



## CASE STUDY Industrial Wireless LAN

### NCC Sweden Constructs A Wireless Solution to Cut Costs

NCC is one of the leading construction and property development companies in the Nordic region. Within the NCC group, NCC Construction Sweden is responsible for numerous projects spread across the length and breadth of one of Europe's largest countries: The IT department supports the infrastructure providing data services to approximately 700 offices – many of them very remote - from the headquarters in Solna, near Stockholm.

As an organisation, NCC strives to combine the presence of a local company with the strengths of a large group. Needing to be near its customers, the majority of major cities have an NCC office, and every construction site has some form of small office to meet the needs of the project's consulting engineers, architects, and administrative staff.

#### The Networking Challenge

The offices of NCC Sweden vary in size from 10 users to 800. Of the 700 offices in Sweden, 500 are temporary Portakabins™ intended to support the construction teams and partner organisations while on site. With such a large number of temporary remote offices, NCC Sweden's IT department faced unparalleled difficulties;

- how to deploy and manage so many temporary offices,
- how to secure so many remote sites, and
- how to meet corporate objectives for a cost-efficient operation, sustainability and reduced environmental impact.

In 2004, NCC Sweden's IT team, led by IT Manager – IT Infrastructure Lars-Erik Åhlin and Datacoms Manager Anders Eklind, started to look for new ways to support a network of constantly changing remote offices. Much of the existing network was delivered as managed service, but Åhlin and Eklind wanted to find a way to cut costs while meeting the operational needs of NCC - an organisation where both employees and offices were mobile.

A major challenge for NCC was the setup, commissioning, support and eventual removal of the temporary network at each project site - typically resulting in 3-5 small office moves a week. Network provisioning at each office was complicated by the lack of local support, and constant changes to the number of users in each office.

Eklind realised that:

*Traditional wired networks did not meet the mobility needs of the employees, the flexibility needs of the organisation, or the reliability goals of the IT department*

*A wireless network would meet the mobility needs of the employees, and it could be provisioned and managed centrally.*

Consequently, Eklind undertook a review of the market and chose to deploy an Aruba wireless solution; access points licensed for campus use in larger offices, and the same access point hardware licensed as Remote Access Points for remote offices.

It was clear that a wireless network would be able to accommodate the moves-adds-changes required on the construction site much easier than a wired network, and given the nature of a construction site, it would also provide a more robust solution. The Remote Access Point was simple to deploy, did not require on-site support and had the advantage of offering the both staff and NCC what they wanted; the flexibility of a wireless network.

The wireless Remote Access Point also directly addressed one of the concerns of the IT department at NCC Sweden; the use of consumer wireless access points onsite. Such unapproved 'rogue' access points were occasionally attached to the wired network by employees seeking to benefit from wireless mobility but without understanding that an unsecured wireless network would compromise the security of the wired network.



#### Requirements:

- Simple deployment and operation of numerous temporary office networks
- Reduce operational costs and improve security
- Centralised management rather than distributed complexity

#### Solution:

- 3x Aruba 6000 mobility controllers equipped with SC and M3 modules
- 300 x AP61 Access Points
- PEF License
- WIDS license
- RAP License

#### Benefits:

- 90% reduction in network infrastructure costs at temporary offices
- 50% reduction in network infrastructure costs at new major offices
- Simple to deploy network at remote site that does not need a site visit to set-up
- Only 5 hours a week to support 200+ offices
- Highly reliable
- Single point of management

## Solution

At NCC Sweden today, some 200 construction site offices have been equipped with wireless LANs using the Remote Access Point. About half of the smaller fixed-site offices (10-20 people employees) also have wireless, and all of the larger 16 offices have pervasive wireless coverage.

The results of the deployment have been spectacular:

- The cost of deploying a larger office has fallen by 50%, as a result of 'network rightsizing' reducing the size of the traditional wired network.
- The cost of the smaller office deployments have fallen by 90% as a result of provisioning the network using wireless Remote Access Points.
- Support needs have been reduced to no more than 5 hours a week for the 200+ sites using the WLAN, primarily because of the ease of deployment, operation, and support.
- Employees have embraced wireless mobility.
- Remote Security has been improved.

## The importance of choosing a flexible solution.

NCC Sweden initially only equipped meeting rooms in its medium and larger offices with wireless. However, user demand and very clear cost savings combined with a natural organic growth in the number of wireless clients has led to Wi-Fi becoming a pervasive technology used throughout their offices.

Although the wired network hasn't been removed, working wirelessly has become part of every-day life at NCC Sweden, explains Eklind "About 75% of our users have laptops and you can see how the WLAN has changed the way people work. They no longer expect a docking station and separate screen – the majority of people really see the benefits of mobility and they value that over a traditional fixed desk position. Many simply connect wirelessly all the time."

Consequently, NCC Sweden has found that the way they use the network has evolved, and the choice of a solution that could adapt to their needs was particularly beneficial: "We did not set out to deliver a wireless network with 100% coverage at our offices," explained Eklind. "However the Adaptive Radio Management built into the Aruba operating system means that the wireless network automatically takes account of local conditions, and provides

excellent coverage, even without a dense deployment of access points."

## Network 'rightsizing' cuts costs by 50% for new offices

In addition to allowing employees to connect to the network in a way that best fits their needs, NCC has seen significant cost savings from a 'network rightsizing' strategy.

On commissioning a new large office in Malmo, NCC originally planned to run an average of 2.5 -3 cables / ports per user – some 500 connections in all for a user community of 200 office workers. However the success of the wireless network in other locations led NCC to 'rightsize' the wired network. Rather than put multiple cabled ports to each desk (typically one for the PC, one for the phone, one for a visitor), NCC ran only one cable per desk, and put very few wired connections into the common areas – resulting in an average of only 1.5 ports per user. By running less cable, and buying fewer LAN switch ports, NCC Sweden saw a saving of \$30,000 in networking and cabling costs in this one office – a saving of 50% compared to a traditional all wired office. Malmo is now NCC's first 'rightsized' large office – but it won't be the last.

In addition to the cost saving, an office equipped with wireless is also a great deal more flexible and accommodating, particularly when refurbishment takes place, as Eklind explains; "Moves adds and changes on a network cost money. Sometimes when you move into a new office, or refurbish an office, priorities change and people have to move in early. A wireless network allows us to be very flexible, and if people have to sit at a different desk for a week or two, moving them to their final location costs us nothing, and has virtually no impact on the support department. This is quite different to wired networks where moves, adds and changes are a significant and ongoing cost."

## WLANs Also Deliver Dramatic Savings at Smaller Offices

With so many remote offices, and particularly offices that were temporary, even a small saving in capital and operational expenditure on each site would compound to a significant annual saving for NCC. Costs to deploy a small temporary / remote office – typical of a construction site - are between \$2500 and \$5000 depending on the size of the office.

The picture is quite different in the 200 offices where NCC has so far deployed the Aruba Remote Access Point. In those offices costs for capital network expenditure have been cut by 90% - to

\$250, including postage.

The dramatic reduction in networking costs is matched by the reduction in the support required from NCC Sweden's IT team. Eklind particularly noted the operational benefits of moving to wireless "The wireless network needs less support than the wired it replaces. With the wireless network we get only 2-3 calls a week for the entire network, and those calls tend to be user error or simple to resolve issues like forgetting to open the antenna on a self installed access point."

#### **Simple to deploy, lower Total Cost of Ownership, and more sustainable.**

By choosing a solution that was simple to deploy and easy to support, NCC was able to use its existing team to run the remote network as Eklind describes; "With 200 temporary sites, you can imagine we are continuously deploying new offices or disconnecting old ones. Deployment of a new site is as simple as putting the network in the post. When we want to deploy a new office, we scan the barcode on the access point, print out an instruction sheet that goes in the bag, and literally put the access point in the post. That's the best way to deploy a remote office!"

The use of wireless also helps NCC meet goals on environmental sustainability. Wired networks installed in temporary offices are invariably difficult to re-use. Cables cut to a specific length to meet the needs of one office are unlikely to be useable at another, and consequently are disposed of at the end of a building program. However, wireless access points, are simply posted back to the IT team to be reused at the next construction site. This not only saves NCC money but assists in their goal of improving environmental sustainability and reduces the amount of cabling wasted.

#### **Reliability**

An organisation that has to support temporary offices faces challenges different to static offices. Cables laid around construction sites invariably get broken, the mobile nature of the workers

means that cables are moved within the offices but then found not to be long enough, or the termination becomes damaged. Since moving to wireless, not only have support calls associated with network reliability fallen dramatically, but Eklind's team spend no more than 5 hours a week deploying and managing the entire wireless network. Best of all, the network has been extended to the areas outside the offices using external antennas, allowing consultants and architects to connect back to servers or printers while within the facility under construction.

"We've some 300 access points deployed at any time, and they are enormously reliable" noted Eklind.

#### **The Benefit of Experience**

Running a large distributed network has provided the IT team at NCC Sweden with some useful experience in the operation of wireless networks. They note that not all wireless solutions are created equal, and some are better suited to remote deployments than others. Perhaps even more importantly, the NCC Sweden team recognise that just because a wireless LAN is bought for one purpose doesn't mean it won't have to adapt to other uses. Indeed, given the acceptance of wireless by the user community, it's very likely that any wireless LAN will ultimately be used in ways that no-one expected. For NCC Sweden, a solution bought primarily to reduce the costs of remote office deployments has led to a completely new approach to building new offices, allowing them to move away from the traditional flood wiring of the 1990's to a much lower cost, and ultimately much more useful, mobility network based on wireless.

Eklind summarised his experience of running such a wireless network; "It's easy to run, it's how our users want to connect, and it allows us to keep our costs under control today, and in the future."



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#### **Organisation Overview:**

NCC is one of the leading construction and property development companies in the Nordic region. The Group had sales of SEK58 Billion (approximately \$7 Billion) in 2007 with approximately 21,000 employees. Swedish construction operations are combined under NCC Construction Sweden which builds everything from schools, hospitals, sports facilities, and housing to roads, bridges, railways and power plants.

***"We've 200 temporary sites, and another 50 fixed sites around Sweden using the Aruba Remote Access Points. We spend only 5 hours a week supporting it, and this includes provisioning remote sites and general management. Best of all, the solution is enormously reliable."***

**Anders Eklind**  
Datacoms Manager  
NCC Sweden



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