

## **Case Study:** **North East England Sets the Pace for Innovations in Federation**

### **Lead Organization**

Sunderland City Council, local government for the city of Sunderland in the North East of England.

### **The Challenges**

To deliver joined-up services to English citizens via smart cards designed with maximum security and privacy protection. The smart cards must support electronic ticketing, user-related information, and stored value.

### **Sunderland, England:**

#### **Home to a Smart Card Federated Pilot**

Local authorities in the North East of England are setting the pace for innovation in e-government, and Sunderland is leading the development of a large-scale, 80,000-user, Java Card technology-based prototype infrastructure. This prototype is designed to make it easier for service providers, in both the public and private sector, to deliver smart services at an affordable entry cost.

Cardholders have single sign-on (based on Liberty Alliance specifications) authentication at their portal of choice using open-source PKI and Java Card technology. They can order and configure a range of payment solutions, secure ID functions, government services, and even secure electronic tickets (following the European ITSO specification for interoperable ticketing).

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To support the card, Sunderland City Council designed, developed, and deployed what is called the Trusted Services Infrastructure (TSI) for the North East Connects Partnership (NE Connects). NE Connects ([www.ne-connects.org.uk](http://www.ne-connects.org.uk)) is an e-Government Partnership established to promote and coordinate electronic government initiatives in the North East. All 25 North East local authorities are members of the partnership, representing 2.7 million citizens. The partnership will seek to mainstream and develop the pioneering work of the North East Regional Smartcard Consortium (NERSC), which laid the initial foundation of the Trust Services Infrastructure.

"We'd done a lot of thinking around how smart cards might be a good way to deliver services in the future," says Crawford. "We were looking at how tokens could move between different systems carrying entitlements and identities. That's basically why NERSC was formed—to figure out what was possible and to see if we could build a smart card platform."

The assumption at this time was that the smart card would have a "killer" application residing on it—an application every citizen needed access to on a daily basis—like public transportation. The theory then was that the local transportation authorities would lead the way and have other local government applications, like leisure and libraries, piggyback on top of them. Crawford says their strategy and thinking was wrong for the North East, so they had to quickly shift gears.

"We found that it was a lot more difficult to align transportation applications than we thought," he says. "Transportation by its nature is large-scale and often cumbersome because it involves many parties. And in the UK, the transportation industry was also coping with the need to develop its own standards to achieve offline 'ticketing' interoperability—so nothing was moving at the

## Definition of Terms

**Identity** (n) 1. the most basic element in a high value relationship 2. the individual characteristics by which a person, business, business partner, government agency or other entity is recognized or known

**Single sign-on** (n) 1. having the capability of accessing an online system once and having that authentication honored by other system entities, often service providers 2. sometimes called SSO

**Identity Provider (IdP)** (n) 1. a service that authenticates identity; often a trusted party such as a bank, mobile operator, or an

**Internet Service Provider (ISP)**  
**Service Provider (SP)** (n) 1. a federation partner that provides services to an end user; service providers typically do not authenticate users but instead request authentication decisions from an identity provider

**Federation** (n) 1. an association comprising of any number of service providers or organizations 2. a model based upon trust in which user identities and security are individually managed and distributed by the service providers or member organizations 3. where the individual organization is responsible for vouching for the identity of its own users and the users are able to transparently interact with other trusted partners based on this first authentication 4. resembles the credit card model in that vendors accept an individual's ability to pay and then that ability is authenticated/verified through a single location

**Circle of Trust** (n) 1. a trusted group of identity and service providers who share linked identities and have pertinent agreements in place 2. where an individual or a business inputs a password once and minimal necessary credentials are shared among the Circle of Trust's members 3. a step strongly linked to federation, where multiple entities are involved, and there are business, policy and technical relationships in place 4. also known as "trust circle"

pace we in government wanted to or thought we had to.” At the same time, a national e-government initiative was taking hold and British officials were looking at new ways to provide government services to citizens. “To make e-government authentication reliable and trustworthy, we really needed to look at Java and a kind of smart card that would support multiple certificates. This really upped the ante,” says Crawford. “This was very different from our initial approach, which only required a cheaper memory card with a contactless interface for transportation.”

While the NERSC Team had set out to match up legacy local government applications with leisure and transportation ones, it was clear the task had to embrace service transformation; new business models and apparently inexhaustible demands for technical investment. A vision of shared infrastructure appeared the only sensible course. “As we began to work toward supporting a common infrastructure, we began to really see the need for more identity management, specifically federated identity management,” he says. “We recognized that without something like federation, we’d potentially have a big shared-services problem.”

### **Acceptance Is a Challenge**

According to Crawford, with deployments of this scope, it is one thing to recognise a requirement, but harder to grapple with the reality of trying to do something about it. “Persuading the holders of local authority purse strings to make an open-ended commitment to a region-wide shared infrastructure, particularly with a core of identity management, when the prevailing talk was of national identity cards and databases, was always going to be a tall order,” he explains. “We took some comfort from recognizing that the banks had already been there and that mobile telecommunications and transport were now also facing up to issues of convergence and interoperability—indeed we asked ourselves if we could leverage their investment. The answer was some cautious interest from these sectors—but first we would have to find a common language—both in technology and business terms. This is why Liberty looked so interesting.”

And according to Crawford, the benefits of federation were clear.

**They included:**

- Extension of reach
- Easy use of more compelling channels and offers to reach target customers
- Build once—use many times—economies of scale with built-in avoidance of redundancy and duplication
- Inherent interoperability

### **TSI Meets the Liberty Alliance**

It was 2003 and the newly formed Liberty Alliance caught the attention of Crawford's team. Crawford had actually read an article about Liberty in The Register, saw that Sun Microsystems was a key player, and then asked his account manager to help his team find out more.

"Introductions were arranged with Robin Wilton and Hellmuth Broda who were both more than willing to spend time helping us understand what looked like a daunting range of materials," he says. "I was also encouraged by the warmth of and openness of people like Linda Elliott at PingID and Drummond Reed at XID, both whom amazed me by responding to our emails, questions, and observations so readily."

After a period of knowledge gathering, the decision was made to use the Liberty standards in order to have the most flexibility. "We didn't want to limit the project to only services in the North East, and we wanted to be able to link to other infrastructures and extend the reach of our services. We felt Liberty was ideal for that," he says. "No one knew what anything looked like yet, but we did know that there were emerging standards, so we just decided to build a prototype and then try to refine it. Our hope was that market interest would follow."

Crawford says at first he and his group assumed they would be "a bit of a mismatch" at Liberty because they represented

“Federation comes in linking the bank and our card management system together so we can support our Secure ID and ticketing applications on bank cards. It can enable a lot of community-level activity providers from the smallest youth club, scout group, or even karate club to provide the young person with relevant offers and information based on the consents and attributes that the young person has chosen to reveal. It may eventually offer a new paradigm in the provisioning of services to young people.”

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a relatively small government entity. “We’re not a global organization and we worried that we might feel lost. But the reception at Liberty was always very warm and we got a lot of support and encouragement to move forward.”

It’s this collegial work environment that Crawford says is one of Liberty’s strengths. “People share a great deal of knowledge about where they’ve been and what they’ve learned. This sharing helps us move up the learning curve faster.”

### **Testing the Project at a College**

Crawford launched a pilot in 2003/4 with a project to support a local college, which included the provisioning of local log-in, building access and network log-in for some 400 users. In September 2005, NECP deployed 8,500 smart cards for the University of Sunderland Student Union. The cards hold membership details, discount privileges and digital certificates to authenticate online services. NECP is continuing to develop working relationships with other private and public sector organizations, notably software company SAGE, for whom the partnership has already supplied access control smart cards for systems at the company’s global HQ in Newcastle Upon Tyne. To create this smart card-enabled offering, Sunderland has partnered with ActivIdentity, a Fremont, California-based developer of digital assurance solutions and a sponsor member of the Liberty Alliance. ActivIdentity provides a complete platform for the secure issuance, management and use of digital identities. This platform consists of strong authentication, enterprise single sign-on, and enterprise access card solutions. The ActivIdentity Solution comprises ActivIdentity Card Management System (CMS), which merges the issuance, support and administration of authentication devices, digital credentials and the associated user data into a single, intuitive, Web-based management interface. The Web-based architecture enables geographically dispersed locations to easily and securely provide the same issuance, management and maintenance functions to appropriate people across the entire organization.

## **Extending the Concept to a Youth Opportunity Card**

After the successful launch of the University pilot, Sunderland set out to develop a card offer that would have more widespread acceptance for all young people in Sunderland. One requirement was to provide an improved way for this group to handle money—money that was often obtained from family and friends rather than through employment.

“We saw that the limited e-purse and stored value functionality which we could offer on our existing platform—for example supporting ‘cashless meal’ systems—wasn’t really up to the job. What we really wanted was convergence with banking systems—in order to avoid risks which banks are better placed to cope with, and to leverage their established infrastructure and reach into the high street—the ultimate destination for most young people! The real challenge was how to persuade a bank that our registration, enrollment and provisioning capability was up to the task of satisfying ‘Know Your Customer’ requirements,” says Crawford.

The adoption of Liberty standards for Federated Identity Management is a key part of the strategy here, but it offers much more than just a common language for specifying processes and protocols.

Crawford explains that banks will often spend a lot of money to obtain a young customer, but they are equally wary of being seen as encouraging a credit culture in the young. In light of these challenges, new banking products such as pre-authorized debit (PAD) could be offered as minimalist ‘white-label’ bank cards operated by third parties which may be effective introductory channels to good money management. “Federation comes in linking the bank and our card management system together so we can support our Secure ID and ticketing applications on bank cards,” says Crawford. “It can enable a lot of community-level activity providers from the smallest youth club, scout group, or even karate club to provide the young person with relevant offers

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Federation enables service providers to know who is consuming what, and it enables them to tailor offers and be more responsive.

For example, a group contemplating offering a new activity at the local community center might not be sure what the demand for their course would be. With the card, they can offer 50 percent off the first session and sell the tickets via the Web site and continue to promote the event right up to the day of the session. “Young people will actually hear about events upfront right until the event, and this makes it much more possible to plan and organize services cost-effectively,” says Crawford.

Perhaps the most interesting aspect however is the possibility that, in their secure personal ‘federation’ space on the Sunderland portal, the user can be presented with tools that enable the real-time visualization and management of data consents. Service providers depend on a positive consent to “join the party” and will be attracted to portals that can deliver the consents they need, but this also creates the possibility that users can regulate the performance of the provider by comparing it with other service providers and amending consents as appropriate. Even the temporary removal of a consent can automatically suspend the process involved in the delivery of a service—sending a direct signal to “buck-up” to the provider—without having to resort to threats of litigation, etc. Crawford argues that this approach may be the basis of “scrutiny” of participation, user-centricity and real “e-democracy.” It’s not hard to see why local authorities would be interested in such a powerful capability.

## **Sunderland Honored for Java Application**

The development community is taking note of Sunderland’s work. Each year, Sun Microsystems, a Liberty founder, honors the most innovative Java technology-based applications with their Duke’s Choice Award. The City of Sunderland Java Card application was recently honored in their Java Card category.

In its fourth year, the Duke’s Choice Awards attracts a wide range of submissions from developers and companies around the world. The winners are selected by James Gosling, vice president and Sun fellow, along with a panel of Java technology experts at Sun. “It is encouraging to see how much innovation is coming from the regional public sector,” said Hellmuth Broda, Distinguished Director and Chief Technology Officer, Global Government Strategy, Sun Microsystems, Inc. “Extremadura in Spain fully embraced Open Source and OpenDocument Format, Munich went for Open Source and now the city of Sunderland not only joined the Liberty Alliance to embrace open interoperable identity management but excelled with a Java application that gives the City the flexibility for future applications using its identity smart cards in the region. The Duke’s Choice Award is a well earned recognition which shows that regional bodies can outpace national governments in innovation and services for their citizens.”

## **The Central Government Ups the Ante**

The thinking that Crawford's team has been pursuing was made more relevant with the announcement of a central government scheme called the Youth Opportunity Card (YOC).

The UK government intends to investigate whether monthly payments made to disadvantaged young people aged 13–19 years old will encourage them to participate in constructive activities.

Sunderland is to be one of ten pilots, involving up to 300,000 young people, which, if the pilots are successful, will serve as the basis for a National Youth Opportunity Card. Sunderland's solution will be based on the user technologies described above, and will specifically feature the use of Federated ID Management to increase the scope of activities offered through the scheme.

The "YOC" is a £30M part of a larger "Youth Matters" project, with the UK government setting aside a fund of £115M for young people around England to engage in leisure and volunteer activities.

There is enormous momentum behind this initiative because local communities throughout England have been complaining that there is nothing for young people to do and that local facilities are not relevant to the interests of young people. And without relevant activities, the general consensus is that young people are more inclined to engage in anti-social behavior.

"This is a ground-breaking approach to tackle both these issues in the communities that need it most. We believe that putting trust in young people and giving them responsibility will play a key part in tackling anti-social behavior," said Beverly Hughes, England's Minister of Children. "This is a new form of Government evolving right down to local people including teenagers as young as 13 having influence over a multi-million pound package." Funding of £115M will be available over two years through the

Youth Opportunity Fund and the Youth Capital Fund: ring-fenced money that young people will be able to bid for from their local authorities to improve facilities and activities in their neighborhood.

This means that around £500,000 will be available in an average local authority, and over £2M in the very largest and where the need is greatest over the next two years.

With the Youth Opportunity Card and other “smart” federated applications, North East England is emerging as a hotbed of technology innovation. Sunderland has taken the Liberty specifications and uniquely “run with them” to serve local citizens—and in the process, they’ve set an example for what could be possible throughout the UK.

“We believe that federation and the Liberty standards can transform local government,” says Crawford. “It’s very exciting to see an idea become a reality and witness the impact on our citizens’ lives.”

## ABOUT THE LIBERTY ALLIANCE

Liberty Alliance is a global alliance of companies, non-profit and government organizations developing open standards for federated network identity, interoperable strong authentication and Web services. Liberty Federation and Liberty Web Services provide consumers and organizations with a more convenient, privacy respecting, and secure way to control online identity information. A list of organizations deploying Liberty Federation and Liberty Web Services is available at <http://www.projectliberty.org/about/market-adoption.php>. The Liberty Alliance management board currently consists of representatives from AOL, Ericsson, Fidelity Investments, France Telecom, General Motors, HP, IBM, Intel, Novell, NTT, Oracle, RSA Security and Sun Microsystems. Membership in Liberty Alliance is open to all commercial and non-commercial organizations. A full list of members, as well as information about how to become a member, is available at [http://www.projectliberty.org/membership/become\\_member.php](http://www.projectliberty.org/membership/become_member.php).