

Bringing the Internet to the I-Kiribati.

## Background

TSKL (Telecom Services Kiribati Limited) is the Republic of Kiribati's sole, Government-owned, telecommunications provider. Although the thirty-two atolls that comprise Kiribati are dispersed across over three million square kilometres of Pacific Ocean and three timezones, the majority of the I-Kiribati population lives close together on the capital island of South Tarawa.

TSKL provides telecommunications services to Tarawa and across Kiribati – from satellite connectivity to the outside world to wireless and wired links to customers, as well as telephony and GSM services. TSKL's customer base includes companies and government ministries (connected via copper wire); customers and companies connected through the Coconut Wireless network, and a small number of ADSL users.

## Challenge

Tarawa's existing satellite backhaul link needed to be upgraded to address the challenges TSKL was facing in providing fast and affordable telecommunications, including:

- Limited bandwidth to customer networks, whose Internet traffic was limited to low rates to prevent the satellite link from being overwhelmed with demand.
- Inefficient satellite backhaul for ADSL traffic relying on a dedicated satellite link, where available capacity was often underutilised.
- The delays inherent in relying on a geostationary satellite for Internet connectivity with the outside world.

What was needed in these circumstances was a solution, adopting best industry practices and technology to better distribute capacity and optimize and accelerate Internet traffic to improve the overall communications capabilities and user experience of TSKL's customers.

## Solution

Pactel International addressed TSKL's communications challenges by re-engineering the traffic control mechanisms supporting the existing satellite backhaul link from South Tarawa.

Pactel began this project with the objective of mitigating the network bottleneck of the satellite link to improve performance. This required integrating a selection of traffic management and link optimisation solutions into TSKL's network.

Pactel took a consultative on-site approach, by analyzing TSKL's existing network to determine its limitations, providing recommendations to overcome or ameliorate these limitations, testing, installing and integrating new equipment, and finally, upgrading the traffic management technology that enhances the satellite link performance.

Pactel integrated WAN acceleration technology into the new infrastructure to improve performance and the experience of using a satellite link. Pactel's satellite engineers tested the acceleration equipment, which proved to have a positive effect on the performance of downloads over the satellite link. Through testing, they were also able to show that even small customers on Coconut Wireless were able to feel the effects and benefits of this WAN acceleration.

During the installation process, Pactel's engineers encountered an issue with the existing traffic shaper prioritizing traffic and providing Quality of Service (QoS), which ceased passing the network traffic, leading to a customer outage. The device, which had previously encountered similar issues and was ready for decommissioning was supplanted and replaced by a new and enhanced model. This new QoS platform is managed by Pactel with TSKL being able to view the configured rules, monitor performance, and request any shaping changes from Pactel. The new managed-device paradigm enables Pactel's engineers to provide advice and expertise on bandwidth management and network performance

Pactel's satellite engineers introduced the shaping concepts of Committed Information Rate (CIR) and Burst Information Rate (BIR)\*\*\* *[add disclaimer: The committed rate is the minimum guaranteed link rate that a customer can always have to itself. The burst rate is the maximum that a customer can be given – but burst capacity is a pool of bandwidth that is shared between multiple customers by the shaper, and a single customer can only reach its burst limit if no other users are consuming burst capacity]*

The individual pool BIR rates were set for the Wireless Coconut, ADSL and Copper Wire networks, allowing users to share network capacity and satellite bandwidth within their groups. The benefit of this bandwidth allocation method is two-fold: no individual group (pool) can dominate the overall link capacity with its needs and there is no idle or wasted bandwidth as excess burst capacity can always be successfully reallocated to another group that needs it.

“It is essential that we talk regularly with TSKL's customers, including the government ministries, about their communication needs”, says Dr Lloyd Wood, Engineering Manager at Pactel International. “A good way to learn a customer's needs is to simply leave one selected customer “unshaped” for a period of time and then compare the customer network traffic during that period with traffic while shaped at the agreed rate. This information can be used to re-evaluate the customer's needs and make necessary network adjustments. The process can be repeated every few months to ensure that TSKL responds rapidly to and continues to meet the changing needs of its customers,” Dr Wood added.

## Results

Pactel improved the performance of the network bottleneck for TSKL and for the entire island of Tarawa. The results are improved internet access, decreased download times, and more efficient, higher-performing satellite trunking, leading to better communications for the islanders.

The ability to reuse shared bandwidth, with a guaranteed burst rate, provides TSKL with enhanced operational efficiency. The new technology integrates well with the upgraded network, and allows flexibility to adapt to future needs.

For the end-users, the improved network capabilities are yielding the following benefits:

- Better utilization of the satellite link, with pooling of shared capacity allowing more reuse of a limited resource and higher speeds for customers.
- Better recognition of the traffic needs of companies and government ministries
- Increased traffic throughput and decreased download times, resulting in an improved online experience across all user groups

“As a reputable service provider with proven responsiveness and expertise, Pactel International has assured TSKL that we can expect the best quality of service when it comes

to network performance”, said **Teannaki Tongaua**, CEO of TSKL. “Pactel’s post-installation support and ongoing network management ensures that our use of the satellite link will be continuously optimised”, added Mr Tongaua.

“Customers such as TSKL are our primary focus in the Pacific Islands, We recognise the importance of providing communication infrastructure that a whole island can depend upon. This is another completely managed solution, attuned to customer needs, that Pactel International is proud to add to our service portfolio,” commented Peter Dowers, Voice and Data business development manager for Pactel International.

## Moving Forward

Throughout the multi-year agreement Pactel will continue to monitor the existing satellite link and its traffic, and will provide recommendations and adjustments to the traffic shaping and acceleration technology as the traffic needs of TSKL’s customers and of Tarawa change and grow.

TSKL is anticipating expanding its services to cover an additional twenty-two atolls as well as the rollout of their 3G network. Pactel is looking forward to responding to TSKL’s future needs in a similar proactive fashion.

## About Pactel International

Founded in 2003, Pactel International is an Australian-owned global satellite communications provider, supplying connectivity across all areas of the Asia-Pacific region.

Our offerings range from commercial and corporate to carrier-grade networks that support services such as Internet, Private WAN, Telephony and Voice and Mobile GSM.

Pactel’s primary mission is to provide remotely-based businesses and communities with peace of mind by keeping them connected: constantly, reliably and efficiently. Accordingly, we are committed to providing a communication infrastructure that reflects the diversity of our end-user requirements: from small businesses to resource sector through to resellers and wholesalers.

The Company’s competitive advantage is highlighted through complete service customisation, 24x7 network monitoring and customer support, and superior quality and reliability of service and equipment experiencing the harsh environments and extreme weather conditions of the Asia-Pacific Region.

## About TSKL

TSKL is the sole telecommunications provider to the Republic of Kiribati, owned by the government, and the people, of Kiribati. TSKL’s mission is to provide easy and affordable access to reliable telecommunication services for all I-Kiribati.