PACIXP: Transforming Internet Connectivity Across the Pacific Islands

Exploring the evolution and implementation of PACIXP to enhance internet connectivity for Pacific Island nations, driving digital transformation and economic growth.

Transforming Internet Connectivity in the Pacific Islands

Transforming Internet Connectivity in the Pacific Islands

PACIXP is a groundbreaking initiative focused on improving internet connectivity across the Pacific Islands. Designed specifically for the NOG/IGF community, this presentation will delve into the vision for a continental-scale Internet Exchange, the challenges faced in current traffic routing, innovative solutions proposed by PACIXP, and the opportunities that lie ahead for regional digital transformation.

Continental-Scale Internet Exchange

Targeting Samoa and Fiji First

Leveraging Infrastructure for Improvement

Vision for Internet Connectivity

Continental-Scale Internet Exchange

PACIXP aims to establish a continental-scale Internet Exchange, enhancing connectivity among Pacific Island nations. This ambitious initiative seeks to create a robust digital infrastructure that fosters cooperation and collaboration among the islands.

Targeting Samoa and Fiji First

The initial focus on Samoa and Fiji serves as a foundation for broader connectivity, with plans to extend services to Tonga, Vanuatu, and other nations. This phased approach ensures a scalable and sustainable model for regional internet infrastructure.

Leveraging Infrastructure for Improvement

By leveraging distributed peering infrastructure and utilizing existing submarine cable capacity, PACIXP aims to significantly improve internet performance and reduce costs, ultimately driving digital transformation across the region.

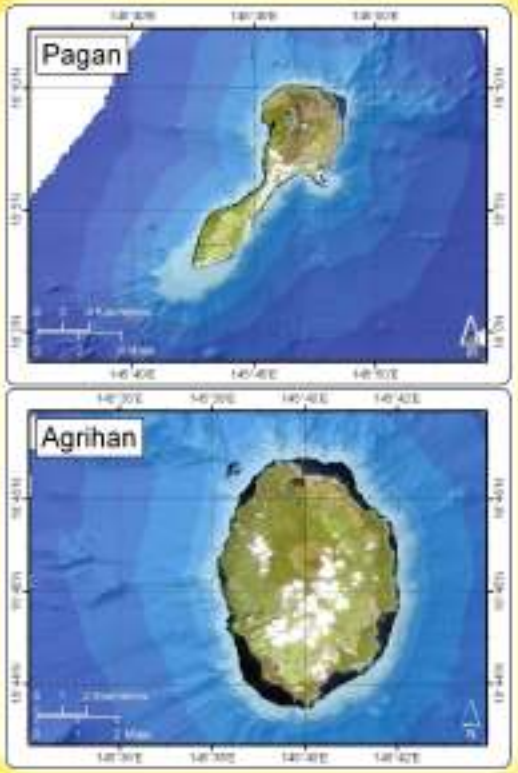
Inefficient Routing Paths

Traffic routing among Pacific Island nations is highly inefficient, leading to increased latency and costs. For example, traffic between neighboring islands often reroutes through Australia, Hawaii, or even North America, resulting in unnecessary detours. Tonga, instead of utilizing natural peering in Fiji, routes its data through Sydney, while Samoan traffic often traverses to Hawaii or makes multiple crossings via Japan, compounding the delays.

Consequences of Current Routing

This inefficient routing system incurs high latency, with round-trip times between neighboring islands reaching 180-250ms. Additionally, the reliance on distant routing increases transit costs significantly, creating a financial burden for Internet Service Providers (ISPs). Furthermore, this structure makes the network vulnerable to outages, hampering digital transformation efforts in the region.

Current State of Internet in the Pacific



Excessive Latency

Round-trip times in the Pacific range from 180 to 250ms, significantly hindering user experience and connectivity.

High Transit Costs

ISPs face high costs for international transit, which restricts their ability to offer competitive and efficient services.

Underutilized Infrastructure

Despite existing submarine cables, many remain underutilized, contributing to inefficiencies in internet service delivery.

Overview of PACIXP Solutions

Distributed Internet Exchange Points

PACIXP's distributed Internet Exchange Points will be set up primarily in Fiji and Samoa, creating a robust backbone for regional connectivity. This infrastructure will be crucial in establishing a collaborative digital environment across the Pacific Islands.

Industry-Standard IXP Infrastructure

By implementing industry-standard Internet Exchange Point (IXP) infrastructure, PACIXP will promote efficient data routing and minimize latency, ultimately enhancing the user experience for residents and businesses across the Pacific.

Direct Peering Between Networks

Direct peering between Pacific networks will eliminate unnecessary transit routes, drastically reducing costs and improving performance. This direct connectivity is key to fostering local internet ecosystems and supporting regional development.

Utilizing Submarine Cable Capacity

Activation of currently underutilized submarine cable capacity will allow for additional bandwidth and improved reliability, addressing the current issues of congestion and providing room for future growth in internet usage.

Distributed Internet Exchange Points

PACIXP's distributed Internet Exchange Points will be set up primarily in Fiji and Samoa, creating a robust backbone for regional connectivity. This infrastructure will be crucial in establishing a collaborative digital environment across the Pacific Islands.

Industry-Standard IXP Infrastructure

By implementing industry-standard Internet Exchange Point (IXP) infrastructure, PACIXP will promote efficient data routing and minimize latency, ultimately enhancing the user experience for residents and businesses across the Pacific.

Direct Peering Between Networks

Direct peering between Pacific networks will eliminate unnecessary transit routes, drastically reducing costs and improving performance. This direct connectivity is key to fostering local internet ecosystems and supporting regional development.

Utilizing Submarine Cable Capacity

Activation of currently underutilized submarine cable capacity will allow for additional bandwidth and improved reliability, addressing the current issues of congestion and providing room for future growth in internet usage.

Project Timeline for PACIXP

A structured overview of the key phases and milestones in the PACIXP initiative to enhance internet connectivity across the Pacific Islands.

Phase 1: Months 1-3

Foundation and market analysis with issuance of RFI to submarine cable operators, technical architecture design, and governance framework development.

Phase 2: Months 4-8

Initial deployment phase in Fiji and Samoa, involving infrastructure deployment, onboarding of initial participants, and establishment of operational procedures.

Phase 3: Months 9-15

Expansion planning phase with a focus on performance optimization and potential expansion to Tonga and Vanuatu, alongside capacity building programs.

Phase 4: Months 16-24

Sustainability and growth phase, transitioning to a participant-supported model while assessing impacts and conducting long-term planning.

Phase 1: Months 1–3

Foundation and market analysis with issuance of RFI to submarine cable operators, technical architecture design, and governance framework development.

Phase 2: Months 4-8

Initial deployment phase in Fiji and Samoa, involving infrastructure deployment, onboarding of initial participants, and establishment of operational procedures.

Phase 3: Months 9-15

Expansion planning phase with a focus on performance optimization and potential expansion to Tonga and Vanuatu, alongside capacity building programs.

Phase 4: Months 16-24

Sustainability and growth phase, transitioning to a participant-supported model while assessing impacts and conducting long-term planning.

Project Timeline for PACIXP

A structured overview of the key phases and milestones in the PACIXP initiative to enhance internet connectivity across the Pacific Islands.

Phase 1: Months 1-3

Foundation and market analysis with issuance of RFI to submarine cable operators, technical architecture design, and governance framework development.

Phase 2: Months 4-8

Initial deployment phase in Fiji and Samoa, involving infrastructure deployment, onboarding of initial participants, and establishment of operational procedures.

Phase 3: Months 9-15

Expansion planning phase with a focus on performance optimization and potential expansion to Tonga and Vanuatu, alongside capacity building programs.

Phase 4: Months 16-24

Sustainability and growth phase, transitioning to a participant-supported model while assessing impacts and conducting long-term planning.

Robust Technical Infrastructure of PACIXP

PACIXP's technical infrastructure is designed to ensure efficient and reliable connectivity across the Pacific Islands. It features a distributed layer-2 fabric connecting multiple physical locations, allowing for seamless data exchange. The implementation of route servers with RPKI validation enhances security and routing efficiency. Additionally, a high-capacity 100GE core infrastructure supports diverse participant connections, facilitating higher bandwidth and reduced latency. Comprehensive traffic analysis and DDoS mitigation strategies are integral to maintaining operational integrity and resilience.

Expected Impact of PACIXP on Connectivity and Economy

Reduction in Round-Trip Times

PACIXP aims to significantly enhance internet performance by reducing regional round-trip times to below 80ms, compared to current latencies of 180–250ms. This improvement will provide a faster and more reliable internet experience for users across the Pacific Islands.

Localization of Traffic

By localizing over 35% of current traffic that transits outside the region, PACIXP will enhance regional connectivity and reduce dependency on overseas routes, fostering a more resilient internet infrastructure.

Economic Savings and Job Creation

The economic benefits of PACIXP are substantial, with projected annual savings of $1.3–1.8 million USD in transit costs. This reduction will enable the development of new regional digital services and stimulate local economies by creating technical jobs and opportunities.

Reduction in Round-Trip Times

PACIXP aims to significantly enhance internet performance by reducing regional round-trip times to below 80ms, compared to current latencies of 180-250ms. This improvement will provide a faster and more reliable internet experience for users across the Pacific Islands.

Localization of Traffic

By localizing over 35% of current traffic that transits outside the region, PACIXP will enhance regional connectivity and reduce dependency on overseas routes, fostering a more resilient internet infrastructure.

Economic Savings and Job Creation

The economic benefits of PACIXP are substantial, with projected annual savings of $1.2–1.8 million USD in transit costs. This reduction will enable the development of new regional digital services and stimulate local economies by creating technical jobs and opportunities.

Organizational Structure of PACIXP

Legal Entity Registration

PACIXP is established as a legal entity registered in New Zealand, ensuring compliance with local regulations.

Non-Profit Organization

Operating as a non-profit organization, PACIXP is dedicated to enhancing internet connectivity in the Pacific Islands.

Inclusive Governance Structure

The governance structure includes a committee of technical experts representing various Pacific nations, promoting diverse perspectives and expertise.

Organizational Structure of PACIXP

Legal Entity Registration

PACIXP is established as a legal entity registered in New Zealand, ensuring compliance with local regulations.

Non-Profit Organization

Operating as a non-profit organization, PACIXP is dedicated to enhancing internet connectivity in the Pacific Islands.

Inclusive Governance Structure

The governance structure includes a committee of technical experts representing various Pacific nations, promoting diverse perspectives and expertise.

Technical Mentorship

Technical mentorship is essential for the success of PACIXP. The Internet Association of Australia and the New Zealand Internet Exchange provide crucial guidance on industry standards and best practices, ensuring that the PACIXP initiative is robust and effective. Their expertise will help in the establishment and operationalization of the Internet Exchange Points (IXPs).

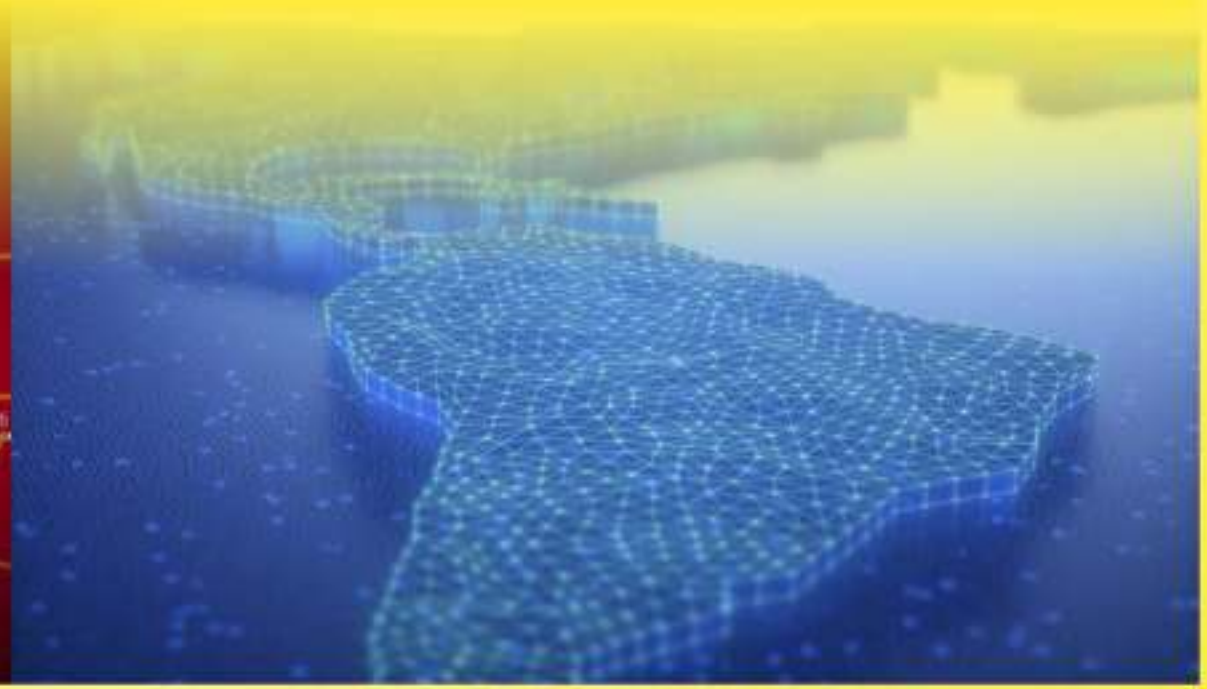
Regional Support and Implementation Partners

Regional support from organizations like APNIC and ISOC strengthens the initiative by providing resources, training, and advocacy for internet governance and development. These partnerships facilitate knowledge sharing and capacity building within the Pacific region, while implementation partners, including national telecommunications operators and submarine cable operators, are vital for the physical establishment of the infrastructure required for PACIXP.

The Tiered Implementation Approach of PACIXP

The Tiered Implementation Approach of PACIXP

PACIXP's tiered implementation strategy is designed to realize the vision of a distributed Internet Exchange with international connectivity. This approach is adaptable, starting with isolated points of presence if necessary, and emphasizes phased growth that responds to the evolving market conditions in the region.



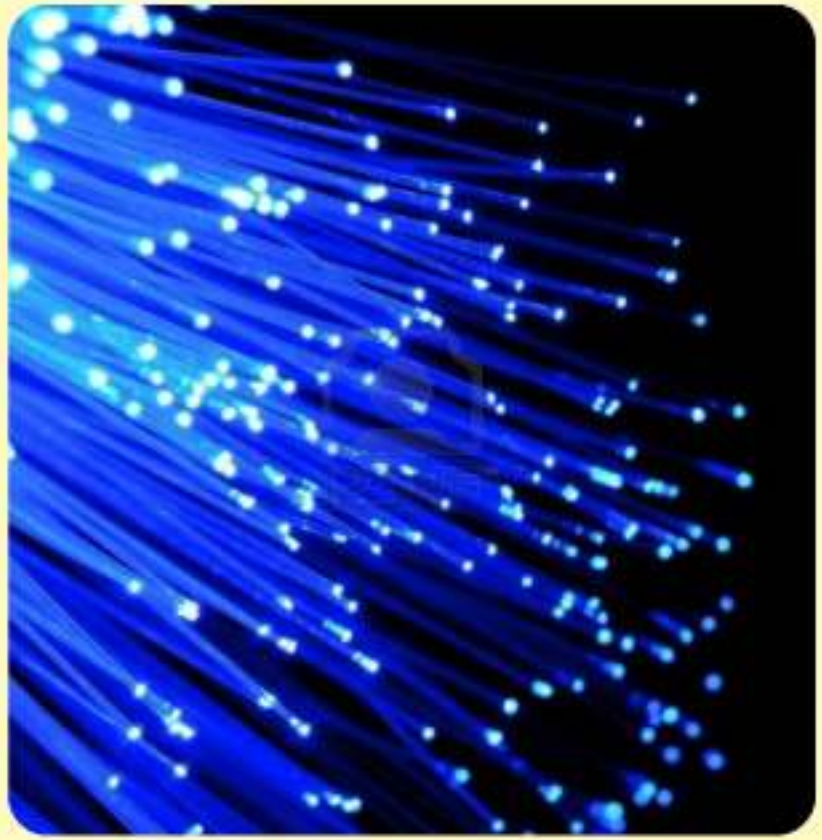
Key Benefits for Participants

Reduced Transit Costs for ISPs

ISPs participating in PACIXP can achieve over 25% savings on transit costs, enabling them to offer more competitive pricing and improved service offerings. The direct connectivity facilitated by PACIXP enhances the overall internet experience for end-users, reducing latency and improving reliability.

Improved Performance for ISPs

With PACIXP's infrastructure, ISPs can enhance their service performance significantly, providing faster and more reliable internet access to customers. This improvement in service quality fosters customer satisfaction and loyalty, helping ISPs retain and grow their user base.



Enhanced User Experience for Content Providers

Content providers will benefit from a better user experience due to lower latency and higher reliability of connections. This translates to quicker loading times and seamless streaming, which are essential for content consumption in today's digital world.

Reduced Delivery Costs for Content Providers

Participation in PACIXP allows content providers to reduce delivery costs significantly. They can establish a direct presence in Pacific markets, eliminating the need for multiple deployments and enhancing operational efficiency.

Direct Access to Pacific Markets

By leveraging PACIXP, content providers gain direct access to Pacific markets, allowing them to effectively cater to local audiences. This access enables them to tailor their offerings to meet regional preferences and needs, enhancing market penetration.

Ways to Get Involved with PACIXP

Join as a Peering Participant

By joining as a peering participant, organizations can connect their networks directly to PACIXP, leading to improved performance and reduced costs.

Contribute Technical Expertise

Organizations can contribute their technical expertise to enhance the PACIXP initiative, helping to build a robust regional internet infrastructure.

Provide Infrastructure Support

Infrastructure support can come in the form of hosting PACIXP equipment, providing connectivity, or sharing technical resources, which is crucial for the project's success.

Ways to Get Involved with PACIXP

Join as a Peering Participant

By joining as a peering participant, organizations can connect their networks directly to PACIXP, leading to improved performance and reduced costs.

Contribute Technical Expertise

Organizations can contribute their technical expertise to enhance the PACIXP initiative, helping to build a robust regional internet infrastructure.

Provide Infrastructure Support

Infrastructure support can come in the form of hosting PACIXP equipment, providing connectivity, or sharing technical resources, which is crucial for the project's success.

Join Us in Transforming Connectivity

Join Us in Transforming Connectivity

Now is the pivotal time to enhance internet connectivity in the Pacific Islands. With a strong foundation and established partnerships, your involvement can help shape a collaborative effort to improve regional digital infrastructure and achieve digital sovereignty.

Stay Connected with PACIXP

For further inquiries and collaborations, please visit our official website or reach out via email. Your questions and support are vital as we strive to enhance internet connectivity across the Pacific Islands.

PACIXP: Transforming Internet Connectivity Across the Pacific Islands

Exploring the evolution and implementation of PACIXP to enhance internet connectivity for Pacific Island nations, driving digital transformation and economic growth.