A Developer Overview of Government Gateway Services

Background

The Government Gateway is the cornerstone of delivering joined-up, online government services in the UK. It provides:

- an authentication and authorisation facility – to ensure that users are who they claim to be and that they have the right to access a specific service or set of services

- single sign-on and single-credentials across all government services, national, regional and local – ensuring that users can have one user ID and password, or a digital certificate, for use with all online public services

- a transaction and routing facility – ensuring the reliable delivery of documents and messages. This includes documents between business and citizens and government, as well as the authenticated routing of documents between government organisations

- a secure messaging facility – enabling secure communication between business, citizens and government organisations

- an integration tier – offering reliable delivery of standards-based information into the connecting organisation, including the option for customised local integration into existing systems and applications

- a payments facility – offering both unauthenticated and authenticated payments, ranging from credit and debit cards through to direct debit

The Gateway is part of the UK's critical information infrastructure and provides a highly secure environment, a resilient "always on" service and a capacity to handle high volumes.

Open Interoperability Standards

In accordance with the open interoperability standards mandated in the e-Government Interoperability Framework (e-GIF) issued by the Office of the e-Envoy, the Gateway exposes all of its service using:

- XML (using GovTalk schema)
- SOAP (for web services)
- HTTP and HTTP/s

The consistency and openness of its interfaces simplifies the development and delivery of e-government services. Developers can focus on tackling the specific business issues of a particular service and rely on these consistent and common interoperability standards to build and develop their application.

As well as full support for HTTP (including HTTP under 128-bit SSL) and a standard set of URLs, the Gateway also exposes various programmatic interfaces making use of web services. These enable a developer to:

- make calls to the Gateway's single sign-on authentication and authorisation web service, ensuring that users can be verified (they are who they claim to be and that they are authorised to carry out a particular service)
- submit transactions to the Gateway and poll-for the results
- make authenticated calls to the Gateway's secure messaging facility, either rendering it within a web site, or programmatically accessing the content and retrieving it into an application for onward processing
- perform a range of other Gateway functions (such as registering and enrolling a user) without the user ever having to directly visit the Gateway. This enables portals and web sites to use single sign-on within their own web sites whilst retaining the direct customer relationship themselves.

Developer Interfaces Overview

The schematic shown below illustrates the interfaces and facilities available to developers from either online applications such as those within portals or from dedicated application software.
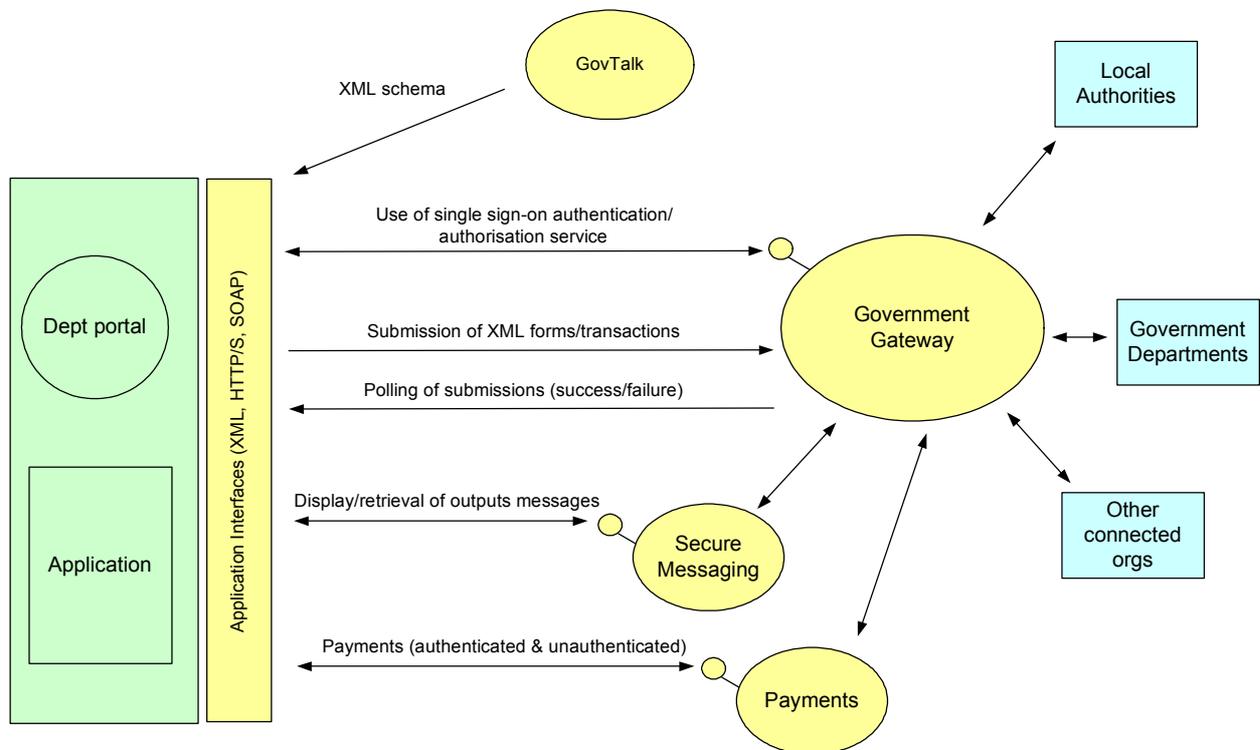
As well as routing from business and citizens to government, the Gateway also routes between government organisations. An application within a local authority for example can submit and exchange messages with other Gateway-connected organisations such as other local authorities, central government departments and so on.
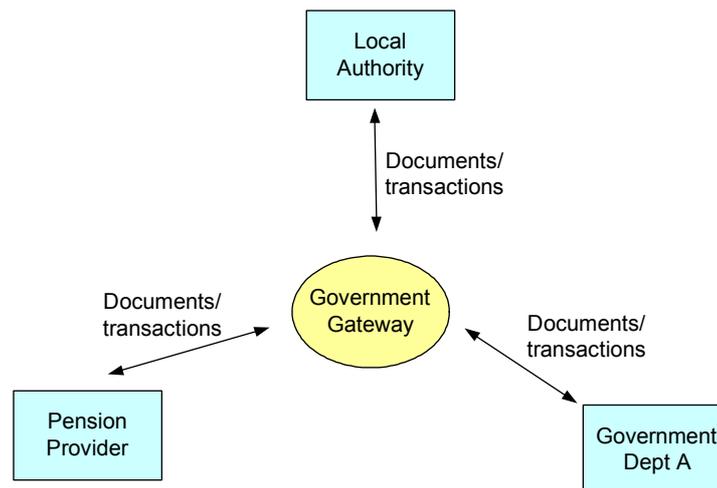
Key Gateway Functions

Identification and authentication

The Government Gateway's authentication and authorisation service, which provides a single sign-on facility usable across all e-government services, simplifies the task of ensuring that a user is who they claim to be and that they have the right to use the service concerned. A developer can call this service to help ensure that portals, web sites and applications they develop use the secure, single ID for citizens

and businesses: the same credential (user ID and password, or digital certificate) that can be used across all government services.

Routing of XML e-forms

e-service delivery via the Gateway – courtesy of its XML routing facilities – provides a single route into all government systems and so masks the complexity of back-end government systems. Instead of developers coding against several hundred different government delivery points each with their own interfaces and standards, the Gateway provides a common delivery point and consistent set of open interoperability standards for developers to code against. As well as citizen to government and business to government interactions, the Gateway also handles government to government interactions.

Secure message delivery

The authentication and authorisation facilities of the Gateway provide a secure environment for both inbound and outbound communications. This core element of Gateway functionality is provided to all Gateway-enabled services and is accessed either via a UI, or programmatically via the web service interface.

Developer options

The process for developing and using a schema is overseen by the GovTalk initiative. Developers have two opportunities in the cycle to actively engage with a project:

- **developing a schema**. If there is no schema already developed for the specific e-service through the Gateway, a department or other government organisation will need to develop one. Schema should be drafted and published for consultation. Areas of potential reuse should be highlighted. This will maximise the opportunities for interoperability.

- **using a schema to develop an application**. If there is already an agreed standard schema available the developer can join the development cycle at this stage and work on developing, testing, certifying and launching their specific application.

Test facilities

The Gateway offers a free, comprehensive test service for developers. This service mirrors the live Gateway service. When a test message is sent the test service confirms whether or not it was successful. Once an XML document is ready to proceed to the certification stage the test service issues a test identification reference. The XML must also be tested through the government organisation's systems to assess its ability to conform to existing business rules. Some organisations may choose to integrate these two test facilities into a single test sequence.

Transaction delivery confirmation

Once the Gateway has received an XML transaction, it applies a timestamp to that transaction. The transaction is then authenticated and passed on to its intended destination. A confirmation is automatically issued to the citizen or business using the service. This timestamp provides reassurance that government has received the transaction. If, for some reason, the organisation concerned is not available to receive the transaction, then the Gateway will store the transaction until the organisation is ready to receive it. This process ensures that forms will not be 'lost in cyberspace'. This can be critical since some of the transactions with government have a penalty associated with them if the transaction is delivered late.

Capacity

Since being launched the Gateway architecture has proven that it can handle large volumes of traffic on an ongoing basis. The Gateway is currently supporting peaks in submissions for self-assessment and PAYE.

Ongoing enhancements, support and updates

The Gateway developer community and Office of the e-Envoy Gateway team are continuously looking at ways to enhance service delivery and transactions through the Gateway. All Gateway configured services will benefit from these enhancements. Since the Gateway went live these enhancements have included an electronic help desk tool, improved test service functionality and a secure messaging service. To

receive notification of changes and Gateway news, simply register for the Gateway Update e-newsletter on the www.govtalk.gov.uk/gateway_partnerlink web site.

Established infrastructure

The Gateway approach to the delivery of e-government services is approved by the e-Envoy, Andrew Pinder, and the Secretary for Trade and Industry, Patricia Hewitt. The e-Envoy is the Senior Responsible Owner. The Gateway also has support from Lord Macdonald, Minister for the Cabinet Office and Chancellor of the Duchy of Lancaster. Lord Macdonald is the e-government minister, responsible for getting government online.

Launched in January 2001, the Gateway is an established cornerstone of e-government, already being used by a range of government departments. In central government these include the Inland Revenue, DEFRA and Her Majesty's Customs and Excise. This common infrastructure enables the consistent, secure and cost-effective delivery of e-government services. The infrastructure in place has been tried and tested and is recommended for use by government departments, local authorities or other government organisations developing e-services. This will save departments and authorities from having to redevelop core components such as authentication, routing of e-forms between citizen, business and government organisations and secure messaging. Since all of the services are exposed using consistent and open interoperability standards, applications can easily make use of these facilities.

Regular independent reviews of the Government Gateway project have been carried out, in collaboration with the Office of Government Commerce, to ensure best practice is applied to all areas of the Gateway's procurement and governance. These have included checking that there are mechanisms in place to track and manage all risks associated with the delivery of this critical national IT infrastructure.

The Government Gateway has proven to be scalable, secure and reliable. Inland Revenue, DEFRA and HMCE all use the Gateway for their e-service transactions, and more departments and local authorities are in the process of connecting to the Gateway.

Getting a Service online with the Gateway

Building and using a Gateway configured e-service involves six basic steps for the developer. There are two potential entry points for developers, as indicated by the asterisks in the steps below. Note that prior to any development work, the central or local government organisation must have installed and configured a DIS box, which provides the guaranteed, authenticated XML and SOAP-based messaging link between the Gateway and the organisation.

Step 1 - Start an XML schema*

XML schema are generally initiated by departments or local authorities. One of the first steps for departments and authorities is to identify the stakeholders who may be interested in assisting in the development of the schema, and providing feedback. This process is described within the *e-Services Development Process Guidelines* available on the www.govtalk.gov.uk/gateway_partnerlink web site.

The production and publication of two documents is recommended: a requirements specification and a schema specification. In producing the XML schema, reference should be made to the 'XML Schema Guidelines – best practice advice' paper.

Step 2 - Approved schemas

The outcome of the schema development process will be a final, agreed standard schema. Approved schema will be published and openly available on either GovTalk or the government organisation site, or both.

Step 3 - Use an approved schema*

Schema that are finalised are publicly available for use. Any developer wishing to develop software that complies with a schema should ensure that they are using the final version of the schema and that they are not developing to a draft schema (i.e. ensure it is a baselined version).

The schema must NOT be modified. Any schema that do not comply with the requirements of the Gateway will not be accepted. Any suggestions for future modifications to the schema should be sent to

the schema owner so that the process of managing a migration to an updated schema can be fully co-ordinated between all relevant parties.

Step 4 – Build and Test the Application

Once developed to a suitable point, the developer sends a test message from their application through the test service. When a test is successful the application receives a test identification reference. If the test is not successful, then an error message is generated. The developer needs to respond to the error message, make the appropriate changes, and resubmit the message.

Step 5 - Certify the Application

After successful testing, the application must be registered with the relevant authority by providing the test identification reference, which is checked and then certified.

Step 6 - Launch the e-service Transaction

The application is made accessible for use by citizens, businesses and their agents.

Useful resources

The following publications are available online on the www.govtalk.gov.uk/gateway_partnerlink web site.

Gateway Publications

- **Document Submission Protocol** - specifies the submission and query protocol implemented for the Government Gateway. The submission and query protocol defines the interaction between client applications (browser or server based) and the Gateway. Essential reading for any developer looking to use the Government Gateway

- **New Certificate Providers -** intended for certificate authorities, this document provides the information required for new certificate providers that intend to use the Government Gateway

- **Quality Review of Address Types** - quality assurance of Address Types schema against schema guidelines and GDSC

- **Secure Messaging - Digital Mail Envelope** - defines the protocol used for secure messaging. It details the interaction with the Gateway including the error messages and administration that are essential to the service

- **SOAP Programmatic Interface Specification** - describes the programmatic interface to the Government Gateway secure messaging service. The audience for this document includes; architects, developers and other parties interested in building Gateway client applications

- **XML schema guidelines** - contains guidelines for developing XML schemas for e-GIF compliant systems. These guidelines include mandatory requirements for XML schema structure and content, as well as best practice recommendations for schema design

Schema Development

- **e-Service Development Framework (eSDF)** - Provides a methodology for developing interoperability specifications for use in the public sector. The focus is on preserving the information content so that the information receiver can use it without loss or change of meaning.

  The Primer is set out in four sections:

  1. The e-Service Development Framework;
  2. The specification of functional requirements;
  3. Context-independent, technology-neutral design;
  4. Implementation using XML schema

- **e-Services Development Process Guidelines -** provides a set of guidelines to assist in the development of e-services and the production of XML schemas in accordance with the e-GIF.

This document includes a list of suggested deliverables for key stages in the process. It also contains diagrams illustrating the management process for the publication of schemas

- **Government Data Standards Catalogue** - describes reusable data elements and data types

Admin schema are used for the exchange of key information between the Gateway and connected government organisations. For developers, the key schemas are the GovTalk Envelope, Error Response and authentication schema. In addition, there are schema that need to be supported by the back-end systems. Departments and local authorities will need to be aware of the full set of administration schemas as they are required to support the registration and enrolment process. These administration schemas are available within the interoperability section on the GovTalk website.

- **envelope-v1.xml** - this schema is used as the envelope for all GovTalk messages that use the Government Gateway

- **errorResponse-v1.xml** - this schema is used for errors returned by business systems. In these circumstances, the header contains a single error element of type "business" and the body contains further information. An updated version of this schema (v2.0) will be released shortly. It is envisaged that v2.0 schemas will go live in June 2002.

- **GovTalk envelope** - enables correct processing, routing and delivery of a message through the Gateway. This is the version to be used in the first release of Government Gateway. Changes from v0.9 are to allow an empty element and to give the element global scope. Both these changes are upwardly compatible from version 0.9 and so will have no impact on existing implementations. An updated version of this schema (v2.0) is now being implemented.

Further Information

More details are available from the Office of the e-Envoy (www.e-envoy.gov.uk) and the developer site at www.govtalk.gov.uk/gateway_partnerlink.

Departments or other government organisations requiring assistance in developing or launching Gateway-enabled services should send an email request to:

gatewayservices@cabinet-office.x.gsi.gov.uk

Queries from partners or developers, and comments about the site structure or content, of the Gateway Partnerlink site should be sent to:

gatewaypartnerlink@cabinet-office.x.gsi.gov.uk