ISLAND OF NIUE

CASE STUDY SWITCHVOX

OVERVIEW

They service some of the most remote places on Earth — islands in the Pacific Ocean where you would not find a mobile phone network at all, or the Internet readily available — that is, not until Challenge Networks took Asterisk to a whole new level. In the past four years, Challenge Networks has sold the emergent open source software to telecom companies on many of the lesser-known Hawaiian Islands; Papua, New Guinea; Samoa; the island country of Vanuatu; and the island nation of Niue.

The Power of Asterisk Reaches the South Pacific, Connecting Obscure Island Nations with the Rest of the High Tech World

Located 1,500 miles northeast of New Zealand amidst a triangle formed by Tonga, Samoa, and the Cook Islands, the 100-square-mile self-governing nation of Niue is home to as many as 2,000 residents, most of whom are Polynesian islanders. In 2003, an Australian entrepreneur, concerned that having no access to the Internet was a detriment to Niue's economy, took steps to make Niue the first island nation to use Wi-Fi by providing it free to the people on a very limited basis in government office buildings. In 2004, a devastating cyclone destroyed most of the island's infrastructure, including the local hospital and hotel. The hit drastically crippled the island's primary means of income — tourism.

In hopes of boosting tourism and connecting the island technologically with the rest of the world, the New Zealand government allocated money in 2010, for the upgrade of Niue's public switched telephone network (PSTN) and transmission (Microwave) in order to cover as much of the remote areas around Niue as possible. Challenge Networks, a preferred Asterisk reseller located in Melbourne, Victoria, Australia provided the most flexible solution. Having installed Asterisk many times over the past four years in far away Pacific places, Challenge Networks, an international telecommunications equipment and service provider specializing in cellular networks for cost-conscious network operators; partnered with Lemko Corporation, a communications software firm based out of Schaumburg, IL. They replaced Niue's ancient telecommunications infrastructure, with Asterisk, the world's most widely used open source communications platform. It would prove to be no easy task.

“The project was fraught with logistical complications,” says Kamal Sabbagh, Challenge Network’s Telecommunications Engineer, “but the technical challenges alone were threefold. First, it was difficult to provide Niue Telecom with the latest technologies, and replace the existing infrastructure with the very limited funding provided. Also, we had to build simplified networks that the local staff, which was limited in experience, could maintain; and finally, the region is subject to serious weather, so we had to make the new infrastructure cyclone-proof, to avoid the kind of destruction they endured in 2004.”

The Challenges

The Challenge Networks team organized a site visit and investigational review of the project in July 2010. “The outcome of that initial visit was distressing,” Sabbagh admits. The island’s only telecom provider, Niue Telecom, operated on 1980s technology, making it nearly impossible to find technical support and spare parts when the equipment broke down. Their legacy TDM/PSTN had limited capacity, and pieces of the infrastructure like the Multifrequency Compelled R2 Signaling System (MFC/R2) and Signaling System 5(C5) for international dialing was based on analogue technology that is 50 years old. Furthermore, their still-operational PBX dates to 1932. “This may be hard to believe,” muses Sabbagh, “but at this moment, they are still using that PBX, although we expect to decommission it in the near future.

“The funds we were allocated were barely enough to install up-to-date Microwave links, Nokia Siemens Network’s Multi Service Access Node (MSAN), to replace the PSTN, and provide ADSL. For the PSTN to function properly, it would take a full ten percent of the budget to find a mainstream vendor softswitch.”

Not yet figured into the budget was the need to replace an ailing AMPS network, which provided Fixed Cellular Terminals (FCT); PSTN-like access to remote areas where copper didn’t exist in the ground; and the lack of funding eliminated any possibility for upgrading Niue’s International Gateway (IGW), which would provide Niue with a much-needed updated Cellular network.

As Sabbagh explains, building an IP infrastructure from scratch on a remote island in the middle of the ocean, 3½ hours by airplane from the nearest metropolitan city, presented its own set of problems. For one, it took many boxes to get all the equipment, tools, and supplies to Niue. “There is only one flight per week from Auckland, New Zealand and by boat it could take a month,” he explains. “If you suddenly discovered you needed a special kind of screw or a different tool, you had to wait a week for the next flight. If you required any remote support or extra personnel, it is very expensive to fly them in for one or two days of work. To add insult to injury, by plane, you are traveling back and forth across the International Date Line, which gets very disorienting over time.”

The Asterisk Solution

According to Sabbagh, the Challenge Network team could not have made the project work within the budget given, had it not been for Asterisk. “We focused our design around Asterisk and utilized the power and flexibility of open source software everywhere it was possible,” says Sabbagh.

Challenge Networks and Asterisk were able to deliver Niue a voice and data network, an Internet Service Provider (ISP) module, Internet access to every home, and IP-based solutions across the board. Asterisk offered the perfect solution for the following reasons:

- Due to budgetary constraints and very costly logistics, Asterisk empowered Niue Telecom to maintain their own system without the need of an outside vendor or support mechanism.
- Because Asterisk software and the open source model is without cost, it freed up funding for upgrading all the existing systems
- The installation of a new GSM network was included with Asterisk, which replaced the AMPS system with its maximum 3-channel capacity, so it now reaches Niuens all across the island

By implementing Asterisk to run all of Niue’s PSTN, it’s flexibility has solved many problems:

- Niuens now have number portability around the island because Asterisk acts like a softswitch with real-time MySQL subscriber provisioning, and Call Detail Record (CDR) collection.
- Asterisk provides Round-robin (RR) queues for customer PBXs.
- Asterisk saves a lot of money providing an international Gateway with SIP trunks for international dialing with G.729/G.723/G.711/T.38 support. This means traditional carriers no longer dictate cost.
- Asterisk supports a SIP-MFC/R2 converter that integrates the legacy network with the new all-IP network, helping to ease the transition from the antiquated older system, over to the new system, eliminating the risk of critical error.
- Asterisk provides a Call Center PBX for the Network Operations Centre (NOC), where the International operator and Operator Assisted Calls (OAC) originate.

According to Sabbagh, Niue has taken a quantum leap in terms of technology. The biggest challenge he sees the island nation now facing, is maturing to the idea of having the power of IP and the Internet readily available. “We expect as the fiber cable around the island is complete, enabling the Niuens to have Fiber to the Curb (FTTC), the ADSL network will catch on. Then more people will have Internet in their homes, more businesses will start exploring the power of Asterisk, and IP-PBX’s will be more in demand,” says Sabbagh.

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