Case Study:
Federation of the Danish Public Sector

The world is watching Denmark. That’s because the Danish government is aggressively and creatively deploying a SAML-based solution designed to dramatically improve the delivery of government services.

The solution has been in the works since 2005 and was formally rolled out in early 2008. Early reports indicate citizens, service providers, and others are extremely satisfied. In fact, an e-government working group at the United Nations recently recognized Denmark as having the best portal in the world for public service.

Denmark and Its Outspoken SAML Support

Denmark’s e-government work is all the more noteworthy because of their outspoken support for SAML. Denmark, in fact, went on the record in 2006 urging Microsoft to support “customer choice by implementing support for SAML 2.0 in their operating system.” To not support open standards like SAML, they said, would “stifle innovation.”

This statement from Denmark sent a powerful message to the worldwide identity community.

“Theyir comments catalyzed a lot of important conversation about standards and interoperability,” said Colin Wallis, the head of Liberty’s e-government SIG and the authentication standards program manager for the New Zealand government. “Today, Microsoft’s support of SAML 2.0 tokens is a step in the right direction. But I think the whole community is looking forward to the day when Microsoft publicly announces support for SAML 2.0 protocols and profiles.”

Background: A Progressive and Digitally Aware Nation

Denmark today has 5.5 million inhabitants and is one of the richest and most egalitarian countries in the world. The public sector makes up 1/3 of the total workforce. That’s a lot of people working in government.

The Danish public has been digitized to a wide degree. For example, citizens have been digitally registering since 1986 and there are nationwide registers for housing, livestock, income data and other areas. Denmark has been number one in e-readiness for the last three years, according to The Economist’s Intelligence Unit and the IBM Institute for Business Value.

Key Facts

- **Organization:** Danish Government
- **Location:** Denmark
- **Solution:** Federation for government services
- **Launched:** 1st Quarter, 2008
- **Multi-Protocol Support:** SAML 2.0
- **Key Features:** Federated model promotes interoperability; Secure and private; Single sign-on
In June 2006, the parliament decided that open standards in all public sector solutions must be mandatory. The same year, it was decided that a citizen portal should be established and replace the municipal portal Netborger.dk and the governmental portal Danmark.dk.

The new portal would be called MyPage or Borger.dk and its goals include 1) to provide a more coherent user experience of public digital services 2) to make it faster and easier for citizens to become self-served through the Internet 3) to encourage the use of and the knowledge of digital citizen services and 4) to provide a window into the public sector and its democratic work.

So a comprehensive e-government strategy was developed with multiple initiatives, with one goal being that by 2012, all relevant written communication among companies, citizens and the public sector should be electronic.

These are big mandates even for a country as progressive as Denmark. The primary problem was that citizen activities were siloed. And individuals have been engaging with multiple agencies in different ways with multiple log-ins. The clear need for better integration across the government and private sectors sparked thought about what kind of solution would work best.

"Our first challenge was simply, How do we pass around the assertion of user identity in a scalable and secure manner?" said Søren Peter Nielsen, responsible for federation architecture in the Danish National IT and Telecom Agency. "So given the decentralized structure of our public sector, a federated solution seemed like the best fit.”
Denmark Tailors SAML 2.0 to Fit Its Needs

To provide a best-fit solution to the needs of the Danish people, Denmark slightly tailored the basic SAML 2.0 profile. This is because there were some cultural issues that needed to be addressed, like how to deal with business number identifiers. The Danish government also wanted to remove a degree of complexity so there were less variations to test, less variation around risk analysis, and simpler requirements for members that want to implement their own SAML integration.

Today, this profile, OIOSAML 2.0, includes Web single sign-on using redirect/POST binding with attribute mapping and persistent pseudonyms. SOAP binding is also included to provide single log-out and attribute query. Finally, attribute profiles are used to describe extra attribute sets that can be transferred as part of authentication assertions or attribute assertions. To a very large degree, the profile resembles the U.S. eAuthentication SAML profile.

“We don’t have huge resources, so it is important for us when we put in architecture and standards that we don’t have to do all testing from the bottom up, that we can ride on the back of somebody else. Once we have well-defined requirements, Liberty helps drive solutions and standards that test the viability of our project,” said Nielsen. “So it is important for us to have something that has some market support, something that some other countries also want to see—so that’s why it really makes a big difference that there is a trusted brand like Liberty behind us.”

He added, “The focus on solving real-world requirements in an open process assures the business side that the Liberty work is standardization to solve relevant problems and not just standardization for the sake of standardization.”

Liberty as an organization also benefits from Denmark’s work. “The appeal of the Liberty model is that the use cases of the customer members help drive the direction of the specifications and subsequent products from vendors, not only from Liberty vendor members, but increasingly from those vendors affiliated with other consortiums in the IdM space supporting other non-SAML protocols,” said Colin Wallis. “The openness of this approach means that contestability, come procurement time, is not compromised.”

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Teaming with Liberty Alliance

Denmark is an active member of the Liberty Alliance, having come on board in 2006.

Nielsen stressed that being a part of the Liberty Alliance was critically important for a number of reasons. First, Liberty is the “home” to SAML, and Liberty provides significant support and resources to members in the area of policy agreements, privacy, and use cases. Second, Liberty has market support and a strong brand. Third, Denmark wanted architectural- and standards-based support beyond its own local markets, especially in light of the larger EU eGovernment i2010 action plan.

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Timeline: Moving Towards a Standards-based Community

Before SAML-based federation, traffic to the existing Danish online e-government SSO-linked services was around 220,000 log-ins per month, representing approximately 100,000 users. Online services linked via the proprietary SSO-solution were fairly limited to three areas: self-service taxes, student loans, and state education grants.

In 2008, the Danish government will launch two waves of federation build-out. The first comprises one portal, 12 service providers, and 30 applications, while the second is planned to comprise three portals, more than 25 service providers, and 75 applications. Increased citizen use of the online community will expose solutions, and in effect guide the second wave of build-out.

"Today you can go online and see tax information, payments, deductions, etc.,” explained Nielsen. “In 2012 or 10, this will be further integrated so it’s not just tax information, but dependent child benefits, rental support, and information from a variety of sources, all accessed through a secure and private government dashboard.”

Nielsen reports that the government expects a direct savings per year of approximately DKK 20-30 million (Euro 2.4-2.7 million) using federation, if access management is included.

Furthermore, indirect savings offer the greatest potential. Today, many citizen-to-government processes are still mostly manual. They are part of a long tail of processes that cannot pay for developing a full-blown self-service solution on their own. This can, for example, be due to a limited number of transactions in a given process.

Still, these long-tail processes contain about 50% of the total citizen-to-government transaction volume. A common identity federation infrastructure, enabled via self-service solutions for these processes, yields dramatic advantages.

In one illustrative example, the time a business has to spend applying for a transportation permit can be cut by 57%, while the government agency can save 61% of their time processing the application. While the burden on private business is lessened and the government can process more applications with the same number of employees, the business will also get a much faster reply on their application. Thus, beyond the direct savings, the big win is the enabling common infrastructure that is created.

Existing Login Community

Current traffic: 220,000 logins per month ~ 100,000 users per month
Incentives to Standardize

The success of Denmark’s eServices will rest on the ability to encourage adoption among various service providers.

One of the challenges, explained Nielsen, is that different categories of service providers have different requirements. Nielsen said that his office, together with the federation operator (the Agency for Governmental Management), has worked hard to simplify and lower the costs of integration.

“We did things like encouraging the suppliers to create attractively priced starter packages. While many suppliers may have quite feature-rich solutions that are priced accordingly, the public sector institutions initially only need a very focused set of functionality. The response has been very good, and there are now several very attractively priced federation starter packages available on the Danish market,” he said.

His office also targeted suppliers of software-as-a-service, and organizations that were comfortable applying open source by releasing open-source SAML 2.0 integration toolkits on several platforms including .Net. Many Danish suppliers sell self-service solutions to Danish public sector organizations that they have developed in-house. In many cases, it is not attractive for the supplier to OEM a federation product to provide the required SAML 2.0 integration capability due to licensing issues, added product complexity, etc.

These suppliers would rather make SAML 2.0 e-Gov integration a native capability of their product. On the other hand, it requires time and skill to program SAML 2.0 integration from the bottom up. Supplying toolkits and reference implementation under an open source license that allows for use together with non-open source code helps. Availability of SAML 2.0 enables self-service solutions to be accelerated without making these solutions a lot more expensive due to the use of open source toolkits that are shared broadly. Also, public sector organizations that are comfortable using open source can program the SAML integration on their own using the toolkits.
Lessons to Share with the E-Government Community

Nielsen has been readily sharing his learning in workshops and federation seminars at different events around the world.

On the operate side, here’s what he’s seeing:

- Identity as a service is still far away. It’s difficult to promote the idea that an enterprise solution is a shared component.
- There’s more market choice now, making it easier to evaluate/compare solutions with a standards-based function set.
- Default logging capabilities in standard products may not always be sufficient for legal requirements.
- Not all federation productions support secure crypto HW storage of certificates.

On the risk analysis side:

- There should be no compromise on integrity and confidentiality. Availability can be adjusted as service provider volume grows.

Their POC generated some specific lessons:

- There’s a great advantage in doing configuration from metadata. Minor interoperability issues were encountered with some products, requiring the deletion of a few lines.
- They learned they needed to create a concept for co-existence with local federations.
- The IE browser may behave differently when running on non-standard ports (as the POC did).

Federation Development Plan Phases

1) Web SSO: Primarily for citizens and employees logging in with digital signature
2) Power of Attorney & Consent: Shared solutions/standards
3) Government-to-Government SSO: Each authority can have its own authentication point
4) Federated Provisioning: Enables one-stop administration
5) Analysis of potential for common roles

The Steps to Federation

- Architecture and standards work since 2004
- Business case reporting 2005
- Analysis of potential operators in 2006
- November 2006: Decision to start planning
- Forming the federation
- January 2007: Proof of Concept
- May 2007: Federation formed and operator chosen
Moving to the Future

With its full-on embrace of SAML, Denmark is poised to enable cross-country federations. And Liberty is poised to play a key role.

“Even worldwide, the federation community is small,” said Nielsen. “In Denmark, you don’t have a lot of people to play ball with, so Liberty is a great place to simply discuss issues—technology and otherwise.

“We also see Liberty being able to play a role in the work EU is undertaking to enable federation between member states. Examples are the inspiration Liberty brought to the architecture of the GUIDE EU project, as well as the good alignment between the work going on in the current eID project in EU and the Liberty Identity Assurance Framework.”

“While it may seem that federation had its 10 minutes of fame among industry thought leaders, our sense is that federation is maturing into what’s ordinary and expected,” said Nielsen. “Federation will enable new solutions, as well as improve efficiencies in what’s already out there. We could be further along the curve with new innovative applications if the industry had been able to converge on one common federation plumbing. That’s our focus now. Finding ways to make everyone’s plumbing converge.”

Sampling of Danish Companies Supporting SAML

As the Danish project gains in popularity, a diverse range of companies are supporting the government’s goals and enabling SAML-based solutions.

They include:

- **Safewhere** ([www.safewhere.net](http://www.safewhere.net)) an access management company
- **Tabulex** ([www.tabulex.dk](http://www.tabulex.dk)) an IT solutions provider that delivers services to young people
- **KMD** ([www.kmd.dk](http://www.kmd.dk)) a local authority services company
- **EDB Gruppen** ([www.eg.dk](http://www.eg.dk)) an IT solutions provider specializing in ERP
- **Assemble** ([www.assemble.dk](http://www.assemble.dk)) a developer of digital management services and products for e-government
- **ResultMaker** ([www.resultmaker.com](http://www.resultmaker.com)) a workflow automation company
About Liberty Alliance

Liberty Alliance is the only global identity organization with a membership base that includes technology vendors, consumer service providers and educational and government organizations working together to build a more trusted Internet by addressing the technology, business and privacy aspects of digital identity management. The Liberty Alliance Management Board consists of representatives from AOL, BT, France Telecom, Intel, Novell, NTT, Oracle and Sun Microsystems. Liberty Alliance works with identity organizations worldwide to ensure all voices are included in the global identity discussion, and regularly holds and participates in public events designed to advance the harmonization and interoperability of CardSpace, Liberty Federation (SAML 2.0), Liberty Web Services, OpenID and WS-* specifications. More information about Liberty Alliance as well as information about how to join many of its public groups and mail lists is available at www.projectliberty.org.