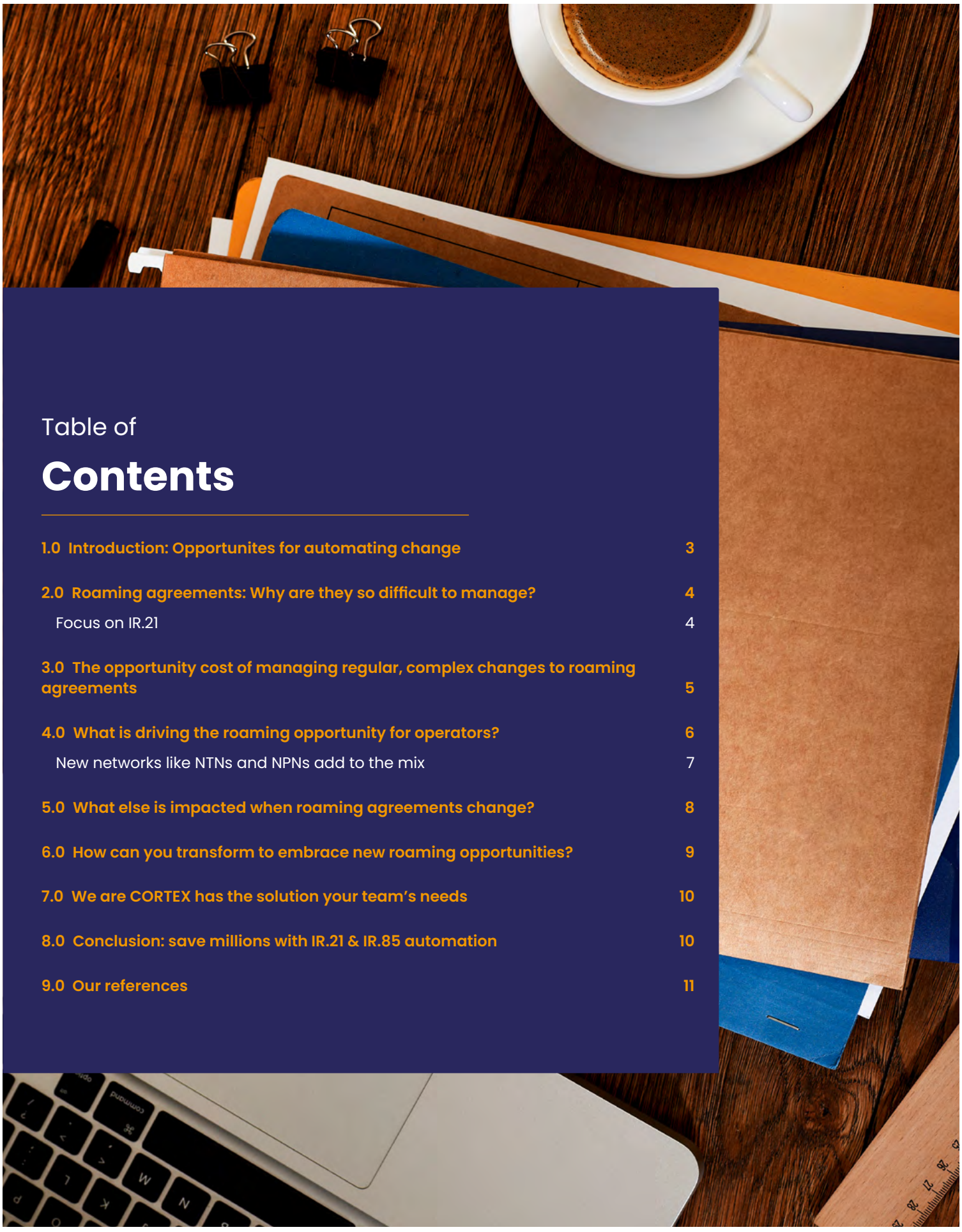
The essential step for capitalising on new roaming opportunities

Automating IR.21 and IR.85 change implementation in your operations



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Opportunites for automating change

Automation has already become an established priority for the telco ecosystem. But it's important to focus on where it can add the most business value, benefit, and efficiency quickly and incrementally, while identifying the main friction points, rather than running blindly into 'big bang' transformation and the risk that entails.

There are several candidates for early automation in telecoms, including network automation (automating the management, deployment, and monitoring of network devices and services to significantly improve the efficiency of network operations, reduce human errors, optimise customer experience, and minimise downtime).

Other early targets include incident management (to maintain service quality and customer satisfaction through the swift resolution of issues), the dynamic provisioning and orchestration of services, and analytics, to name a few.

However, single domain automation can deliver results quickly and easily. Consider roaming, an area that has received less attention than it deserves.

Roaming depends on complex agreements that govern the service parameters and the performance levels that need to be met.

As you know, these agreements run to hundreds of pages and contain an extensive set of variables and parameters – if you are reading this paper you're sure to be familiar with the complexities of IR.21 and IR.85 (PRD IR.21 – International Roaming, Permanent Reference Document Number 21, and PRD IR.85 - GSMA Roaming Database Structure and Updating Procedures to give them their full names) roaming agreements set by the GSMA.

Of course, when agreements change or are upgraded, there are multiple repercussions throughout the entire partner ecosystem that consume significant time for roaming and commercial teams.

Any amendment introduces significant complexity – and operators may have hundreds of such agreements. We call this the "IR problem" (see section below).

It means that there is a significant opportunity for operators and service providers to drive efficiencies through automation and to liberate time that enables engineers, roaming teams and wholesale teams to focus on new opportunities, service diversification, and revenue growth.

In this paper, we'll explore the opportunities for automating the process of managing changes to roaming agreements and the new revenue benefits that can be secured, and explain how We Are CORTEX is ideally placed to help. In Part 2, we'll show you how that can be achieved in practice.

Roaming agreements:

Why are they so difficult to manage?

Roaming agreements (direct and indirect) – particularly IR.21, but others too, including IR.85 – are covered by documents specified by the GSMA that outline the required levels of service and performance demanded of roaming functionality. They often run into hundreds of pages and are often updated or amended each month for a typical operator.

These GSMA documents formalise the requirements for the necessary exchange of information between MNOs that seek to build (and maintain) direct roaming with peers, as well as indirect interconnection via roaming hub partners.

As a result, most MNOs have a mix of direct and indirect agreements, which are lengthy and contain numerous parameters

Focus on IR.21

The current version of IR.21 (v17), for example, runs to 185 pages, covering:

- Different types of service provider – MNOs, MVNOs, and so on.
- Roaming services supported – 2G, 3G, 4G, 5G-NR, VoLTE, CS, PS, VoIMS, MIoT-LTE-M and more.
- The parameters associated with each service, of which there are simply too many to list.

Each page then provides multiple tables, which each outline the specific and unique parameters that roaming partners need to uphold. The document specifies not just individual settings for network infrastructure, but also the versions of signalling methods used.

MAP (Mobile Application Part) is frequently referenced, but then both MAP v2 and v3 are referenced, so different interfaces must be supported in the appropriate domain and signalling entities.

If that's not complicated enough, roaming specifications for 5G SA, Non-Terrestrial Networks (NTNs), and Non-Public Networks (NPNs), among others, are now also under consideration.

To some extent, the GSMA has sought to mitigate this complexity by introducing a global database that is available to mobile service providers, through which one party can introduce a new version of its IR.21 specification and make it automatically available to all peers that need it. The Roaming Agreement Exchange (RAEX) service facilitates information discovery and availability – but it does not implement the requisite changes in the networks of the affected party.

It helps, to be sure – but it leaves a gap.

As a result, keeping up to speed with changes requires operators to implement them throughout the network. So, as MNOs and others change their IR.21 (and IR.85) documents, the impacted parties must ingest and verify this information, understand its impact, effect changes – and validate that these have been implemented correctly throughout the network, including all roaming partners.

Similarly, the issuing party must document and catalogue changes, so that receiving peers can manage their own governance procedures.

The implications are clear: with changes to IR.21 and IR.85 expected on a regular basis, and with potentially hundreds of these agreements in place, your roaming and wholesale teams must devote the majority of their time to managing these changes and making the necessary adjustments to their networks.

The opportunity cost of

managing regular, complex changes to roaming agreements

We are not preaching to the converted here! Roaming agreements, as you know, bring huge complexity. Getting it right is essential.

Just as you expect the highest QoS and customer experience (CX) for your own customers when they are roaming on partner networks, your partners expect their customers (inbound roamers) to enjoy the same CX on your network. When things change it's vital to validate that service configurations match those set out in the relevant IR documents.

In addition, there is always the risk that a partner may determine that they need different primary partners in your country, so this is not only a moving target, but also an existential one – because it directly impacts on your ability to deliver services as a provider and to sustain valuable relationships with your peers.

Automating both the review of documents obtained from RAEX and implementing the required changes is not only desirable – it's essential for liberating your teams to build out new services and explore new opportunities.

Remember, 5G SA roaming is imminent, which will add to the complexity – and NTNs and NPNs are on the horizon.

Roaming is an obvious candidate for automation — and the legacy mode of operation needs to change.

What is driving

the roaming opportunity for operators?

With that in mind, though, what's the key driver for change? After all, if your processes seem to be working, why change? And, isn't roaming a declining market?

That's the headline presented by Counterpoint Research, which claims that global operator retail revenues will fall by one third by 2030[1] . That's quite a drop – but do the numbers tell a different story?

Dig into the details and a different picture emerges. In fact, this decline is attributed to revenue lost to eSIM providers which are capturing a growing share of revenues formerly held by traditional mobile network operators – so the revenue is there, it's just diverted either to lower-cost plans, or to rival providers and away from classical MNOs.

This means you still have the problem of maintaining agreements so that you can ensure QoS and CX and you probably have to support a new tier of eSIM providers, operating globally – because they will still rely on your physical networks to deliver connectivity to their customers. In other words, the complexity is growing.

New service possibilities bring new levels of complexity

But that's not all. Even while consumer revenue may change, wholesale roaming revenue is, according to Juniper Research, set to double by 2029[2] . Juniper reckons this will be driven by more complex services associated with 5G like URLLC (Ultra Reliable Low Latency Communication) which will attract a premium over and above standard charges for consumer roaming access.

In a related development, advanced roaming steering is also cited – which is linked to the growth of opportunities based on network slicing. In such cases, sessions need to be directed towards slices (or networks) that best serve their needs and the use case concerned. Doing so requires the right tools and is expected to lead to additional premium opportunities.

Juniper[3] also notes that IoT service revenue will also enjoy strong growth, reaching an estimated figure of $2 billion globally by 2028, equivalent to 10% of the global wholesale roaming market. Here, it's important to note that IoT services are highly variable – some of which are basic, but others may have very particular QoS demands – and hence attract more value while placing stringent demands on network resources and capabilities.

Others agree[4]. The bottom line is that the roaming universe is set to expand, bringing millions of new devices, new service requirements, and placing new demands on service providers – and the MNO networks on which all such services depend. And, in turn, these additional considerations go beyond the scope of current IR.21 and IR.85 agreements.

New networks like NTNs and NPNs add to the mix

The research, however, doesn't not cover emerging opportunities, such as those presented by NTNs and interworking between PLMNs and connectivity provided by operators of satellite constellations.

The GSMA has catalogued a series of opportunities it has identified for NTN / PLMN interworking and handover[5].

These include: aviation, offshore, agriculture, utilities, adoption in global supply chains, industrial IoT, remote connectivity, smart cars, and more – all of which are monetizable and many of which will likely also require some form of roaming with classical PLMNs, as well as interconnection agreements – driving, therefore, new forms of IR.21 and IR.85

Similarly, there will also be new use cases based on roaming from NPNs to PLMNs, which will emerge as private networks continue to be rolled out – and as they evolve to embrace the latest 3GPP standards covering roaming from private to public domains.

All of which means that the automation of roaming is a hot potato – and an evolving opportunity. Manual implementation is not an option in such a fast-moving environment. Can you secure the revenue and profit benefits if you depend on legacy procedures and manual implementation of roaming agreements and the numerous changes that they inevitably demand? Automation of IR.21 and IR.85 changes is the only viable option. Otherwise, MNO roaming teams will be swamped — and unable to capitalise efficiently.

What else is impacted

when roaming agreements change?

When changes to these key documents occur, operators must adjust their network and systems to reflect them. This leads to myriad updates to ensure configuration of network systems and entities. In turn, operators must validate the changes and implement appropriate testing, with particular note to security procedures across international connections.

At the same time, operators must ensure internal governance procedures are respected, particularly for compliance to legislations such as NIS 2, DORA, the TSA and more. Auditing control systems and tracking changes are paramount here.

In addition, operators must consider the move from Transferred Account Procedures (TAP) – introduced in 1991 to manage roaming billing and settlement – to Billing and Charging Evolution (BCE) – which is a simplified and flexible optional settlement method designed for the future wholesale roaming settlement needs of operators[6].

In conclusion, MNOs are faced with a fast-moving environment which is changing in profound ways, moving from standard consumer roaming to an expanding set of use cases and services that may require optimised or specific performance requirements, subject to different policy rules and decisions. They will also have many more roaming partners to consider (such as NTN and NPN providers), so delivering these roaming services will become significantly more challenging.

How can you transform

to embrace new roaming opportunities?

Implementing changes to IR documents covers three essential phases:

1. **Detection**
2. **Impact assessment**
3. **Update implementation**

Detection of changes can be automated through the GSMA's RAEX – but the rest (currently) requires considerable manual intervention. Operators must audit and create compliance reports, update the OSS and network elements, ensure that tickets are raised, so that changes are logged and tracked and deploy the changes across core networks with the granularity to account for the different services. There's plenty that can go wrong with the implementation of the necessary changes.

In essence, there are four key areas in which problems with implementation can be found:

1 - CDR issues

Which can result in unbillable records and can arise from manual delay or error applying partner IR.21 changes (for example, those affecting Global Titles, IP ranges, IMSIs, APNs). Often visible after partner network upgrades or new launch.

2 - Signalling issues

Impairing service performance and quality, and including Session interruptions, attach failures, or MAP/Diameter misrouting. They may be transient in nature — but also recurring for specific partners.

3 - Mediation issues

These can include parser mismatches, incomplete batches of records, duplicate CDRs, and there may also be peaks during system upgrades or high-load periods, which means data may not be handled correctly.

4 - Partner information exchange issues

Covering problems such as TAP file rejections (soon to be BCE), IoT version mismatches, or DCH transfer failures – all of which can make large batches of records temporarily unbillable.

These issues have an impact on in/outbound service availability, CX and reputation, revenue from partners, costs from partners — and, crucially, your overall roaming profit and loss accounts.

So, is it possible to automate all of this to deliver unparalleled agility and efficiency — and to enable you to capitalise on the emerging roaming opportunities?

We Are CORTEX

has the solution your team's needs

CORTEX Roaming is a complete automation and orchestration framework for automating changes to IR.21 and IR.85 documents. It handles the entire end-to-end flow and turns a manual or partially manual process that in the past has taken weeks and condenses it into minutes, with appropriate fail safes and safeguards.

It enables you to protect margins and increase profits with improved service reliability, reduce time to support partner configuration and hub changes, support more partners and roaming services, ensure compliance and transparency with an end-to-end audit trail and quickly iterate process automation for continuous improvement.

Crucially, CORTEX allows you to spend less time on repetitive tasks enabling more focus on service innovation and monetisation.

Conclusion:

save millions with IR.21 & IR.85 automation

Automating IR.21 and IR.85 roaming agreement processing and implementation can save your business millions through more accurate accounting, while increasing efficiency by up to 80%. It can also reduce cyber risks by 50% through centralisation.

It allows operators to shift focus — from time-consuming, manual implementation of changes mandated by updates to your IR.21 and IR.85 agreements — to take advantage of high-value opportunities and strategic initiatives, such as:

- Exploring innovative roaming models
- 5G, IoT, NTN and NPN roaming implementation
- Strengthening roaming partner relationships
- Building new revenue streams

In the second part of this series, we'll show how CORTEX Roaming delivers in practice, with reference to operational needs, and highlight the new value operators can secure from roaming, in all its forms.

Our CORTEX Roaming platform can transform your roaming and wholesale business, liberating teams to target new revenue streams and opportunities.

Get in touch to find out how.

Our

references

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