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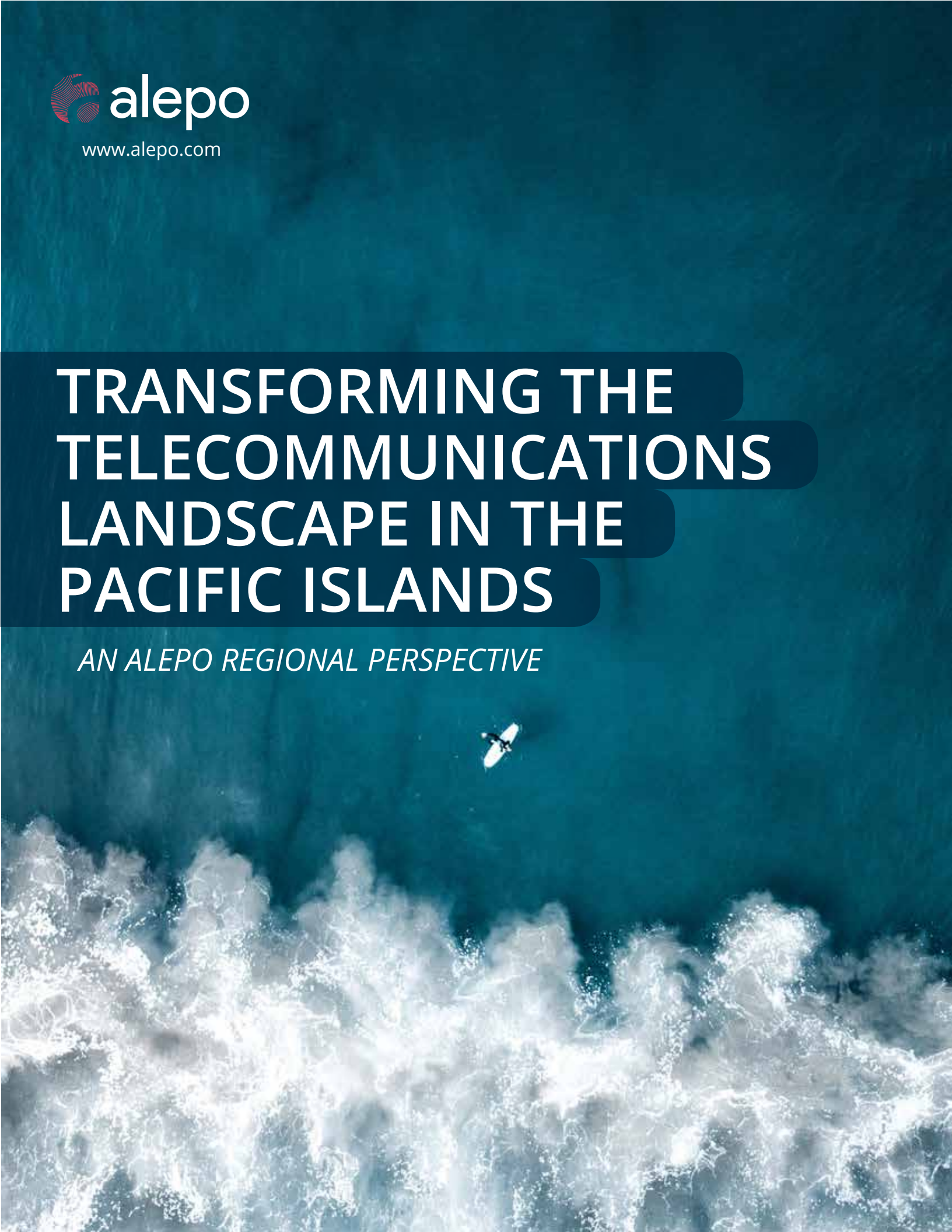
TRANSFORMING THE TELECOMMUNICATIONS LANDSCAPE IN THE PACIFIC ISLANDS

AN ALEPO REGIONAL PERSPECTIVE



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Telecommunications
in the Pacific Islands Today

The Pacific Islands stand to gain the most benefit from digital inclusion yet, at the same time, present some of the most significant challenges:

- Small geographically dispersed populations
- A sharp digital divide between, as well as within, nations
- Limited internet bandwidth from undersea cables
- Low internet penetration and relatively slow growth

These have meant that many populations remain underserved while operators struggle to find economies of scale.

Success in the Pacific Islands requires cost-effective, flexible, and resilient solutions that can:

- Create discrete networks for diverse needs
- Support a range of access modalities (mobile, WiFi, fixed-line) across generations of radio (2G-5G)
- Offer an open platform for collaboration with other development partners
- Manage bandwidth and quality-of-service (QoS) in real-time
- Provide end-to-end digital engagement to consumers

The region continues to see growth in 4G services, with penetration expecting to cover 60% of the population by 2025. 5G, in turn, is expected to have a small but transformative role.

Alepo has had a long and successful history enabling wireless and traditional data services, helping providers build a more connected Pacific. Its modular, open, and virtualized solutions have aided Pacific operators of all sizes to deliver world-class services to their nations.

Its own globally recognized digital transformation allows Alepo to offer complete digital business support systems, with time-to-market and costings that afford access to all islands and communities.

Strong Track Record
in the Region

A growing list of deployments demonstrates Alepo's commitment and successes in the region. Solutions cover billing, authentication, revenue management, CRM, bandwidth management, and digital apps across 2G, 3G, LTE, WiFi, and fixed-line.

Among the first to announce a 5G core solution and a 5G-ready digital BSS, Alepo will doubtless be a key partner for 5G throughout the region.

Alepo's combination of breadth, modularity, and a modern DevOps deployment has uniquely enabled it to address the region's broad range of requirements while offering a rapid, cost-effective implementation on a private or public cloud.

Since 2006, Alepo has supported both greenfield and incumbent communications service providers (CSPs). These have ranged from large transnational operators looking to gain a foothold in the area to small national operators seeking a reliable and dependable system to support the needs of their people.

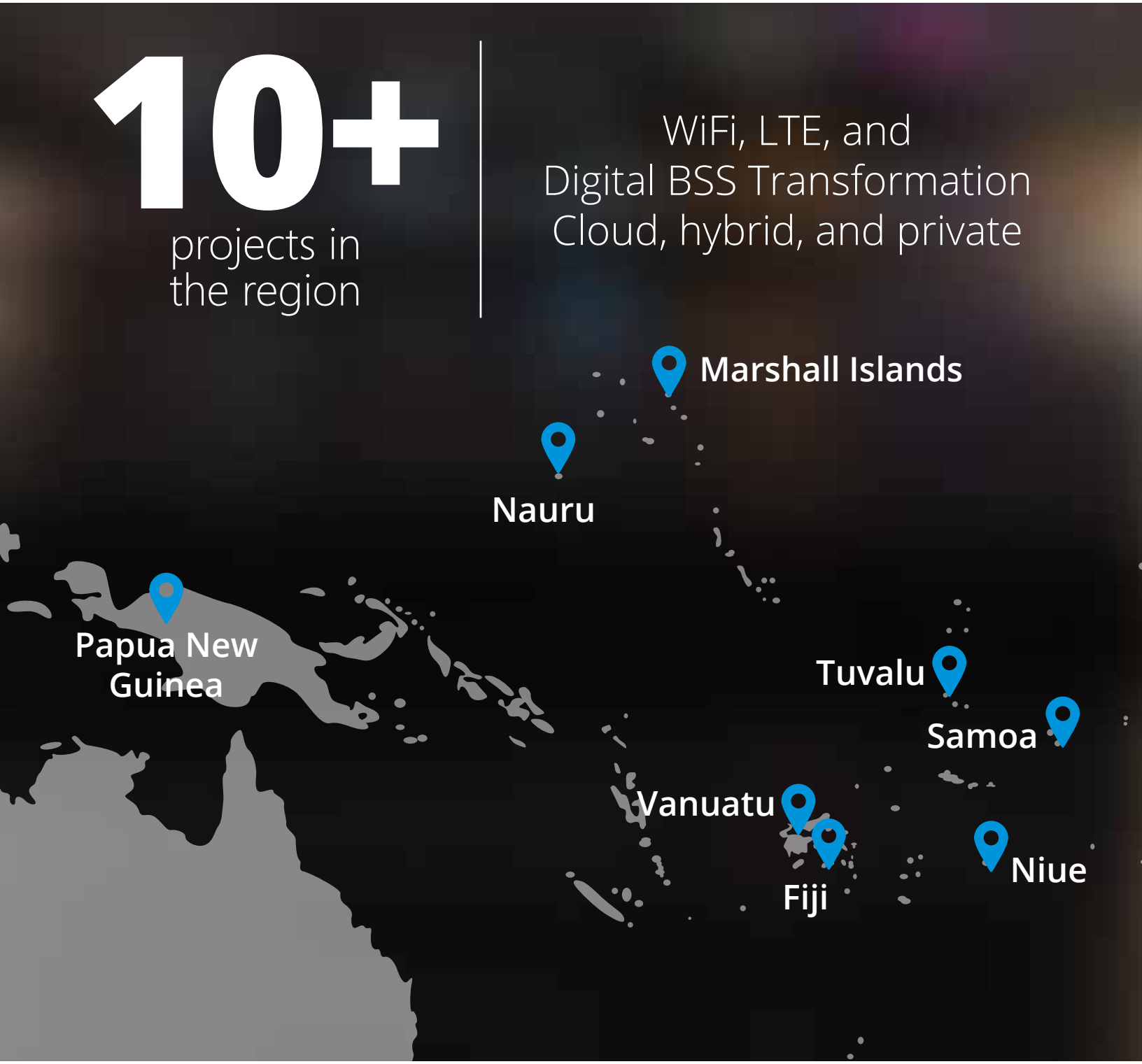
Years of engagement across seven Pacific nations in ten projects provide Alepo with unparalleled insights into market realities. Projects are run lean with a focus on clear deliverables and business outcomes. The resulting solutions have allowed operators to attract both subscribers and casual users with a superior experience that maximizes return for minimum risk.

Alepo's Presence
in the Pacific Islands

Alepo makes next-generation data opportunities a reality, delivers advanced software solutions and services that enable CSPs in the Pacific Islands to accelerate revenue growth, market share, and business success on all-IP networks

10+
projects in the region

WiFi, LTE, and
Digital BSS Transformation
Cloud, hybrid, and private



An Alepo
Success Story

FAST FACTS

Client:
National Telecommunications Authority

Operating Region:
Marshall Islands

PROJECT OVERVIEW

Marshall Islands National Telecommunications Authority (NTA), a private corporation with significant government ownership, offers domestic and international voice, data and internet services. Its mobile offerings were previously limited to basic voice and SMS. To expand its portfolio and offer mobile data, it needed to upgrade the legacy 2G GSM network to 4G LTE and WiFi. After successful delivery of the first project, NTA again selected Alepo to deploy fully converged billing for fixed and mobile services and a complete business support system (BSS).

OPERATOR REQUIREMENTS

- Transform NTA's mobile GSM network from 2G to 4G LTE and WiFi for faster and more reliable connectivity
- Reduce time to market (TTM) by ensuring real-time integration with elements that at the time, were being provisioned manually
- Improve the ability to launch personalized policy-driven offers for all types of customers
- Improve customer interactions using the dynamic web and mobile service channels
- Collaborate on advanced business cases it could introduce in the network
- Deploy a single converged billing solution to manage and monetize fixed and mobile service offerings
- Migrate their existing 2G, PSTN, ADSL, WiFi, and IPTV to Alepo's fully convergent BSS platform

SOLUTION HIGHLIGHTS

- 'Data on the go' plans helped NTA meet its goal of introducing a faster, always-connected network and data experience in the country.
- Enhanced ability to introduce innovative service bundles (voice, SMS, and data) and personalized data plans improved the Cx for subscribers.
- Convergent BSS platform for various services offered greater flexibility and eliminated the dependency on multiple legacy platforms, lowering the total cost of ownership.
- Single converged billing solution helped quickly design and launch nuanced policy-driven bundles such as on-demand bandwidth, family plans, location-based offers, and more.
- Alepo's web self-care and mobile app for Android and iOS enabled NTA's customers to independently complete tasks such as recharge, plan changes, and so on.

> "With our legacy system, we found it difficult to respond in a timely manner to evolving customer needs. With Alepo's solution, however, we are primed to respond to market changes as soon as they appear.
>
> - Thomas Kijiner Jr.
> *President and CEO, Marshall Islands National Telecommunications Authority*

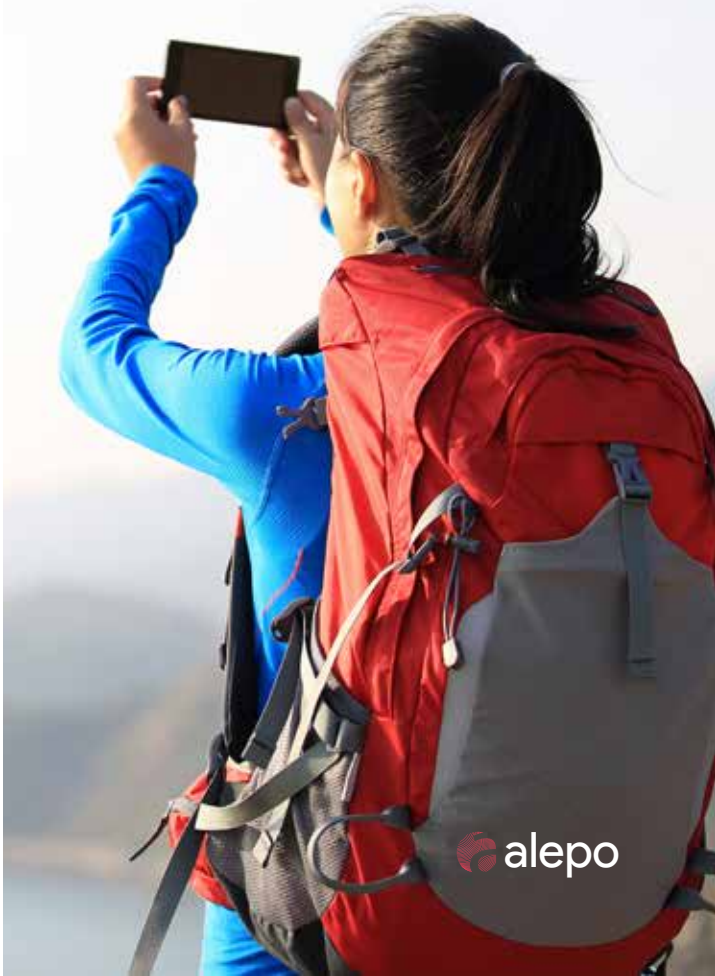
PROJECT OUTCOMES

Higher revenue and ARPU:
NTA launched several services, data bundles, and highly personalized offers.

Reduced strain on customer care:
With the introduction of mobile self-care, NTA became one of the first providers in the region to empower customers to be self-reliant.

Lowered OPEX and CAPEX:
This was achieved thanks to a convergent BSS platform, including web and mobile self-care and a single billing solution.

Improved performance:
WiFi with 4G LTE liminated the challenges of legacy ADSL connectivity, increased network coverage, and provided a high-speed data experience.



An Alepo
Success Story

FAST FACTS

Client:
Telecom Niue

Operating Region:
Niue

PROJECT OVERVIEW

Telecom Niue's mission is to ensure affordability, reliability, security, and high-quality telecommunication services anytime, anywhere. In keeping with this mission, the operator wanted to launch 4G services, VoLTE calls and digitized bill payment for residents and tourists. They also wanted to migrate their legacy PSTN and ADSL subscribers to Alepo's Digital BSS to gain advanced offline charging and CRM capabilities.

OPERATOR REQUIREMENTS

- Launch 4G network using Alepo digital BSS platform with a six-month timeline
- Deploy a PCRF (Ro/Rx) for advanced monetization and control of data services, including prepaid billing
- Enhance subscriber experience with high-speed data, Voice over LTE (VoLTE) calls, digitize bill payment using web self-care and mobile application

SOLUTION HIGHLIGHTS

- 4G/LTE launched ahead of the six-month deadline
- Residents and tourists now have access to 4G speeds, competitive pricing, and advanced data services including VoLTE, and digital self-care such as online bill payment
- Highly flexible web self-care and mobile application enable the operator to launch innovative customized plans within minutes

PROJECT OUTCOMES

- **Significant revenue growth** and widespread adoption after launching 4G.
- **Increasing subscriber base:** Digital transformation, along with the introduction of modern services and plans, improved the customer experience, with more than 50% of the island's population signing on within a few months of launch.

> We were already impressed when Alepo met our stringent deadline without hiccups. And we continue to appreciate the quality and flexibility of their solutions.

- Brett Collier
4G Rollout Manager, Telecom Niue

An Alepo
Success Story

telecom TUVALU

FAST FACTS

Client:
Tuvalu Telecommunications Corporation

Operating Region:
Tuvalu

PROJECT OVERVIEW

Tuvalu Telecommunications Corporation (TCC) is a state-owned enterprise that provides fixed-line telephone communications and internet services on each island, and mobile phone services on Funafuti, Vaitupu, Nukulaelae, Nanumea, and Niutao. TTC partnered with Alepo to launch LTE and WiFi networks.

OPERATOR REQUIREMENTS

- Launch LTE and WiFi
- Deploy real-time policy control and self-care app to help provide the best quality of service (QoS) and experience to subscribers
- Derive high return on investment by enabling the swift rollout of innovative use cases and digitization across Tuvalu

SOLUTION HIGHLIGHTS

Rapid monetization of newly deployed LTE and WiFi networks: Alepo's solution combined essential LTE core network functions, policy and charging control (PCRF), convergent charging and billing (OCS), and business support systems (BSS) onto a single high-performing platform

Reduced TTM: Innovative voice and data offers like application-based charging, bundled content, and apps, family and shared plans, and many other innovative use cases were rapidly launched

PROJECT OUTCOMES

Increased mobile broadband revenue:
TTC was able to rapidly bring LTE and WiFi plans to the market

Improved brand loyalty:
Digitization using Alepo web self-care and innovative data services using Alepo PCRF enhanced the customer experience

Reduced CAPEX and TCO:
Single converged BSS platform for all networks lowered costs

> "As we rolled out our LTE and WiFi networks we [turned to Alepo as we] needed not only return on our investment but also a partner with proven LTE and WiFi leadership, innovation, and deployment expertise.
>
> - Simeti Lopati
> *CEO for TTC*

ALEPO IS THE GO-TO TECHNOLOGY PARTNER FOR

Digicel

13 years
of longstanding partnership

3 markets
throughout the Pacific

+ more in other regions

ALEPO SOLUTIONS FOR PACIFIC ISLAND OPERATORS

Over the years, Alepo has fostered strong partnerships with Pacific operators. Serving as a system integrator for end-to-end network deployment and transformation including radio, core network, VAS, and IT billing systems, we are a one-stop-shop for greenfield as well as incumbent operators.

From 2G to the ongoing shift into mobile broadband and digital transformation, CSPs in the region continue to benefit from a range of our convergent offerings. We are committed to shaping an industry that affords operators of any size the capability to provide modern, secure, localized, and differentiated services.

We understand that every operator's needs are unique to their own market, and we're keen to share our experiences and insights on how our solutions can help you achieve your goals.

DIGITAL BSS TRANSFORMATION

Alepo's digital business support system (BSS) transformation replaces legacy systems to fully monetize digital experiences, improve network performance, support sophisticated business and operational processes. It enables rapid delivery, monetization, and management of the latest communications services while maintaining a low total cost of ownership.

The solution provides real-time charging and billing, digital CRM and self-care, with modules to manage revenue recovery, partners, billing and settlement for interconnect and roaming, fulfillment, and provisioning. A fully virtualized cloud-enabled framework with REST APIs and integration frameworks complete the package. In-built real-time analytics offers a holistic view of the business.

The carrier-grade digital BSS is pivotal in the implementation of next-gen technologies such as 5G and IoT, and also gives operators a fallback as 5G permeates. While helping operators become 5G-ready, the solution lets them offer a range of technologies including 2G, 3G, 4G, and WiFi. Circuit Switch Fall Back (CSFB) – an important capability in areas of the Pacific Islands that don't yet have 4G connectivity – ensures seamless fallback 2G and 3G for uninterrupted services.

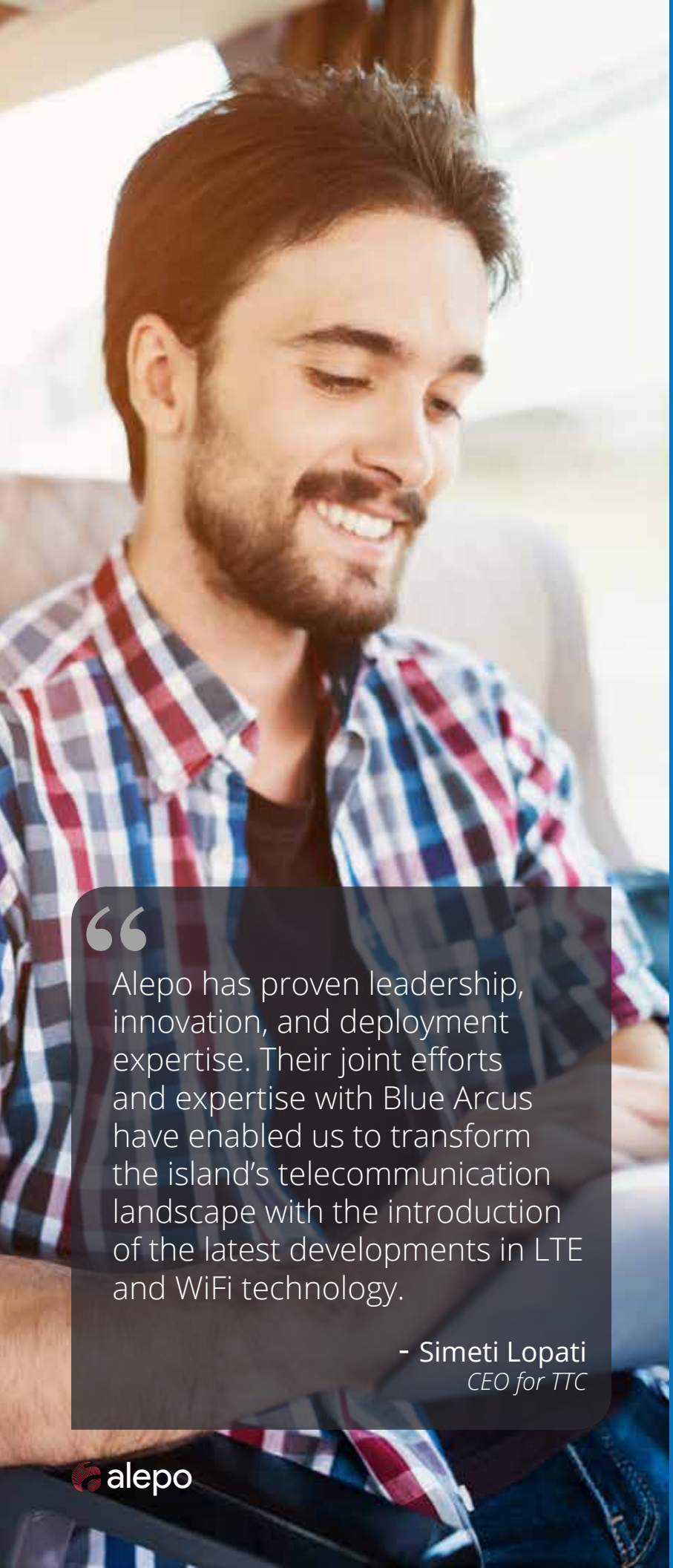
> "With our legacy system, we found it difficult to respond in a timely manner to evolving customer needs. With Alepo's solution, however, we are primed to respond to market changes as soon as they appear.
>
> - Thomas Kijiner Jr.
> *President and CEO, Marshall Islands National*

LTE Enablement

Alepo is an enabler of LTE services in the Pacific, having facilitated the introduction of 4G on many islands. Its end-to-end solution is perfect for greenfield mobile operators looking to rapidly deploy LTE services or any operator upgrading to LTE. On a single integrated platform, it combines a high-performance Evolved Packet Core (EPC), including advanced policy and charging control (PCRF, OCS); Alepo's Digital BSS, and Home Subscriber Service (HSS). It extends full support for the delivery, monetization, and customer experience of multiplay LTE services.

Alepo's LTE Enablement is cost-effective and easy to implement. It uses standards-based interfaces, best-of-breed hardware (with no vendor lock-in), and software with a modular and scalable architecture. Operators can rapidly launch offers with a predefined library of use cases. Microservice and documented open REST APIs ensure future-readiness.

> "Our goal was to modernize communication in Niue. The swift growth we've seen is a testament to how much our 4G project has been appreciated by our subscribers.
>
> - Brett Collier
>
> *4G Rollout Manager, Telecom Niue*



> Alepo has proven leadership, innovation, and deployment expertise. Their joint efforts and expertise with Blue Arcus have enabled us to transform the island's telecommunication landscape with the introduction of the latest developments in LTE and WiFi technology.
>
> - Simeti Lopati
> *CEO for TTC*

Carrier WiFi

WiFi remains critical to enabling access and coverage at a reduced cost. Even with 5G, it will continue to augment services and provide the last mile for many operators looking to compete with fixed-line broadband. Alepo's carrier WiFi solution caters for offload, monetization, and calling (VoWiFi). It can adapt to any partner strategy, helping operators expand their network, reduce congestion, and deliver value-based services that are compelling to customers, partners, and advertisers.

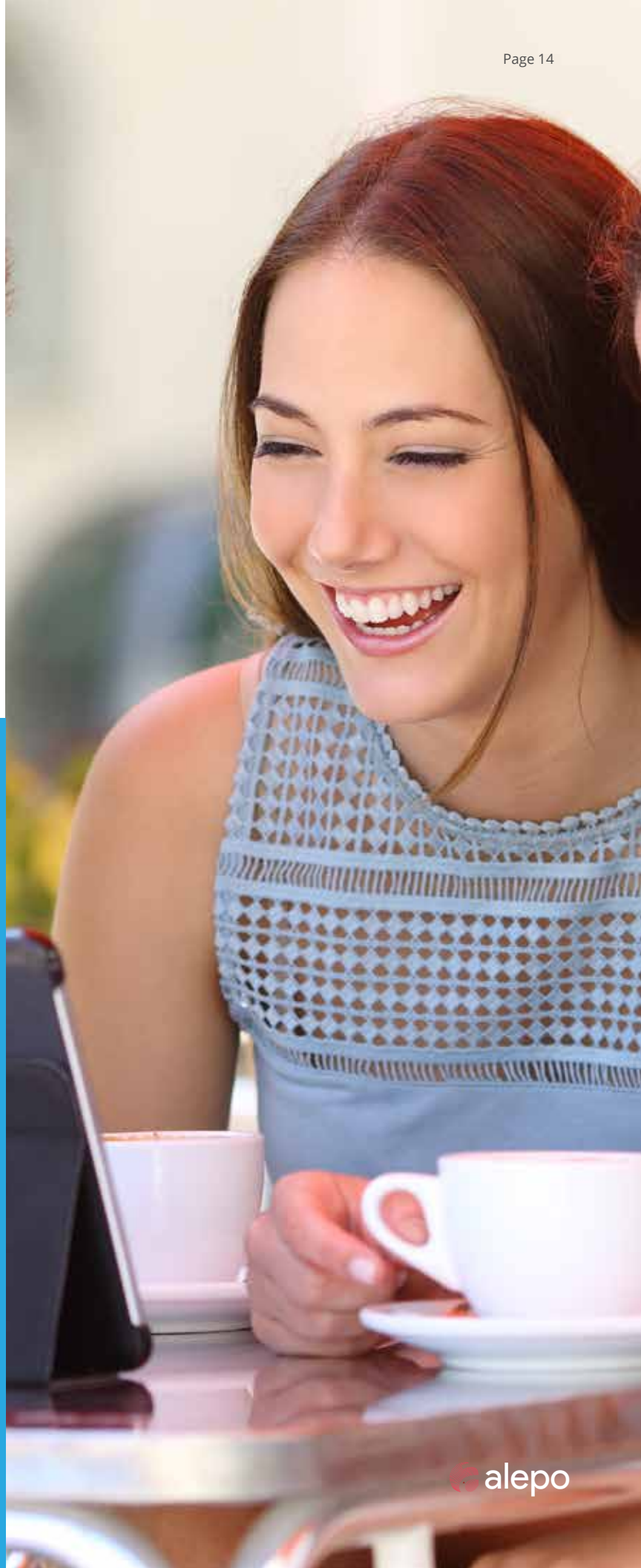
The vendor-agnostic solution works with any hardware or software stack. It is highly extendible and cloud deployable (with a virtualized on-premises option). The solution includes carrier AAA and the Alepo WiFi Service Management Platform (SMP). The SMP enables the rapid building of captive portals using common WordPress plugins and themes. It facilitates a wide range of monetization paths, including premium access through offers, vouchers, and subscriptions, and sponsored access using advertisements, surveys, analytics, and much more. All through a business-friendly intuitive interface unrivaled in the market.

Alepo's WiFi offload easily and securely supplements a cellular network's capacity, helping alleviate spectrum congestion and utilize bandwidth more effectively. It delivers consistent, high-speed data services over a mix of different network types while reducing delivery costs. Small Islands combined with a large tourist footfall make WiFi offload and monetization a way to both provide coverage and new monetization opportunities.

Data Charging

(Data OCS + Digital BSS)

Contextual data offers, bill collection interactions, personalized experiences, multichannel, and omnichannel subscriber-driven interactions are essential for market success. Alepo's advanced data charging facilitates these capabilities, covering the use cases that allow operators to compete on value as well as price. The solution can be implemented in a pure Alepo stack, or it can also be an adjunct to third-party core billing and charging capabilities. Standards are followed wherever they exist. A REST API gateway simplifies integration with non-standards-based network elements.



> Alepo's flexible and robust new solution is designed to enable us to offer customers enhanced flexibility and capabilities to launch new services easily.

- Thomas Kijiner Jr.
President and CEO, Marshall Islands National Telecommunications Authority

AAA Transformation

A modern AAA is pivotal to most digital transformation strategies. Alepo's class-leading carrier AAA empowers service providers to optimize network performance for wireline, WiFi, and 3GPP mobile networks alike.

CSPs can create new business plans and bring innovative products to market quickly. The feature-rich product can be implemented without disrupting existing services. Its open and flexible architecture allows rapid and cost-efficient deployment, including integration with third-party and legacy systems.

Newer compilers and programming methodologies improve network capacity. Advanced features such as proactive alerting, automated recovery, as well as offline modes, assist in ensuring a more resilient network. Multifactor authentication using any attributes of the session not only improves security but increases performance and efficiency.

For xDSL and other wireline networks, AAA infrastructure serves as an important service and policy control framework, enabling internet service providers to control how their subscribers access and consume IP data services.

The AAA can be deployed as standalone and is also an adjunct to Alepo WiFi SMP or Digital BSS.

> "Alepo's solution gives us the flexibility necessary to tailor plans exactly to the changing needs of our customers. This ultimately reinforces the quality and reliability of our products and services.
>
> - Christian Fruean
> *CEO, Digicel Samoa*

Mobile Financial Services (MFS)

Alepo's MFS is a private blockchain-secured platform that offers unparalleled levels of auditability and transaction integrity.

Operators can create a digital money ecosystem using any combination of the modular services, such as microcredit, microloans, a credit scoring engine, and promotions. One or more of these modules can also be integrated with an existing ecosystem.

The future-proof platform is extendible and employs open RESTful APIs to facilitate integrations with third-party as well as Alepo products. It is cloud-enabled and virtualized, offering the flexibility to be deployed on cloud, on-premise or as a hybrid.

Access channels include a mobile app for iOS and Android, web, USSD, QR codes, cards, and bulk upload.

The platform also offers interoperability, enabling transactions between different mobile money systems.

5G Core

Alepo supports both a gradual and rapid transition to implementing and monetize 5G, offering key components of the 5G core, consisting of a robust authentication framework and other components as well as a 5G-ready digital BSS.

Alepo's 5G core uses a service-based architecture, open REST APIs, and is fully virtualized. For authentication, it combines AUSF, UDM, UDR, HSS/HSS-GW to provide secure, flexible, and scalable authentication framework.

The solution supports the unified management of 4G (EPC, IMS), C-IoT, and non-3GPP networks (such as WiFi) along with 5G. 4G mobile operators with a 5G-compatible core can deploy 5G radio while leveraging their existing 4G deployment.

Operators not looking to move to 5G can bridge the gap by creating a modern omnichannel experience for subscribers, incorporating WiFi offload into their network, and supporting unique enterprise offerings around IoT.

About Alepo

Alepo makes next-generation data opportunities a reality, creating advanced software solutions and services that enable global communications service providers to accelerate revenue growth, market share, and business success on fixed and mobile broadband networks. For over a decade, Alepo has been the go-to technology partner for all things data at leading service providers.

Established in 2004, Alepo is a mature technology solutions provider based in Austin, Texas, with a presence in all regions of the world.

For more information, please visit *www.alepo.com*

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