Gateway, the Process and the Program

Leveraging Service Oriented Architecture, Open Standards and Open Source Software to build a reliable, robust, and function rich application.

I will start by talk about how Service Oriented Architecture, Open Standards and Open Source Software helped the Vermont Department of Taxes build a reliable, robust, and a function rich application.

There will be a brief overview of the Gateway’s architecture. Followed by a summary of the function for Streamline Sales Tax and Modernized eFile processing as well as some of the other common functions of the Gateway project.

I will show how other states have gotten involved and how even more state tax/revenue agencies can benefit from this project.

Lastly a small demo and time for questions.
Vermont joined the Streamline Sales Tax (SST) project in the Fall of 2006.
At that time, we were very close to having our enterprise (backend) system ready to process SST Registrations and SST Returns.
The issue was how to get those registrations and returns into that system when XML, SOAP, and Web Services were not readily supported by our COBOL applications that feed our enterprise system.
That fall we had three developers, some tools and training, but what we did not have was a single line of code.

For the Gateway Project we would use the following:

- Open Standards
- Open Source Software
- Open Architectures

Agile / eXtreme development practices

The Gateway
Manifesto for Agile Software Development

We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value:

- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

That is, while there is value in the items on the right, we value the items on the left more.

Kent Beck  James Grenning  Robert C. Martin
Mike Beedle  Jim Highsmith  Steve Mellor
Arie van Bennekum  Andrew Hunt  Ken Schwaber
Alfie Cockburn  Brian Beitz  Jeff Sutherland
Ward Cunningham  Roy Jeffries  Dave Thomas
Martin Fowler  Jon Kern  Brian Marick

Timeline

- Short iterations with short development window.
- Working closely with fellow developers and business users.
- Test driven Development
Service Oriented Architecture (SOA)

The guiding principles of Service Oriented Architecture [1]

- **Service encapsulation** - Many services (most commonly web-services) are consolidated to be used under the SOA Architecture.
- **Service loose coupling** - Services maintain a relationship that minimizes dependencies and only requires that they maintain an awareness of each other.
- **Service contract** - Services adhere to a communications agreement, as defined collectively by one or more service description documents.
- **Service abstraction** - Beyond what is described in the service contract, services hide logic from the outside world.
- **Service reusability** - Logic is divided into services with the intention of promoting reuse.
- **Service composability** - Collections of services can be coordinated and assembled to form composite services.

Guiding Principles continued

- **Service autonomy** – Services have control over the logic they encapsulate.
- **Service optimization** – All else equal, high-quality services are generally considered preferable to low-quality ones.
- **Service discoverability** – Services are designed to be outwardly descriptive so that they can be found and assessed via available discovery mechanisms.
Open Standards

XML
SOAP
Web Services
TIGERS, SST and IRS shared standards and schemas
Java Virtual Machine, JavaEE(J2EE), JavaServer Faces (JSF)

Open Source Software - Libraries

- Web Services Engine / an implementation of the SOAP
  - Axis

- Object / relational persistence and query service abstracting the database layers
  - Hibernate

- XMLBeans is a technology for accessing XML by binding it to Java types
  - XML Beans

- A flexible/robust logging tool that allows the users to make configuration changes at runtime
  - Log4J

- A set of libraries to simplifies the building of user interfaces for web applications.
  - JavaServer Faces
**Open Source Software – Developer Tools**

- **Eclipse**
  - A very flexible and powerful IDE that support many programming languages, frameworks and other development tools.

- **Ant and Maven**
  - Ant is the de-facto automated build and deploy tool. Maven is more sophisticated in managing software dependencies, builds, and documentation.

- **Firefox and Firebug**
  - Firefox is flexible, and more open alternative to IE, with a lot of community developed plug-ins and including Firebug.

- **Subversion and Trac**
  - Subversion is our Version Control application. With Trac, it assist with Change Management and Incident Tracking.

**Open Source Software – The Stack**

- **Linux**
  - Linux is the well known name of open source UNIX like Operating Systems, the Gateway runs on Debian.

- **JBoss**
  - JBoss is the most popular of the open source implementation of the JavaEE (J2EE) framework.

- **MySQL**
  - MySQL is one of the most popular Database Management Systems (DBMS) in the open source market.
Gateway program overview

The Gateway is a suite of tools used to receive and send XML files through web services. The following is a outline of Vermont SST process.

The following is a outline of Vermont MeF process.
What the Gateway is, the Program

Functions for Streamlined Sales Tax processing:

- Processing SST Registrations
- Processing SST Returns
- SST web based UI
- Transmitter Sync. Process
- MeF / XML document viewer*
- Client Application w/ command line interface*
- Client Configuration Application*
- SST testing client
- Mock SST Registration Server

*Common functions of the Gateway

What the Gateway is, the Program

Functions for Modernized eFile processing (work in progress):

- Processing MeF Returns
- Processing SST Returns
- MeF / XML document viewer*
- Client Application w/ command line interface*
- Client Configuration Application*
- SST testing client
- Mock SST Registration Server

*Common functions of the Gateway
Other by-products of the Gateway project:

- Maven-har-plugin
- Maven-sar-plugin
- TMX Editor
- Locale4j
- Gateway Anti-Virus
- Inoclam
- Cshampoo

How the Gateway has Given Back to the Community

How other state tax/revenue agencies can benefit.
How the Gateway has Given Back to the Community

How other state tax / revenue agencies can benefit.

How tax software vendors can benefit.

How others can benefit.
How the Gateway has Given Back to the Community

How other state tax / revenue agencies can benefit.

How tax software vendors can benefit

How others can benefit.

How open sourcing the Gateway benefits the Vermont Department of Taxes.
Conclusion & Time for Questions

What is in Store for the Future of the Gateway and the Gateway’s Process

– SST
– MeF
– FSET
– And who know where else.

Contact Information

Welcome to the Gateway Project Website

The gateway is an Open Source Java application developed by the Vermont Department of Taxes. It provides a web services framework for accessing SST, MeF, FSET, and more. It also includes a web interface for manually submitting transactions. The goal is to build an extensible framework upon which future tax services can be built. See the Gateway Website for additional information about the project. Currently development is underway to support Modernized eFile by 2009. More details on our MeF development can be found here.

Project News

Modernized eFile Development

Continuously updated information about our Modernized eFile Development is available at http://gateway.sourceforge.net/mef.

April 09, 2008 - Gateway Client 4.5.3 Released

April 08, 2008 - Gateway Client 4.5.2 Released
Where to find out more:

Gateway Demo Site (the portal and web service)
http://gateway-demo.osuosl.org/

Gateway Project Page (documentation, presentations and other project info)
http://gateway.sourceforge.net/

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