



**GRANTS.GOV AND AGENCY
SYSTEM-TO-SYSTEM
INTEGRATION TEST PLAN**

Systems Integration

Version 1.5

October 8, 2003

*This report is confidential and intended solely for the use and
information of the client to whom it is addressed.*

Table of Contents

<i>Overview</i>	5
Objectives	5
<i>Preliminary Steps in Preparing to Integrate with Grants.gov</i>	5
<i>Testing Process</i>	6
Test Roles and Responsibilities	8
<i>Create Test Data</i>	8
Create and Publish a Funding Opportunity (Agency Role)	8
Applicant Registration (Applicant Role)	9
Download An Application Package (Applicant Role)	9
Prepare An Application Package (Applicant Role)	9
Submit An Application Package (Applicant Role)	9
<i>Test Cases</i>	10
<i>Test Case 1 – Conduct Connectivity Test</i>	10
Test Scenario 1.1 – Perform Connectivity Test – GetApplicationList	10
Test Scenario 1.2 – Perform Connectivity Test – GetApplication	11
<i>Test Case 2 – Retrieve Grant Applications</i>	11
Test Scenario 2.1 – Get List of All Applications	11
Test Scenario 2.2 – Get List of New Applications	12
Test Scenario 2.3 – Get Application	13
Test Scenario 2.4 – Confirm Application Delivery	13
<i>Test Case 3 – Assign Agency Tracking Number</i>	14
Test Scenario 3.1 – Assign Agency Tacking Number to a Retrieved Application	14
<i>Next Steps</i>	14
<i>Acronyms</i>	15

List of Tables

Table 1. Test Steps and Schedule.....	7
Table 2. Test Roles and Responsibilities	8

Record of Changes

Version Number	Date of Change	Made By	Description of Change
1.0	9/22/2003	Ray Kalantar	Draft
1.0	9/22/2003	Yvonne Duncan	Formatting
1.0	9/29/2003	Ray Kalantar	Roles, Testing schedule, etc.
1.0	9/30/2003	Yvonne Duncan	Formatting
1.1	10/7/2003	Ray Kalantar	Incorporated PMO's comments.
1.5	10/8/2003	Yvonne Duncan	Incorporated comments/Formatting

Overview

This document defines the test plan between Grants.gov and agencies that want to use the system-to-system interface to retrieve applications submitted for funding opportunities at their agency. The procedures and steps included within this document define an application-level test of the system in a production-like environment.

It is assumed that the Agency has reviewed the integration resources that have been provided at http://www.grants.gov/pmo_ITIntegration.html. Additionally, it is assumed that the Agency has installed and tested, on an Agency test server, the Web Services Reference Implementation application that is provided as part of the integration resources.

Objectives

The main objective of this document is to provide a “road map” to agency personnel on how system-to-system integration with the Grants.gov will be performed, conduct a string of system-to-system tests using web services, and to clarify the expectations of the individuals who will be participating in the testing process. Finally, this document outlines a test schedule so that the allotted test time can be utilized efficiently.

The sections of the document are defined as follows:

Section 1 – Overview

Section 2 – Preliminary Steps in Preparing to Integrate with Grants.gov

Section 3 – Testing Process

Section 4 – Create Test Data

Section 5 – Test Cases

Section 6 – Next Steps

Section 7 – Acronyms

Preliminary Steps in Preparing to Integrate with Grants.gov

The steps outlined below propose an iterative approach to an Agency’s system-to-system integration with Grants.gov. An Agency should complete the following steps prior to the start of system-to-system integration testing with Grants.gov.

1. Analyze/understand the Agency Integration Web Services Description Language (WSDL) document – posted on www.grants.gov - which describes the following five (5) operations:
 1. GetApplicationList
 2. GetApplication
 3. ConfirmApplicationDelivery
 4. AssignAgencyTrackingNumber

5. NotifyApplicationAvailable
2. Design, develop, and implement the SOAP *Client* Web Service components for at least the following four (4) operations defined in the WSDL document:
 1. GetApplicationList
 2. GetApplication
 3. ConfirmApplicationDelivery
 4. AssignAgencyTrackingNumber

The development of the components outlined above need not take into account security considerations such as the use of HTTPS and server certificate(s) at this time. Security concerns will be addressed later in the integration process.

3. The design, development, and implementation of the SOAP *Server* Web Services component for the *NotifyApplicationAvailable* operation are defined in the WSDL document. An agency will perform this step only if it plans for the Grants.gov system to notify its Agency system that applications are available to be downloaded.

Again, the development of the *NotifyApplicationAvailable* component need not take into account security considerations such as the use of HTTPS and server certificate(s) at this time. Security concerns will be addressed in a later step in the integration process. The system-to-system interaction for this operation will be initiated by the Grants.gov system. The *NotifyApplicationAvailable* function will not be available for the October 2003 launch of Grants.gov.

4. Test the Web Services components against the Phase II Web Services Reference Implementation (available on <http://www.grants.gov/>), which provides both client- and server-side (sending and receiving) implementations of the five (5) Web Service operations defined in the WSDL.

Note: In order to facilitate development, the Reference Implementation purposely does not address Security concerns. Also, it uses three non-Agency specific sample XML documents.

Note: The system-to-system interaction for operation 1-4 will be initiated by the Agency system.

Finally, in preparation for the “official” integration testing with Grants.gov, a server certificate must be obtained from a Certificate Authority (CA) such as VeriSign or Entrust. This certificate will be used not only to secure the message exchanges between the Grants.gov system and the Agency system, but also to identify the Agency system and to determine what data the Agency system can access.

Testing Process

This section describes the testing steps, planned schedule and participants from both the Agency and Systems Integration personnel.

The following table describes the steps that will be taken during testing with an Agency system and the planned test duration. The Test scenarios referred to in the table below are described in **Section 5**.

Table 1. Test Steps and Schedule

Step	Description	When	Participants
1.	Conduct kick off meeting: <ul style="list-style-type: none"> Review system-to-system test plan Review Agency system environment Review Grants.gov test environment Discuss digital certificate authentication Designate Agency and SI POC Provide Agency with test DUNS # Discuss expected test results and review process 	Day 1	Agency IT & SI
2.	Perform Test Scenarios 1.1 – 1.2 - without using Digital Certificate - to verify connectivity of your system with Grants.gov using web services	Day 2	Agency IT & Grants.gov
3.	Install a digital certificate and perform the steps in Section 4: “ Download & Submit Applications ” in order to set-up test data to exchange with Grants.gov	Day 2	Agency IT & Grants.gov
4.	<ul style="list-style-type: none"> Perform Test Scenarios 2.1 – 2.4; to test the <i>GetApplicationList</i>, <i>GetApplication</i> and <i>ConfirmApplicationDelivery</i> functions Document results 	Day 3	Agency IT
5.	Provide feedback to Grants.gov	Day 3 – PM	Agency IT & Grants.gov
6.	<ul style="list-style-type: none"> Perform Test Scenario 3.1; <i>AssignAgencyTrackingNumber</i> function Document results 	Day 4	Agency IT
7.	Perform retesting of scenarios as needed	Day 4	Agency IT
8.	Provide feedback to Grants.gov	Day 4 - PM	Agency IT and Grants.gov
9.	<ul style="list-style-type: none"> Submit additional applications and perform Test Scenarios 2.1 – 2.4 for a complete a start-to-finish test Document Results 	Day 5	Agency IT & Grants.gov
10.	Perform retesting of scenarios as needed	Day 5	Agency IT
11.	Provide feedback to Grants.gov	Day 5	Agency IT
12.	Conclude testing	Day 5 - PM	Agency IT

Test Roles and Responsibilities

The table below describes the roles and responsibilities of the testing Agency and Grants.gov personnel.

Table 2. Test Roles and Responsibilities

Responsibility	Targeted Completion Date	Agency	Grants.gov
Complete all Preliminary Testing Steps (Section 2)	Before Kick-off Meeting	√	
Provide information on Grants.gov test environment	At Kick-off Meeting		√
Provide POC during testing	At Kick-off Meeting	√	√
Use latest Grants.gov Core Schemas, Attachment and WSDL	Before Kick-off Meeting	√	
Provide system support during testing period	Days 1-5		√
Provide Test AOR and DUNS #	Day 1		√
Perform Test Scenarios, provide feedback and discuss test results	Days 1-5	√	√
Correct system test issues and provide updates	Days 1-5		√
Install Client Digital Certificate	Day 2	√	
Provide copy of the digital certificate to SI for inclusion in Agency Profile	Day 2	√	
Submit three or more grant application packages including attachments to Grants.gov	Day 2	√	

Create Test Data

This section describes how to create and publish a funding opportunity (an Agency role), the steps for an applicant to register (Applicant role), download and submit the application (Applicant role) that will be retrieved during testing. In completing this step, a complete, documented grant applications test dataset can be transmitted and verified using the System-to-System interfaces.

Create and Publish a Funding Opportunity (Agency Role)

1. As an agency user, log in to the Grants.gov For Grantors home page.
2. Create and publish a funding opportunity based on the forms to be included for testing. **Note:** *If you need guidance in performing the steps above, please refer to the Grants.gov online tutorial for additional information.*

Applicant Registration (Applicant Role)

1. At the Grants.gov home page, select the Get Started option from the top menu navigation bar.
2. **Select** the Register with Credential Provider option from the left menu navigation bar.
3. Enter a username and password on the registration screen and **Select** the Register button.
4. The registration success page is displayed and then **Select** the Home button to return to the Grants.gov home page.
5. **Select** the Get Started option again from the top menu navigation bar.
6. **Select** Register with Grants.gov option from the left menu navigation bar.
7. Enter the same userid and password as above.
8. The Authorized Organization Representative User Profile screen is displayed.
9. Enter the information requested on the form and the DUNS number provided by Grants.gov
10. The registration success page is displayed. **Select** the Home button to return to the home page.

Download An Application Package (Applicant Role)

1. **Select** the Download Application Package option from the left menu navigation bar and the Download Application Package screen is displayed.
2. Enter the Funding Opportunity Number of the package created in step 4.1 above.
3. At the Selected Grant Applications for Download screen, **Select** the application and download.

Prepare An Application Package (Applicant Role)

1. Complete the forms contained in the application package using the DUNS number provided by Grants.gov.
2. Attach a file either as a project narrative, budget narrative or other attachment.

Submit An Application Package (Applicant Role)

1. When all required information has been entered on the forms, **Save** the application.
2. The Submit button will become active. **Select** the Submit button.
3. **Select** Yes on the Summary of Application Submission to Grants.gov screen.
4. At the User Logon screen, enter the same username and password as in Step 4.2 above **Applicant Registration**.
5. At the Submission Confirmation screen, either print the screen or record the Grants.gov Tracking Number for verification later in the testing process.

Test Cases

The following provides the test cases for Grant.gov / Agency system-to-system integration testing. Please refer to the Agency Integration Design Specification document for detailed information about each of the functions below. Please note that the following functions (related to the peer-to-peer message model) are not going to be part of the October 2003 launch.

1. NotifyApplicationAvailable.
2. GetApplicationList for applications in “Downloaded” status.
3. GetApplicationList for a given Opportunity ID, CFDA Number, or Agency Tracking Number.

As additional functionalities are added to the web services, the Grant.gov team will test these components with the agencies that are ready at that time, and will communicate the added system capabilities to all agencies in a timely manner.

Grants.gov has designed three (3) test cases to conduct with Agency users. These test cases will cover all functionalities scheduled for the October launch:

- **Test Case 1:** Conduct Connectivity Test (using web services)
- **Test Case 2:** Retrieve Grant Applications Retrieval (all applications, new applications, single application)
- **Test Case 3:** Assign Agency Tracking Number

Test Case 1 – Conduct Connectivity Test

Objective: The purpose of Test Case 1 is to validate proper web services connectivity between the agency and Grants.gov systems. In order to demonstrate this connectivity, the Grants.gov team created (2) test scenarios as described below. These tests are standardized and the result will be the same for all the agencies. A generic user ID will be used to access certain predefined grant applications during this test case.

Test Scenario 1.1 – Perform Connectivity Test – GetApplicationList

Inputs: Agency system to issue a *GetApplicationListRequest* message with FilterType = Status and FilterValue = blank using SOAP client without digital certificate.

Expected Result: Grants.gov system will retrieve a predefined list of applications from its database and sends that list to the agency system via *GetApplicationListResponse* message.

Test Procedure:

1. Invoke your web services client that generates the *GetApplicationListRequest* SOAP message and sends the message to the end point – [HTTP://HostName/AgencyIntegration/GetApplicationList](http://HostName/AgencyIntegration/GetApplicationList)
- Note:* HostName refers to the Grants.gov web services test environment.
2. The Grants.gov web services application will process the request message and will reply in one of two ways:
 - a. With a SOAP message containing a predefined list of applications
 - b. With a SOAP fault message containing known errors

Test Scenario 1.2 – Perform Connectivity Test – GetApplication

Inputs: Agency system to issue a *GetApplicationRequest* message with a Grants.gov Tracking Number without digital certificate.

Expected Results: Grants.gov system will retrieve the requested application and sends that to the agency system via the *GetApplicationResponse* message.

Test Procedure:

1. Using one of the Grants.gov tracking numbers that was returned in Test Scenario 1.1, invoke your web services client that generates the *GetApplicationRequest* SOAP message and sends the message to the end point – [HTTP://HostName/AgencyIntegration/GetApplication](http://HostName/AgencyIntegration/GetApplication)
- Note:* HostName refers to the Grants.gov web services test environment.
2. The Grants.gov web services application will process the request message and will reply in one of two ways:
 - a. With a SOAP message that contains the Grant application as a XML document
 - b. With a SOAP fault message containing known errors

Test Case 2 – Retrieve Grant Applications

Objective: The purpose of this test case is to verify the retrieval of the list of submitted applications and the retrieval of a specified application.

Test Scenario 2.1 – Get List of All Applications

Inputs: Agency has downloaded and submitted several applications. The agency system will issue a *GetApplicationListRequest* message with FilterType = Status and FilterValue = **all** using SOAP client through *SSL* with *digital certificate*.

Expected Results: Grants.gov will retrieve a list of all the submitted applications and sends the list to the agency system via a *GetApplicationListResponse* message. The received list should match the original list of submitted grant application created in the “Create Test Data” step. The received application list should also include the Grants.gov Tracking Numbers assigned to each application.

Test Procedure:

1. Invoke your web services client that generates the *GetApplicationListRequest* SOAP message and sends the message to the end point –
HTTPS://*HostName*/AgencyIntegration/GetApplicationList
Note: HostName refers to the Grants.gov web services test environment.
2. The Grants.gov web services application will process the request message and will reply in one of two ways:
 - a. With a list of **all** the applications that were submitted by the agency
 - b. With a SOAP fault message containing known errors

Test Scenario 2.2 – Get List of New Applications

Inputs: The agency system will issue a *GetApplicationListRequest* message with Type = Status and FilterValue = Pending Download through SOAP client using SSL with *digital certificate*.

Expected Results: Grants.gov will retrieve a list of submitted applications that have not been downloaded and send the list to the agency system via a *GetApplicationListResponse* message. The list should also include the Grants.gov Tracking Number assigned to each application on the list.

Test Procedure:

1. Invoke your web services client that generates the *GetApplicationListRequest* SOAP message and sends the message to the end point –
HTTPS://*HostName*/AgencyIntegration/GetApplicationList
Note: HostName refers to the Grants.gov web services test environment.
2. The Grants.gov web services application will process the request message and will reply in one of two ways:
3. With a list of the **Pending Download** applications that were submitted by the agency
4. With a SOAP fault message containing known errors

Test Scenario 2.3 – Get Application

Input: The agency system will issue a *GetApplicationRequest* message with a Grants.gov Tracking Number using SOAP client through SSL with digital certificate.

Expected Results:

- Grants.gov will retrieve the specified application and send it to the agency system via a *GetApplicationResponse* message.
- The agency should issue a *ConfirmApplicationDeliveryRequest* with a Grants.gov Tracking Number.
- Grants.gov should issue a *ConfirmApplicationDeliveryResponse* message with a Grants.gov Tracking Number and Status=Success or Failure.
- Grants.gov should change the status of the application in the system to “downloaded”.

Test Procedure:

1. Using one of the Grants.gov tracking numbers that was returned in Test Scenario 2.1 or 2.2, invoke your web services client that generates the *GetApplicationRequest* SOAP message and sends the message to the end point – `HTTPS://HostName/AgencyIntegration/GetApplication`
Note: HostName refers to the Grants.gov web services test environment.
2. The Grants.gov web services application will process the request message and will reply in one of two ways:
 - a. With the specific application identified by the Grants.gov Tracking Number included in the *GetApplicationRequest* message
 - b. With a SOAP fault message containing known errors

Test Scenario 2.4 – Confirm Application Delivery

Inputs: The agency system will issue a *ConfirmApplicationDeliveryRequest* message with the Grants.gov Tracking Number of the retrieved application.

Expected Results: The Grants.gov system will send a SOAP message confirming Application delivery.

Test Procedure:

1. Invoke your web services client that generates the *ConfirmApplicationDeliveryRequest* SOAP message and sends the message to the end point – `HTTPS://HostName/AgencyIntegration/ConfirmApplicationDelivery`
Note: HostName refers to the Grants.gov web services test environment.
2. The Grants.gov web services application will process the request message and will reply in one of two ways:
 - a. “Success” status and a Grants.gov Tracking Number

- b. With a SOAP fault message containing known errors

Test Case 3 – Assign Agency Tracking Number

Objective: The purpose of this test is for the agency to assign their grant application tracking numbers to the previously retrieved applications and inform Grants.gov.

Test Scenario 3.1 – Assign Agency Tacking Number to a Retrieved Application

Inputs: The agency system will issue an *AssignAgencyTrackingNumberRequest* message with a Grants.gov Tracking Number and Agency Tracking Number.

Expected Results: The Grants.gov system will issue an *AssignAgencyTrackingNumberResponse*.

Test Procedure:

1. Invoke your web services client that generates the *AssignAgencyTrackingNumberRequest* SOAP message and sends the message to the end point –
HTTP://**HostName**/AgencyIntegration/AssignAgencyTackingNumber
Note: HostName refers to the Grants.gov web services test environment.
2. The Grants.gov web services application will process the request message and will reply in one of two ways:
 - a. With a Grants.gov Tracking Number and Agency Tracking Number
 - b. With a SOAP fault message containing known errors

Next Steps

After an agency has completed the five (5) days testing, they should begin planning for moving their web services application into production. The agencies should take the following steps to integrate with the Grants.gov production system:

- Acquire a client digital certificate from a Certification Authority and forward a copy to Grants.gov.
- Register system certificate for the organization/agency with Grants.gov and publish grant opportunities for that organization/agency.
- Select “XML Only” as the Application Download Format in the Manage Agencies set up.
- Modify agency web services application to point to the Grants.gov production environment. The production URLs can be found in the Grants.gov schemas that are posted on Grants.gov web site.

Acronyms

Table 3. Acronyms

Acronym	Definition
CA	Certificate Authority
HTTPS	Hyper Text Transfer Protocol Secure Sockets
IV&V	Independent Validation and Verification
POC	Point of Contact
SI	Systems Integrator
SOAP	Simple Object Access Protocol
SSL	Secure Sockets Layer
WSDL	Web Services Description Language
XML	eXtensible Markup Language