The Swedish National Police: How to avoid locking yourself in while saving money

In 2006 the Swedish National Police launched a project that led to the implementation and migration from an ICT infrastructure based on proprietary products to an ICT server and database platform based on Open Source software and open standards. The previous ICT platform was very costly and obliged the Police to stick with a hand full of vendors. The aim was therefore to cut costs, avoid vendor lock-in, achieve better performance, and introduce open standards.

Before ideas were realized, a thorough study was conducted to calculate costs and benefits. This study foresaw cost savings of up to fifty percent over a five years period compared to the proprietary hardware and software in place at this time, while improving performance at the same time.

Due to the dimensions of this project that affected the entire ICT infrastructure of the Swedish National Police, it was not always easy to turn ideas into reality.

Quick facts	
Name	Swedish National Police
Sector	eGovernment
Start date	06-02-01
End date	ongoing
Objectives	Introduction of a back-office Open Source ICT architecture for the National Police
Target group	ICT administration
Scope	National
Budget	N.A.
Funding	National
Achievements	Development of a detailed business case study, and first implementation of Open Source ICT infrastructure

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Introduction

In Sweden, the Swedish National Police Board (SNPB) maintains the IT infrastructure for the Swedish National Police. It is in this board that all decisions are centrally made regarding administrative issues concerning police authorities throughout the country.

Around the year 2000, the former director of Development and Strategies and his team at the National Police Board, investigated new possibilities for a more economic and flexible IT infrastructure. Per-Ola Sjöswärd, who is today executive IT-Strategist at the CIO's office, went to several conferences and eventually realized that "we must have an IT architecture which is not locked to a special vendor." As the old architecture was comprised solely of proprietary solutions, the Swedish Police was dependent on specific vendors for the support, which in turn added high support costs to the already substantial licensing costs.

© Swedish National Police, 2009.

In the following years the Police weighed their options searching for solutions that minimized costs, introduced open standards, increased the freedom of choice of technology, enhanced the competition between vendors, and minimized the dependency on one vendor. Eventually the team in charge of this process established a business case study in early 2006, which concluded that only Open Source Software (OSS) would meet their demands. After the the National Police Commissioner decided for the deployment of OSS in November 2007, the CIO's office started the process of implementing the new ICT architecture. In the two years since the start of the project the CIO's office is still positive about the success of the project, however they also have come to realize that it takes a lot of work to make a business plan become reality.

Organisation and background

The Swedish National Police Board is the central organisation in the Swedish national police system. It stands above the 21 police authorities and the national laboratory of forensic science. As such, it is in charge of managing the national police budget, and comprises all important offices for the organisation of the national police services. For example, decisions on the number of helicopter or police cars purchases are made in this body, just as decision with regard to the ICT architecture. The Swedish National Police consists of roughly 27.000 employees, 19.000 of which are police officers.

The chief information officer (CIO) Ola Öhlund is in charge of making all relevant decisions

concerning the National Police ICT infrastructure backbone. The CIO's office is directly connected to the SNPB and consists of seven staff members, who have a strong technical background and ensure the Police has a reliable and efficient ICT system. The office is still relatively new, as it had only gained the status as a more or less autonomous office within the SNPB about three years ago. Roughly 600 employees work in the Police ICT department, which is part of the business development organisation carrying out the decisions that are made by the CIO.

Budget and Funding

The annual IT-budget for the Swedish National Police is €130 million, which is administered by the CIO office. Clearly not all of this budget is dedicated to the implementation of the new ICT architecture, but also comprises various software licenses as well as hardware purchases that the Police has to do over the year.
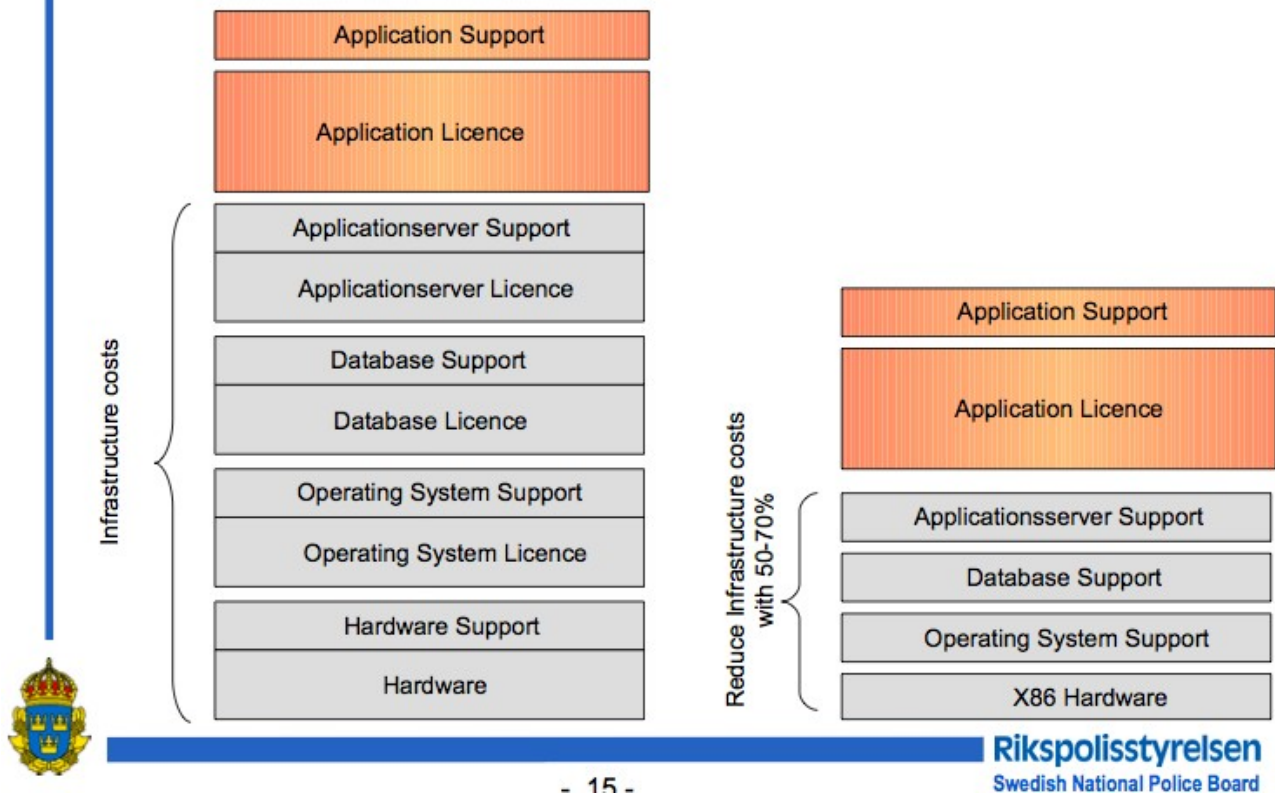
"Between 2001 and 2006 we used proprietary products, because an open source environment was not so common in the beginning. So we tried proprietary products, but we realized in 2006 that it was too expensive to go on with that", remembers Sjöswärd. From the servers to the databases, the CIO office calculated that the costs of continuing to employ the proprietary solution would amount to €40 million for licenses, server hardware and support over the years from 2006 to 2011. At the same time, the team also made calculations for the costs of Open Source Software and X86 server hardware. They concluded that due to the competition between support partners for Open Source products, the prices were considerably lower than comparable support for proprietary solutions. Additionally, there were also large savings resulting from using open licenses and moving to X86 server hardware instead of proprietary hardware. Eventually the team estimated the cost for employing the new ICT platform for the same period to be only €21 million, which was nearly 50% cheaper than the proprietary counterpart. To illustrate the impact of this amount, Sjöswärd says it is equivalent to 400 new police cars, or the salary of 70 new system developers for a five year period.

The Total Cost of Ownership (TCO) of using Open Source vendors instead of proprietary vendors has thus been reduced substantially. In a presentation about the Swedish National Police (*See Links section*) Sjöswärd highlights that the cost for the application server amount to only one fifth (1/5) of the previous solutions, and the cost for the database only one seventh (1/7) of the price of the proprietary solution.

Sjöswärd emphasises that the use of standard X86 server hardware was another factor for cost reduction. "If you switch to Open Source Software, you must also switch to simple, standard X86 server hardware, because the competition there is much stronger and you have the possibility to negotiate with hardware vendors." Compared to non-standardised hardware products sold only by

selected companies, using standard hardware makes it possible to select the best offer for hardware and support.

Open Source in the new IT-ecosystem

Application Support	
Application Licence	
Applicationserver Support	Application Support
Applicationserver Licence	Application Licence
Database Support	
Database Licence	
Operating System Support	Applicationsserver Support
Operating System Licence	Database Support
Hardware Support	Operating System Support
Hardware	X86 Hardware

Infrastructure costs

Reduce Infrastructure costs with 50-70%

Rikspolisstyrelsen
Swedish National Police Board

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Cost comparison between the previous proprietary ICT solution and the new Open Source solution ©Sjöswärd, 2009.

Technical issues

The SNPB's move towards an open ICT server infrastructure went along with a change of suppliers representing a much larger number of potential suppliers for the adapted Open Source solutions than has been the case for the replaced commercial products. Such a diverse range of potential suppliers has been one of the key aspects for the SNPB to avoid a vendor lock-in and to allow for competition.

It is important to highlight that the software and hardware migration only took place on the servers in the data centres, and not at the client computers. For the local police officers distributed across the country everything remained the same, and nothing new had to be learned. Even more so, the

desktop PCs at the Swedish Police are still running on a proprietary operating system. Essentially the implementation of Open Source Software can therefore be considered a background migration of which only performance enhancements are felt on the desktop computer.

The migration project has been focusing on the replacement of four essential parts of the infrastructure: 1) the application server, 2) the database, 3) the operating system of the servers, and 4) the CPUs thereof.

The application servers in the previous architecture were BEA WebLogic Server 8.1. Although the application server did everything the Police needed at the time, they could already see that it had some performance limits. More importantly, it was very costly, which was not sustainable in the long run, especially in the light of more economic solutions that would offer at the same time more capacities. The CIO office therefore decided to employ the JBoss EAP application server. The solution only costs a fifth of the price of BEA, and was much improved in terms of performance. The same holds for the database and the operating system running on the servers. The database MySQL replaced the previously deployed Oracle, and Linux SLES by Novell replaced the operating system HP Unix on the servers. This combination, together with the new standard X86-based ICT hardware which the Police installed, gave a clear boost in performance and stability.

To prove this, the CIO's office has conducted a benchmark test with their in-house developed PICTURE software. This software is used by police officers to search and store passport pictures and other photo material. Although there are on average about 3,500 daily passport picture queries, this number can occasionally peak substantially higher. Whereas BEA only could cope with a maximum of 100.000 queries before the system slowed down considerably or would no longer work at all, the new architecture can cope with a number ten times higher, namely: 1.000.000 queries. The reason for this is that the new server and database environment takes up much less system resources than the previous system, which at the end boosts performance dramatically. The improved performance is therefore mostly due to the lightweight software, and not necessarily linked to a new hardware environment. Sjöswärd sums up "So if you switch to an Open Source system it may not just be for the cost aspects, it can be for performance also."

Ola Öhlund, Chief Information Officer at the Swedish National Police Board © Swedish National Police, 2009.

Another advantage of working with an Open Source environment is the fact that it is much easier to find developers and support for the solutions, because one can choose between many vendors and the number of people developing in Open Source environments is constantly rising. Considering that about 70% of the Swedish National Police's ICT system is developed in-house, the importance of this quickly becomes evident. "If you speak with any developer and ask if he wants to use BEA, Oracle, *or* if he wants to use JBoss, the

answer is always JBoss", explains Sjöswärd. Finding competent developers and system administrators and building in-house expertise in this regard is very important, as proprietary vendors can only support their own solution. So if there is a problem with an in-house developed application it may take weeks to get support, or it may not be possible at all, unless there is someone employed at the Police who can take care of the problem. With the implementation of the Open Source environment the CIO also invested €126.000 in staff education for JBoss, MySQL, and Linux SLES to make sure that the competence is always available in house. Here again, the CIO's office saw the spending in relation to the savings generated from the implementation: "It's not a lot of money if you think of what you can save", as Sjöswärd compares the building of own competence together with professional open source support if you compare it with traditional commercial support on proprietary solutions.

Change management

Before the integration of the new software and hardware into the ICT environment of the Swedish Police, several steps were necessary to make sure that the whole process was implemented carefully.

Initially, a team of staff members from the ICT department realized that the ICT environment at the Police would have to change. They were "fed up with the high costs and the vendor lock-in" states Öhlund. Responding to these impulses, a team of IT specialists surrounding Sjöswärd started the investigation of a business case study about the migration towards an Open Source ICT architecture. This study was finished in October 2006, and became an important document, as it was the first step in the project. On the one hand it made people realize the benefits of using an Open Source Software environment and standard hardware, and it also thoroughly researched what solution would have to be employed. Following this preliminary study, the National Police Commissioner formally made the decision to implement the new ICT infrastructure in November 2006.

Per-Ola Sjöswärd, Executive IT-strategist at the Swedish National Police Board © Sjöswärd, 2009.

The project was divided in two steps: the implementation project, and the migration project. This division gave the project more structure, as the both sub-projects are rather substantial projects on their own.

The implementation project started in March 2007. New X86 standard hardware was bought, together with support and maintenance for the data servers. "We bought around 300 CPUs, and maintenance for the database MySQL [for around 120 CPUs]. We also bought support for the Linux operating system for about 300 CPUs, as well as support for around 130 JBoss application servers" recalls Sjöswärd. This aspect of the project however was still relatively easy, considering that

nothing from the old infrastructure was touched at this point. The difficult part at this stage was to find the right solutions and to install them so they would function properly. As the team had already acquired a certain level of expertise and most decisions were well planned, the process of implementing new software and hardware solutions was relatively uncomplicated.

After finished the implementation project in December 2007, the migration project started in April 2009 and was just as large, if not even larger as the implementation project. As part of this sub-project, 33 legacy systems will eventually be migrated to the new ICT platform, which is planned to be completed in two years until 2011. The big challenge in this project is ensuring that the existing ICT infrastructure works properly with the new ICT environment. According to Öhlund this process of migrating existing applications to the new infrastructure is not always easy. In contrast to the business case, the CIO is a sees this timeline with less optimism and states a slightly different aim for the completion of the whole project: "somewhere in 2015 we will have realized all the benefits." For Öhlund it was important to have a good business case study before the project started, as this laid a good foundation and convinced other people at the Swedish National Police Board of the advantages of such an ICT infrastructure. In practical terms however, he sees that realizing the plan is a different challenge, to which the CIO office is dedicating many resources at the moment. On the one hand there is resistance due to the high costs of such an undertaking. Especially when there is a delay in the implementation and migration of software and hardware solutions, this can become a barrier to the project. And on the other hand, one needs to convince people that such an undertaking is in fact a necessary step, and that the old infrastructure should be replaced. There are thus several aspects that can impose barriers to the success of a project. To put it in Öhlund's words : "The change itself is the main obstacle."

In order to cope with these obstacles, the CIO office had to work on two fronts: on the one hand it was necessary to talk to people and convince them of the advantages of the new ICT infrastructure, and on the other hand they had to find the right solutions, build up expertise, and implement and migrate the solutions. It this regard it certainly helped that the team did not rush into the project, but planned every step carefully. Only by introducing and migrating new software and hardware step by step, the team could avoid problems on a larger scale, which would have sparked new criticism. The fact that old software and hardware can run simultaneously with the new solutions without much difficulties clearly is of help as well. For Öhlund to be successful with such an initiative it is important to integrate it as part of a larger organisational strategy. "It is not a standalone issue that you try to push forward, rather […] it is a part of an IT strategy and a business strategy", he explains. By disseminating the project in this way, the acceptance at all levels is much higher, and people are much less reluctant to accept initial costs and migration processes.

From a financial point of view, although a delay in project completion does invoke additional costs, the team is still confident of its benefits. As there is no dedicated budget to the project, but it is covered under the general CIO budget, the process will not be stopped once the financial resources are exhausted. The CIO office is still convinced of the financial benefits that the undertaking will

bring eventually. Although a large share of the ICT budget of the Swedish Police currently flows into the project, the team is aware that in the future this flow of money would have been greater had they continued to use a proprietary platform.

Cooperation with other public bodies

Although the Swedish government is trying to promote the use of Open Source Software in the public sector, there are not too many examples where Open Source is used on a similar scale as by the Swedish National Police. According to Öhlund and Sjöswärd, there are many public bodies that use Open Source applications in their daily operations on a small scale, but the introduction of an Open Source server and database environment on the scale of the Swedish National Police is unique in Sweden. As a result of this, the team did not have many partners to consult. The team had some conversations with Premiepensionsmyndighetens (PPM) which manages the national premium pension system, and which also migrated its ICT to an Open Source environment. There was however no direct cooperation.

In addition to that, there were two important reasons why the Police did not ask for help from other organisations: One the one hand it was essential for the Police to develop own expertise, in order to understand the system thoroughly. The fact that only few organisations had done a similar undertakings was seen as an opportunity to develop the knowledge and expertise in house, which is of fundamental help for the maintenance of the system. On the other hand it was important for the Police to have a Swedish language environment as well as support for their ICT infrastructure. This excluded many projects outside of Sweden as possible partners for coordination.

Evaluation

Achievements / Lessons learned

For the Swedish National Police, the introduction of Open Source software and standard X86-based server hardware to their ICT infrastructure, has many advantages. The most important aspects in this respect are: cost savings, limitation of the vendor lock-in, and the use of open standards. Considering that the Police is planning on saving roughly €20 million over a period of five years, the financial incentive to turn to Open Source Software and standard X86-based server hardware was high, especially considering the fact the solution is not inferior to the proprietary solution that was previously used.

For the project team, it was very important to prepare a good roadmap ahead of the migration project. This helped in setting clear targets with regard to timelines and technical solutions. As this

is often the case in other project involving a large-scale migration, convincing the people in charge of an organisation is never easy. In order to manage this "soft migration" successfully, as Öhlund calls it, communication of the advantages of a new system and disadvantages of the old system is very important. The business case study in this respect was also of great help in convincing the Swedish National Police Board that this migration step was a viable alternative.

While having a clear strategy is of great help to such a project, Öhlund also states that it is not always easy to make theory reality. Moving from a proprietary software environment to a consolidated Open Source Software environment with standard X86-based server hardware is a very big undertaking that should not be underestimated. "That's the tough part, actually getting things done. And I think we might have some good insights to share with others", Öhlund furthers says. After all, there are not many other organisations that undertook such a large scale project for the sake of avoiding the vendor lock-in and reducing costs.

For Sjöswärd it is furthermore important to not only focus on software, but to include hardware in a such an undertaking in order to fully benefit from it: "[...] If you switch out the infrastructure from proprietary hardware and proprietary software to common hardware based on X86 products and Open Source Software, you will decrease [the costs] between 50% and 70% over the course of three years". And he further highlights that this is not only true for the public sector, but for the private sector just as much: "Open Source can be a door opener for private companies as well. This is another twist to the story."

Future plans

The team at the national Police is hoping to complete the migration project for 33 legacy systems to the new Open Source ICT platform in a timely manner. As the business case laid out a rather optimistic target, the team is trying its best to complete the migration by 2011, as Öhlund explains.

Although the team is not actively engaged in a desktop migration at this point, the team is thinking about models how to employ free software in the desktop environment of the Swedish National Police. There are however no concrete plans yet.

Conclusion

The case of the Swedish National Police is a good example of how a public institution can avoid the dependence on particular hardware and software vendors, and how this has the potential to increase performance.

As public bodies throughout Europe are seeking to reduce costs and to maximize the value of their ICT infrastructure, the number of institutions that has realized the potential of Open Source Software is still relatively small. In this sense, the Swedish National Police can still be considered a pioneer. It was for this reason all the more important that the implementation process was well planned and carefully executed, in order to avoid drawbacks that only undermine the resistance to

change. Although the process of implementing a new ICT infrastructure takes time and money, the Police managed to calculate the costs as well as the benefits accordingly. The project plan in this respect might have been slightly optimistic in this regard, but the project team is still convinced of the benefits the migration will bring eventually. Considering savings of up to fifty percent within the coming years, the Police has managed to plan a system that not only is cheaper, but also has managed to boost performance and stability.

For other public bodies that find themselves in a similar situation, these are important arguments that should calm down critics and encourage the step towards change.

Links

National Swedish Police Board

OSOR.eu new item - Police to use Open Source database system

MySQL news item - The Swedish National Police Move to and Open Source Infrastructure with MySQL Enterprise Unlimited

MySQL - Interview with Per-Ola Sjöswärd, Executive IT-strategist, Swedish National Police

Computer Sweden - National Police to open source (Google translate)

Presentation by Per-Ola Sjöswärd– Open Source at Swedish National Police Board

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