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Niue

Niue's .nu

Providing a Free Internet to an Isolated Nation

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Richard St. Clair is Chairman of the Pacific Islands Chapter of the Internet Society (PICISOC) and the technical manager for the Internet User's Society - Niue, the charitable foundation which administers .nu, the ISO-3166 country code Top Level Domain (ccTLD) associated with the island of Niue (pronounced New-way). When St. Clair first arrived in Niue in 1994, the telephone in his house had a crank on the side and his phone number was "two longs and a short" turn of the crank. Now, with funds provided by the global marketing of .nu, he has created a Niuean technological infrastructure and provides free dial-up and DSL Internet access for the Island's residents via a satellite connection to New Zealand.

With a population of about 1,800, Niue Island is one of the smallest countries in the world. The name "Niue" is derived from the loose Niuean language translation for "Look, there's a coconut." A self-governing state in free association with New Zealand, Niue is located in the South Pacific at 169 degrees West by 19 South. While often cited as being the largest coral atoll in the world, its land-mass of roughly 260 square kilometers (100 sq. mi.), which is about one and a half times the size of Washington, D.C., actually makes it one of the smallest countries. With its nearest neighbors, Tonga and Samoa, roughly 400 miles away, it is also one of the most isolated countries in the world.

The island's remoteness highlights both the need for global communication

WWW.NIUE.NU

Fiji

Niue

Tonga

NIUE

New Zealand

Uga (Coconut Crab)

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White Paper

and the inherent difficulties in attaining it. Connecting the island of Niue to the global Internet was both technically and economically difficult. However, the marketing of the ISO-3166 country code top-level domain (ccTLD) .nu, which is associated with Niue, has made it possible to provide the Niuean people with not only free island-wide Internet access, but also an Internet Café in the capital city of Alofi.

IN 1992, upon retiring from my position as a Silicon Valley geek-entrepreneur, I had visions of going to the California mountains, and fishing for trout. I lasted about a week before I was bored out of my mind. Since childhood I have always wanted to join the United States Peace Corps; seeking the opportunity to change my perspective on the world, I decided to join the Peace Corps. After the two-year application process, I was on my way to Nigeria. At the time I was due to head out, Nigeria was in the midst of civil war and, fearing a hostage situation, the Peace Corps would not let me go. The next assignment that arose was to go to Niue; I went as a bulldozer mechanic, since that's what they needed at the time.

The idea was to get away from computers, and, for a short time, that is what I was able to do. About three months into my term on Niue, though, someone from the government of Niue came down to the workshop where I was putting a transmission into a bulldozer, and asked me if I knew anything about computers because the system at the Treasury Department had crashed. So, of course, I went down and fixed it. This, however, meant that the cat was out of the bag;

they now knew that I was a computer guy. I soon transferred from the heavy equipment plant to the Administration Department and began to take care of their computer needs. I was a member of the first Peace Corps group dispatched to Niue to work with agriculture, business, education, and, of course, information technology in 1994. This was at a time when news of "this new Internet thing" was spreading throughout the Pacific. The people of Niue, like many others in the world at the time, had many questions about what the Internet, as a communications tool, could do for Niue.

THE ABILITY TO COMMUNICATE is important for Niueans because most Niueans do not live on the island of Niue. Many families separate as their members seek employment opportunities abroad. Most of the jobs on the island are for the government; not everyone wants to work for the government, or work in the public sector, so they move to other nations like New Zealand, Australia, and the United States. Right now, only about 10% of the Niueans in the world actually live in Niue. International communication is also a vital way to break through the isolation. The long-time residents of Niue recall that when the airport was built in the 1970s there was a mass exodus to New Zealand. International phone calls are expensive. It costs NZ$1.90 (US$1.08) a minute to call New Zealand, and NZ$4.20 (US$2.38) a minute to call most other places. Having a free communications system that anyone and everyone had access to would improve personal, as well as business and governmental, communications.

Unfortunately, the technology on the Island was not Internet friendly. There were close to 100 computers in various government departments, as well as a few private-sector

computer owners who used them mainly for word processing, accounting, and the occasional "Duke Nukem" computer game.

LOCAL TELEPHONE COMMUNICATION was, however, substandard. In most outer villages, there were small phones with cranks on the sides; my home phone number in Tamakautonga, which was south of Alofi, the capital, was "two longs and a short." In Alofi there were some touch-tone phones, but even these were not capable of any data transmission. The system was too noisy to carry data. While the connections may have sounded clear to a human ear, there was too much noise for the modems to communicate.

In late 1995 Telecom Niue upgraded the phone systems and the switching circuits that handle the local calls; the line noise was reduced and it was possible to consider electronic communications as a possibility for the Island. It did not take long for the locals to recognize the exciting opportunities that lay ahead.

As soon as it was possible to carry data on local phone lines after the Telecom Niue upgrades, it was time for the first steps. The ultimate goal was to build a network on Niue for the purpose of carrying Internet services. While there were no resources to connect any such network to the rest of the world, I recognized that sometimes things have to be done one step at a time.

January 1997 marked the debut of Niue's first computer network, which we called the Savage Island Network. This is in homage to the name that British explorer Captain James Cook gave the island when he landed in 1774. As he came ashore he encountered native people who threw a stone and a spear. Interpreting the actions negatively, he named Niue, "Savage Island." The name, however, is a misnomer. The native people saw Cook's arrival as trespass so they challenged Cook in a welcoming ritual by throwing a spear less than five paces to see if he could catch it and to test if he was coming in peace.

The Savage Island Network ran 24 hours a day, seven days a week and provided the first electronic communications of its kind on Niue. Because phone lines were rather scarce at the time, we managed to snag three lines for dial-ups to the system. The original system ran as a privately owned standard bulletin board system (BBS) and was configured as a local only (Intranet) e-mail, file server and BBS service.

Niue's government agency responsible for the internal administrative infrastructure was the primary user of that system. There were also a handful of private sector users interested in data communications. The only problem with the system, which was a nationwide Intranet, was that it was not connected to the rest of the world.

WITH ONLY 20-30 USERS, the privately owned Savage Island Network was the beginning of telecommunications development on Niue. It was a training tool, test bed, and learning environment for the local users, as well as those who assumed the challenge of things to come. While the need to be familiar with new technologies was part of its driving force, it was mostly driven by dreams of being connected to the real Internet.

After about a year, that network's workings were replaced with a 32-bit version of the WildCat Bulletin Board System. BBSes were the computer modem dial-up systems that were used before the Internet was popular. Since there was no Internet connection to the outside world at the time, it was the only system to choose. Fortunately, as a developer and user of BBS systems in the United States, I already had experience running and building them.
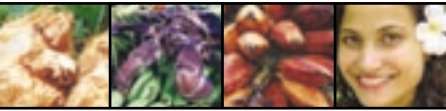
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With this system, the users found themselves thrust into the graphical world of the hypertext markup language (HTML), the language of the World Wide Web, and other vivid interfaces. This allowed us to be one step closer toward achieving the look and feel of the real Internet. Still, it was a local only BBS running file services, newsgroup bulletin boards, and e-mail.

As my Peace Corps term expired, the Niuean government requested that I stay as a permanent resident to develop the services as best I could with what resources I had at the time. I was given a choice of going back to California to fish for trout, or doing something useful that the people of Niue really wanted. The decision to stay was easy. Niue is now my home; like all Niueans, I have the New Zealand citizenship to prove it.

IN 1901, NEW ZEALAND ANNEXED NIUE; for 70 years Niue was under the protection of the British Empire. Then, in 1974, as part of a larger movement to liberate many of the small island nations, Niue was granted independence in free association with New Zealand. This means that Niue is self-governing, but its residents hold New Zealand citizenship

The BBS created an excellent training ground. People on Niue learned the concepts of using a modem and communicating over a telephone line with something other than their voice. It also familiarized them with browsers and sending and receiving messages. It was a superb practice tool for the larger Internet that was coming. The connection also allowed government departments to exchange data electronically without printing it, or traveling to other departments on the Island in a motor vehicle.

RUNNING THE SYSTEMS FROM THE LIVING ROOM of my house, there were plenty of failures from power surges, lightning, and creepy crawly things, like geckos and kangaroo rats, that made their way inside the machines. If a gecko, for example, crawls into a live power supply, it will explode when it gets to the high voltage heat sinks and will usually blow up the power supply in the process. Still, despite occasional failures, the value of the network was beginning to show; both network traffic and the user base constantly increased.

By 1997, the Savage Island Network had reached its limits on what could be developed without resources to connect it to the rest of the world. The days of the self-funded hobby were rapidly coming to an end, and there were no ideas, or resources that could be found to make that transition from a nationwide Intranet, to a full-time connection to the outside world.

As the technological infrastructure was being built, frequent meetings were held. The Government of Niue met with interested parties, which included business owners, computer enthusiasts, and anyone else who wanted to know what "telecommunications" was all about. The meetings showed that Niue was interested in the Internet as a communications tool, but had no resources to connect to it, or establish any kind of equipment to build an Internet infrastructure. It was simply too costly for a relatively small number of people to bear the cost of direct links to the outside world for the purpose of Internet services.

In 1997 the government of Niue declared that it had no funds to develop Internet Services and decided to delegate its development to the private sector. This decision did not come as a surprise. The govern-

ment's priorities at the time were tourism and developing private sector businesses to reduce the large number of public servants — priorities that remain to this day. It was understandable that they did not want to invest in something that had an uncertain future, regardless of how exciting it appeared to be. This hesitation was mirrored throughout the world; few on the planet wanted to take the risk.

FORTUNATELY FOR NIUE, there was an American technology developer in the United States who was at the same time taking notice of Niue. J. William Semich was a long-time technology and Internet developer who wanted to work with Niue to build its online infrastructure.

Bill and I share a hobby; we are both ham radio operators. We are both guys who would go out in the rain and set up radios just to see if we can get them to work. In Boston, Massachusetts, Bill had formed a non-profit corporation called the Internet Users Society - Niue to develop and market the .nu country code top-level domain (ccTLD) and use some of the profit to build the communications infrastructure on the island of Niue.

Niuean government representatives soon introduced Bill to the Savage Island Network. After organizational discussions, the parties agreed that the project would continue as a private sector development. The Savage Island Network would join forces with Bill and the Internet Users Society - Niue, in order to complete the task of bringing worldwide e-mail and Internet services to Niue.

The primary fund-raising would be the development and international marketing of the .nu country code top-level domain, the ISO-3166 code associated with Niue. Until this plan had been developed, and had been shown to be successful after three years of hard work and investment, nobody was interested in the code.

The resources generated by .nu domain name registrations would be used to develop and maintain the Internet services for the people of Niue. It would, we hoped, bear some of the ongoing costs to make the services cheap enough for Niueans to afford. We really had no certainty if it would generate any revenue at all, in fact.

The ccTLDs were created by Jon Postel and others with the sole purpose of someday being used to help the people in the host countries associated with whatever ccTLD it was, develop local Internet services and provide support for a local internet community. As I see it, to date, a number of them have been used to line somebody's pocket; Niue is one of the few places on Earth that really does use the domain for what it was intended for.

AFTER A LOT OF HARD WORK and a few minor set backs in getting the equipment shipped to Niue, we brought the e-mail only services online. In September 1997, after some weeks of testing, we opened to the Niuean public.

With a growing user base, the e-mail only trial period demonstrated that there was a real need for communications and the development of those communications would be a valuable asset to the country of Niue as a whole. The speed and growth of the network was only limited by the lack of available financial resources. Seeing the potential during the initial test and observation period, the Internet User's Society set up a full-blown global marketing plan for .nu. It also developed its own infrastructure in the United States and Sweden to continue developing the .nu domain. The time people spent online in Niue grew on a steady curve over the first few
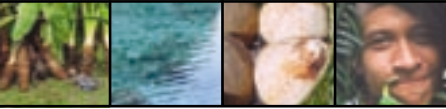
months, and has stayed constant for the last four years. People in Niue used to be online for 10-20 hours per week; now they are online 4,500 hours a week. Each week we send and receive about 20,000 e-mails per week in and out of Niue.

TO ENTICE POSSIBLE REGISTRANTS, we kept names short by allowing registrants to register their domains in the flat .nu namespace as opposed to under second-level domains like com.nu, or .org.nu. We also kept the registration process simple, by allowing registrants to sign up for domain names on our Web site with little required paperwork and by initially charging only US$25 a name, which was cheaper than many ccTLDs, as well as .com, which cost US$100 at the time. It now costs US$60 for a two-year .nu registration. We have chosen to use the Uniform Dispute Resolution Policy to resolve domain name registration complaints.

Sweden is the largest market for .nu domain names. We targeted domain name registrants from Sweden because "nu" means "now" in Swedish; we believe it had a certain appeal to the market for that reason. While "nu" also means "naked" in French, to this day, there are very few .nu domains registered by French nationals.

Richard St. Clair at work.

By January 1999, there were enough financial resources generated by the global registrations of the .nu domains to establish a full-time Frame Relay connection from Niue to New Zealand. Frame relay is the full-time satellite digital connection to the backbone of the Niue and New Zealand connection. It is, literally, the connection; it is also the expensive part that I could not afford when I was trying to make the con-

nection on my own. In addition to varying traffic costs, we pay NZ$10,000 (US$5,673) a month for that 64K connection to New Zealand; within New Zealand, a much faster 256K connection costs only NZ$19.00 (US$10.78) a month.

We also built a dedicated building on Niue for the Internet Service Provider (ISP) equipment to be housed and maintained; to prevent the geckos from getting into the system we built a sealed room next to the satellite downlink location to house the servers. Not only were there enough resources to install the systems and put them online, but also, as it turned out, they were enough to cover the cost of the ongoing maintenance and operational costs. This meant that instead of merely providing cheaper services for residents, the Internet Users Society was able to cover the cost completely, thereby making Internet services free to all Niuean residents. It was an astounding turning point. Because the costs involved in building the connection were so astronomical, we were all pleased that the registrations, alone, could support it.

WE ALSO USED THE FUNDS to build a public access point (an Internet Café) in the Alofi area — where most Niueans live, or work — to provide free access. The public access point was designed and built to target Niueans who may not have computers of their own. As a result, the entire population of Niue has access to the Internet.

Open from 9 am to 3 pm, Monday through Friday, the public access point is constantly used. While the locals are the primary users, many yachtsmen can be found using the services during the Yachting season; at season's peak, there will be as many as 30 anchored yachts in the water. While there is no specific event to come for, many Yachts stop on Niue for

a couple of weeks while out exploring the world. Yachting season is any time of the year when it's not cyclone season, usually from April to September; because there are no lagoons on Niue, there are few places to hide from a cyclone.

While there are not a great number of tourists coming to Niue, flights do arrive from Samoa and New Zealand twice a week. Tourists, and consultants to the island, who are enjoying their stays, or waiting for a flight out also find their way into the offices to check their e-mail.

Because .nu domain name registrations are funding these services, the people of Niue do not have to pay for Internet access. The significance of this should not be underestimated; if access were not free, the cost of equipment maintenance and of connecting to the Internet from such an isolated location would be prohibitive.

CONSIDERING THE CONNECTION COSTS, it is remarkable that the marketing of the ccTLD can pay the cost of developing and maintaining Internet services for an entire nation. Niue's size and population, along with its peoples' willingness to grasp new ideas, and desire to be online, have contributed to the success of the .nu project. Now after several years with full Internet services, Niueans see the Internet as a standard communications utility. Internet use is as common as the telephone, hot and cold running water, and electricity. In fact, there are probably a few Niueans who have e-mail addresses, but do not have hot and cold running water.

The free Internet services have reunited many people who have been isolated from their families who are living overseas. Some ex-patriot Niueans have met members of their "on Niue" families for the first time online, while others have made trips to Niue to finally meet family and see Niue for the first time. This is one example of the Internet truly achieving what many hoped it would — the elimination of the tyranny of distance.

IN THE PUBLIC SECTOR, the Internet has been a valuable tool to enable instantaneous communication with overseas aid organizations. It has substantially helped to coordinate many regional development projects. Going beyond the scope of the raw communications, we have set up an advisory council of Niuean residents who can vote on proposals, which are submitted online, by virtually anyone on Niue. In meetings, the council reviews the proposals and decides how best to serve the Niuean community with whatever resources are available.

Niue has had full Internet services since June 1999. The systems continue to improve. There have been less than eight hours of downtime in four years; those eight hours were the result of the local power company shutting down the power to replace transformers, during which time, with safety concerns, we also had to shut down. As a result, the system rivals any ISP on Earth.

The services have been opened to all permanent Niuean residents and the government of Niue at no cost. Internet traffic has increased and the hardware is state of the art. With continued worldwide support of .nu, the information technology development on Niue can continue as planned.

To this day, this is the only ccTLD model of its kind — a model that generates and contributes enough resources to keep an entire country online with free services. With more than 100,000 domain name registrations, persistent hard work and a little luck we hope .nu will be able to continue to produce the funds to keep Niue online and connected to the world for many years to come.

Niue Nuggets

WHAT: One of the smallest countries in the world, consisting of a 259 sq. km. island known as the "Rock of Polynesia"

WHERE: 2,400 km northeast of New Zealand in a triangle between Tonga, Samoa, and the Cook Islands

CLIMATE: Mean monthly temperatures are between 23 and 27 degrees Celsius with high humidity. From April to December, prevailing winds are the east-south-east trades; from January to March, winds are more variable. Rainfall averages 2,177 mm.

POPULATION: 1,800

GOVERNANCE: Niueans have dual citizenship as citizens of an independent nation in free association with New Zealand. Parliamentary form of government; MPs are elected, the Premier is elected by members of the Assembly

LANGUAGES: Niuean (a Polynesian tongue closely related to Tongan and Samoan) and English.

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