



GREENLAND:
IN A LAND OF ICE AND ROCK,
A SOPHISTICATED NETWORK
ARCHITECTURE EMERGES



CHALLENGE

Greenland is the most ironically named country in the world — “a land that’s seldom green,” as the old folk song goes. Its nearly endless winters are punctuated by intense snowstorms and impossibly cold temperatures. The ground beneath its icy expanse is mostly layers of rock. And whether you want to install sewer lines or fiber-optic cable, the only way to do it is by blasting that ground with explosives.



Greenland is “an amazing country,” NetCraftsmen Business Architect Denise Donohue said. “It’s so different from my home on the East Coast of the U.S. that it’s almost like being on the moon.” Fortunately, this alien landscape is also populated, according to Denise, with “very smart people who are trying to make a real difference for their country. The talent in that nation is just incredible.”

That bedrock intelligence and talent make the people of Greenland eager to embrace the latest in integrated communications and Internet-access technology. And that’s a very good thing, because with only 56,000 citizens scattered across almost 840,000 square miles, reliable voice and data communication are necessities.

Take Greenland’s only high school, for example. It’s located in the capital city, Nuuk. Fortunate students who live nearby, or can arrange to board in Nuuk, are able to pursue their studies there. But it was clear to the nation’s leaders that erecting a fast, reliable web network as well as robust voice and data communications would deliver unprecedented access to online learning for every student in Greenland. That’s the kind of practical application of technology that NetCraftsmen client TELE-POST — the nation’s primary telecommunications provider — has been eager to meet.

So, when TELE-POST leaders embarked on an initiative to upgrade the nation’s telecommunications capability to deliver next-generation, European-quality digital video, broadband Internet, and GSM mobile service to everyone in Greenland, they knew it would be no easy task. TELE-POST is wholly owned by Greenland’s government, which itself is part of the Kingdom of Denmark. So, in addition to geographic and climatic challenges, implementing a solution would require a good measure of international diplomacy and cultural literacy.

Another obstacle: TELE-POST’s existing infrastructure. Like many service providers, it consists of an amalgamation of old and new technologies. Some remote areas are served only by copper cables and landline phones, or not at all. This was the catalyst for an important way of thinking throughout the engagement for TELE-POST: Should the company upgrade old equipment on an existing infrastructure element, or should it come up with a new approach entirely — a different transport mechanism — for any existing or new services?

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STRATEGY

TELE-POST made clear that in designing this next-generation architecture its vision was to improve services for the entire nation.

As every citizen of Greenland can benefit from TELE-POST services, the company insisted that its partners focus on the following:

- 1. Enhancement of the power and performance of services for everyone** instead of focusing on expanding available services at particular locations in the country. Households in smaller villages might not be able to have the same bandwidth as those in larger towns, but as many citizens as possible should have improved bandwidth and access to improved services. The goal was to at least meet European standards in this regard.
- 2. Continuation of strong profit performance nationwide, maintaining revenue streams thanks to outstanding performance and service.** While technically a national entity, TELE-POST is not a monopoly; telecom and Internet competition exist in Greenland, and a rival provider taking market share means erosion of the revenue stream. Offering innovative services would mean reaching and securing new markets.
- 3. Constant awareness of existing and emerging challenges, including social, geographic, and climatic barriers.** Community and tradition are major forces among Greenland natives. Any vendor introducing new or improved technologies would have to demonstrate not only technological skill, but social savvy, especially as an outside organization.

In other words, NetCraftsmen would have to be adept at both building a better network, and in helping leadership and citizens alike understand why some of the recommended approaches might break from tradition.

Achieving TELE-POST's business objectives, despite Greenland's geography and its widely dispersed population, meant recommending changes to established procedures

and tried-and-true approaches. NetCraftsmen's focus on business outcomes helped demonstrate the need to adopt more cutting edge technology solutions in order to accomplish TELE-POST's goals.

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Of course, in addition to all these pragmatic operational priorities, TELE-POST also expressed the fundamental desire to simply give the citizens of Greenland the best possible service experience. That could be interpreted as anything from better Internet access itself to all the educational, health, and cultural advantages these innovations would deliver.

"TELE-POST did a ton of preliminary work as the transformation plan took shape," explained Denise. "They gathered all the stakeholders, along with the expert team from NetCraftsmen, Cisco, and Ericsson, and came to the table with results from internal discussions around ideas and visions for the next-generation network. The overarching imperative was that they didn't want us to design something based on today's technology. They wanted a solution forward-engineered to work with tomorrow's innovations. That visionary expectation set the tone for the entire engagement. Sticking to it meant they could rest assured that their solution would perform as well down the road as it would from day one."

SOLUTION

Along with those other high-profile vendors, NetCraftsmen would lead the team to develop an approach called Transformational Architecture. It's a practical implementation and forward-thinking approach that would include, when appropriate, the deployment of leading technology for today while also anticipating emerging trends in telecommunications services and networking technologies. For TELE-POST, that meant incorporating programmable networks, virtualization, and similar advances that would ultimately allow for easy management of more services on a simplified network infrastructure.

Transformational Architecture is built on three complementary elements:

- 1. Virtualization of services onto a common platform and means of management.**
- 2. Creation of a unified network layer that will accommodate all traffic.**
- 3. A greatly improved transmission network that is more robust and offers much greater capacity.**

Facilitating this transformation required a remarkable level of finesse. Respecting Greenland's great combination of challenges while working with a government-owned company eager to keep the best interests of every citizen top of mind, NetCraftsmen had to help develop and diplomatically present a multifaceted solution. Unlike smaller implementations that might be resolved with a single strategy, or larger efforts that could be met with a collection of "off-the-shelf" solutions tied together, Greenland proved to be truly unique.

"NetCraftsmen provided valuable design guidance for our Network Transformation Plan," said Andrew Aparico, TELE-POST Greenland's CTO/CIO. He described that transformation as part of the strategy "to evolve the infrastructure and networks that provide WAN, fixed and mobile telephony, Internet access, radio chain, marine sea cable, and satellite coverage services. They are helping TELE-POST transform into a next-generation provider."

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Standing up the new network requires a combination of sea cable, microwave, satellite, mobile broadband, and DSL. There was even fine-tuning as to the type of line used point-to-point, with fiber within the major cities, and copper and mobile broadband being sufficient in the smaller villages and settlements. Again, NetCraftsmen diplomacy was critical in explaining why the system would be so diverse, and why every citizen would not necessarily have access to precisely the same service levels. While this would not be seen as a major challenge in many countries, the progressive political culture of Greenland meant leadership needed to understand why rural citizens might require a different solution than city dwellers.

"Given the vision expressed by TELE-POST leadership, the needs of Greenland citizens, and the many constraints of landscape and weather, we really put in some late nights working on how to provide the right technology," Denise said. "We wanted to stand up the services they wanted, and — in simple terms — just figure out how to get that signal out. The constraints were incredible and the challenge was awesome. It proved to be a quintessential example of out-of-the-box thinking."

RESULTS

As might be expected, an undertaking of this size is a multi-year project.

As Greenland's Transformational Architecture is rolled out, it brings with it many benefits. These include:

- 1. Increased Network Capacity.** This means more service offerings, social improvements, and a more reliable network. In a country with highly distributed small villages and settlements, the ability to offer efficient online learning is a profound improvement.
- 2. Distributed Services.** A granular means of optimization ideal for remote customers, end-to-end transport and virtualization will allow citizens to access the same services as those in more populated areas.
- 3. Mobility.** Expanding the reach of 3G and 4G services improves mobile Internet access and data use. Additionally, to empower citizens in less-populous areas (typically fewer than 1,000 residents), a move from all-copper home connections to mobile broadband makes sense. It is more cost-effective than copper, easier to maintain, and would unify all network access.
- 4. Network Virtualization.** In addition to obvious benefits like eliminating hardware, network virtualization technologies will facilitate orchestration and distribution of services and enable unified management and provisioning.

Greenland's new network architecture will allow TELE-POST to seek out a host of new service offerings, making them more competitive and increasing revenue potential. From the convenience of file-sharing via services such as Dropbox to accessing the entertainment options of Netflix, Greenland's citizens will be brought forward to today's leading edge of information technology user experience.

Similarly, the country's research and academic organizations, media and content providers, and the community at large will now have more complete access to the interconnected power of fast, robust online access. That fuels interaction, innovation, and the incubation of ideas.

Over the next few years, the architecture will continue to be improved and refined. TELE-POST leaders made it clear from the start that they were not looking for a solution that would make a one-time improvement to antiquated methods of connectivity and communication. They wanted, and are getting, a telecommunications and network solution that can and will evolve in step with today's technology as well as tomorrow's innovations — and one that always accounts for the distinct challenges that only a nation of ice, rock, and socially conscious, tech-savvy citizens can present.

"In truth," Denise concluded, "I almost had a bit of guilt for my part in bringing this technological transformation to Greenland because of its ability to change the quiet and tradition of those remote village cultures. Providing high-quality Internet access will bring a lot of benefits, but also social interaction changes and challenges. Once this is built out, people can watch Netflix on their iPads, play Candy Crush — and kids can do their homework, of course — during those long winters."

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About NetCraftsmen

Founded in 2001, NetCraftsmen is a consulting company whose engineers are true Master Craftsmen, world renowned for their expertise and experience. NetCraftsmen clients Rest Assured knowing that a team of industry leaders, visionaries, and innovators are dedicated to ensuring that their IT network is built and managed to meet and adapt to today's enterprise demands.

About TELE-POST

Behind TELE-POST is the TELE Greenland A/S group, wholly owned by the Government of Greenland.

TELE Greenland A/S covers a population of 56,000 scattered over thousands of kilometres, providing telecommunications, IT and postal services.

Even the smallest village has radio, TV and a telephone link to the outside world, and all settlements with a population of more than 70 have broadband Internet and GSM mobile phone service.

TELE Greenland A/S employs approximately 460 staff. The head office is in Nuuk, and we have divisions in every town in Greenland.

