

Exceptional service in the national interest



Sandia National Laboratories Solutions for Aras Innovator



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Agenda

- SharePoint Web Service Integration
 - Why is it needed?
 - What does the user see in the end?
 - Which SharePoint web service(s) are required?
 - How do you implement SharePoint web services?
 - When does the SharePoint service execute?
- Active Directory Sync
 - Why is it needed?
 - What components are used and how do they interact?
 - What does the server-side code do?
 - When does the active directory sync occur?
 - What were the obstacles and solutions?

SharePoint: Why is it needed?

- Customer problem
- Production floor environment
- Engineers need quick access to “gold” copy
 - Paper copies on shop floor



SharePoint Advantages

- Why Integrate with SharePoint?
 - Standard product for many companies (including Sandia)
 - Provides a 2nd repository
 - Familiar interface for external users
 - Common framework (.NET)
- SharePoint web services
 - Can be consumed by Aras
 - Wide variety of operations to utilize
 - Upload documents into SharePoint from Aras vault

Current Aras Solution

The screenshot shows the Aras Innovator web application interface. The browser window title is "Firefox". The application header includes the "aras INNOVATOR" logo, the text "LOCAL TIME Friday, February 28, 2014 3:15 PM", and a menu bar with "File Edit View Search Actions Reports Tools Help". Below the menu bar is a toolbar with various icons. The left sidebar contains a "Contents" menu with the following items: Administration, Solution (expanded), Approval Packages, Aras Training, Documents (expanded), *All Documents*, Mfg Excep - EEN, Mfg Excep - EN, Mfg Excep - PCN, Mfg Excep - SEI, Procedures, Reports, Work Instructions, My Desktop, My InBasket, and Workspaces. The "Documents" sub-menu is highlighted with a red rounded rectangle. The main content area is currently empty. The status bar at the bottom shows "Ready", "Innovator Admin", and "Messages: 0".

Current SharePoint Solution

SharePoint

BROWSE FILES LIBRARY



ARAS

ARAS Service Request System

EDIT LINKS

ARAS Documents ⓘ

ARAS Documents

Recent

Useful Links

EDIT LINKS

ARAS Documents

Document Type

- Change Review
- Engineering Notice
- Experimental Engineering Notice
- Procedure
- Process Change Notice
- Product Requirements Map
- Report
- Special Engineering Instruction
- Work Instruction

+ new document or drag files here

All Documents

Find a file

✓	📄	Name	Document Type	Revision	Document Title	Owner	Release Date
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Doc Type : Change Review (2)

Doc Type : Engineering Notice (259)

Doc Type : Experimental Engineering Notice (1320)

Doc Type : Procedure (945)

Doc Type : Process Change Notice (532)

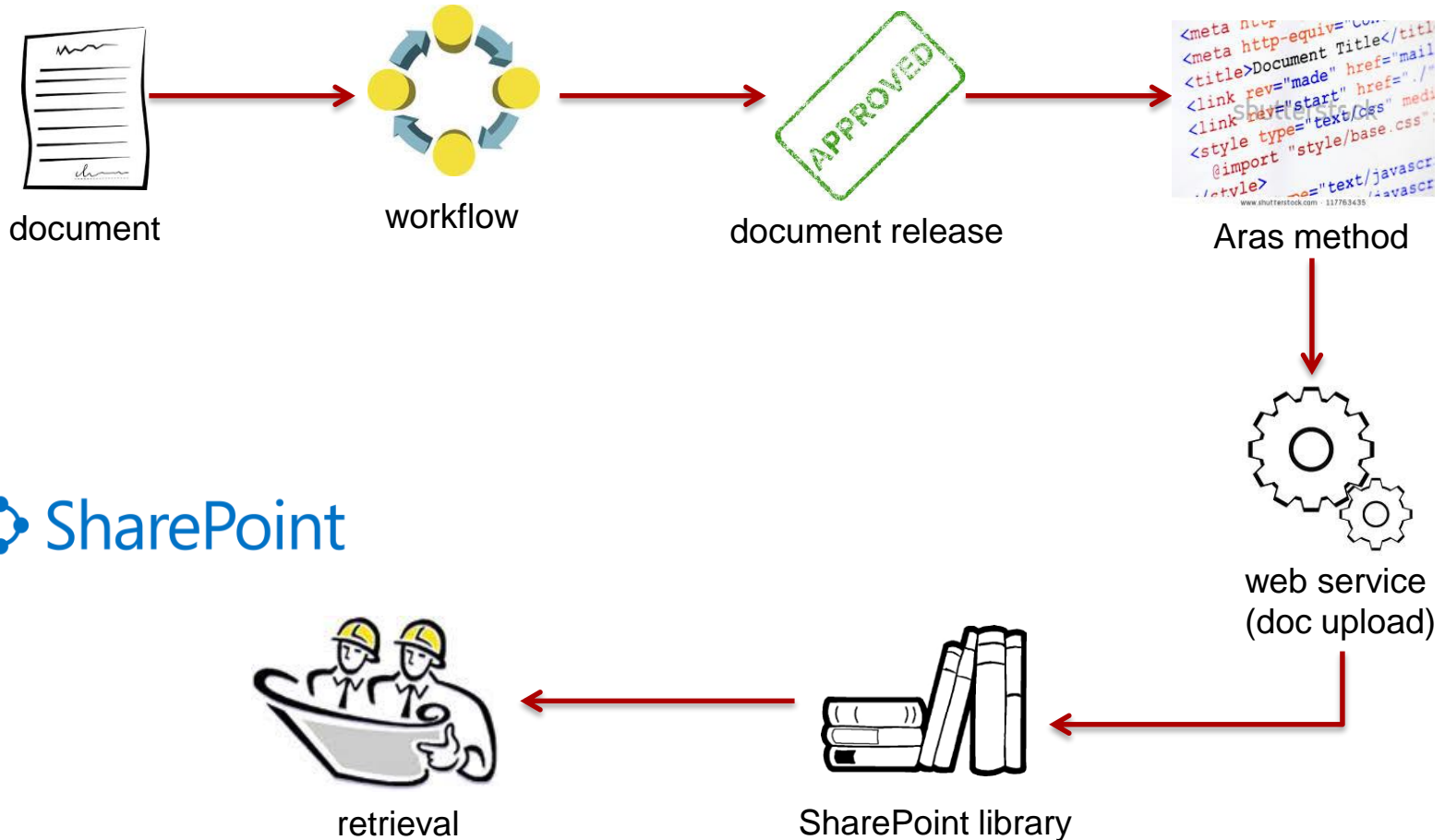
Doc Type : Report (698)

Doc Type : Special Engineering Instruction (159)

Doc Type : Work Instruction (1577)

The Big Picture

aras
INNOVATOR[®]



 **SharePoint**

General Setup

- 1) Web proxy creation
- 2) Create server method in Aras
- 3) Associate method in workflow
- 4) (optional) Set up managed metadata in SharePoint
 - This gives the look and feel of a Saved Search section in Aras

Web Service to Web Proxy

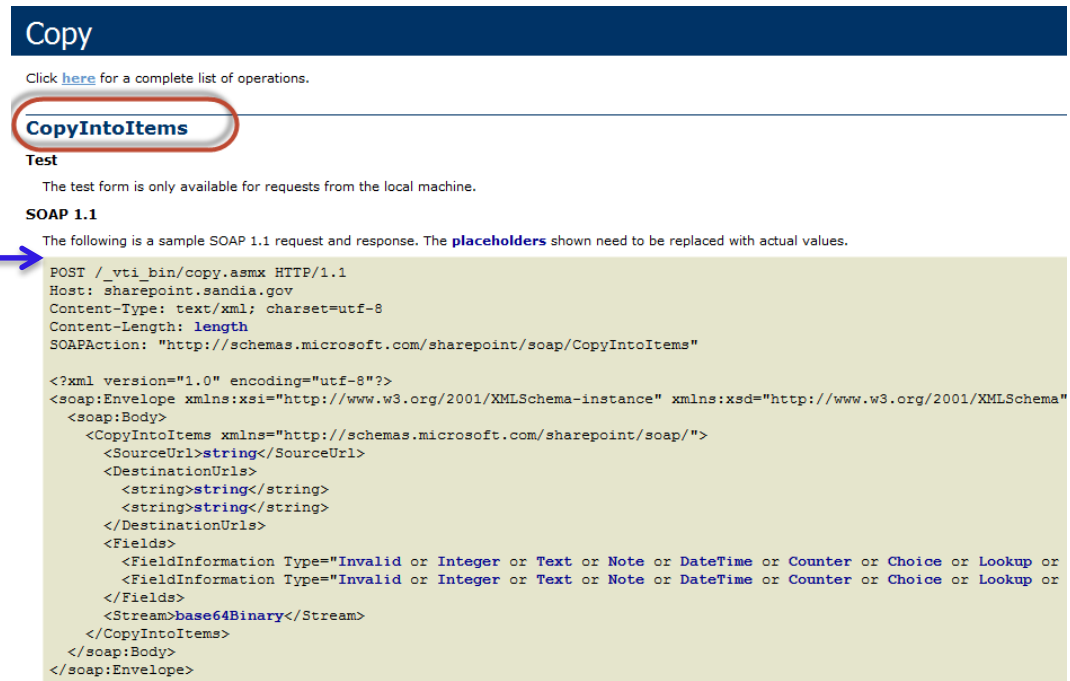
- First, we need to define a web service:
 - A software function provided at a network address (SharePoint server) that is activated by client requests (ie. SOAP: HTTP + XML serialization)
- SharePoint's OOTB services
 - Part of suite of web services that come in SP Server add-on WSS 3.0
 - “Copy” web service includes the following operations:
 - **CopyIntoltems**
 - The operation that copies a file from a source (Aras vault) to the server hosting the web service (SharePoint)
 - “Lists” web service also includes helpful operations
 - **UpdateListItems**
- Goal: consume CopyIntoltems in a server method

Web Service to Web Proxy (cont.)

http://<your-sharepoint-site>/_vti_bin/copy.asmx?op=CopyIntoItems

SharePoint server waiting for an XML request in this format...

...sent from the Aras server via a method.



Copy

Click [here](#) for a complete list of operations.

CopyIntoItems

Test

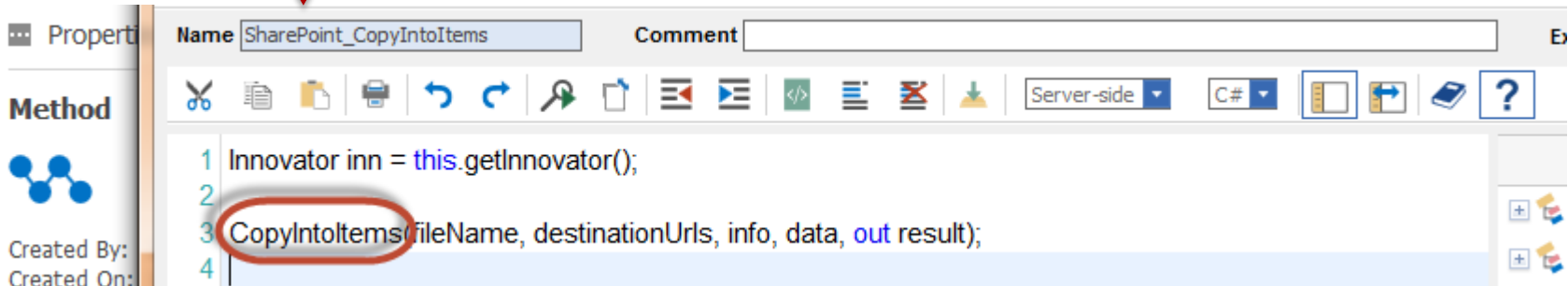
The test form is only available for requests from the local machine.

SOAP 1.1

The following is a sample SOAP 1.1 request and response. The **placeholders** shown need to be replaced with actual values.

```
POST /_vti_bin/copy.asmx HTTP/1.1
Host: sharepoint.sandia.gov
Content-Type: text/xml; charset=utf-8
Content-Length: length
SOAPAction: "http://schemas.microsoft.com/sharepoint/soap/CopyIntoItems"

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  <soap:Body>
    <CopyIntoItems xmlns="http://schemas.microsoft.com/sharepoint/soap/">
      <SourceUrl>string</SourceUrl>
      <DestinationUrls>
        <string>string</string>
        <string>string</string>
      </DestinationUrls>
      <Fields>
        <FieldInformation Type="Invalid or Integer or Text or Note or DateTime or Counter or Choice or Lookup or
        <FieldInformation Type="Invalid or Integer or Text or Note or DateTime or Counter or Choice or Lookup or
      </Fields>
      <Stream>base64Binary</Stream>
    </CopyIntoItems>
  </soap:Body>
</soap:Envelope>
```



Property

Name SharePoint_CopyIntoItems

Comment

Method

```
1 Innovator inn = this.getInnovator();
2
3 CopyIntoltems(fileName, destinationUrls, info, data, out result);
4
```

1) Web Proxy Creation

- Web service proxy
 - A basic object used in the invocation of a web service
 - Function that takes parameters and handles message transmission
- Generated in two steps:
 - Microsoft's wsdl.exe utility that generates a source code file (C#) based off of the web service's WSDL (web service definition language)
 - Microsoft's csc.exe utility that compiles the code into a proxy (DLL)
 - Register the proxy in Innovator
 - Add new DLL reference to method-config.xml in /innovator/server/bin
 - Now you can call web service function ('CopyIntoItems') in Aras method
 - Aras document: *"How-To Consume a Web Service in a Server Method"*

2) Create Server Method

- `SP_Copy.Copy copyService = new SP_Copy.Copy();`
 - `copyService.CopyIntoItems()`

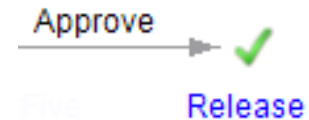
```
public uint CopyIntoItems(string SourceUrl, string[]
DestinationUrls, FieldInformation[] Fields, byte[] Stream,
out CopyResult[] Results)
```
 - `SP_Copy` represents the DLL created from `wddl.exe`
 - Some parameter help:
 - `byte[] Stream`
 - `byte[] data = File.ReadAllBytes(file);`
 - <http://www.aras.com/Community/forums/t/1216.aspx> to see how to retrieve file
 - `FieldInformation[] Fields` – *these will copy to the SharePoint fields/columns*
 - `SP_Copy.FieldInformation i0 = new SP_Copy.FieldInformation {
 DisplayName = "Doc Type", Type = SP_Copy.FieldType.Text,
 Value = doc.getProperty("classification") };`
 - `SP_Copy.FieldInformation[] info = { i0, i1 };`

2) Create Server Method (cont.)

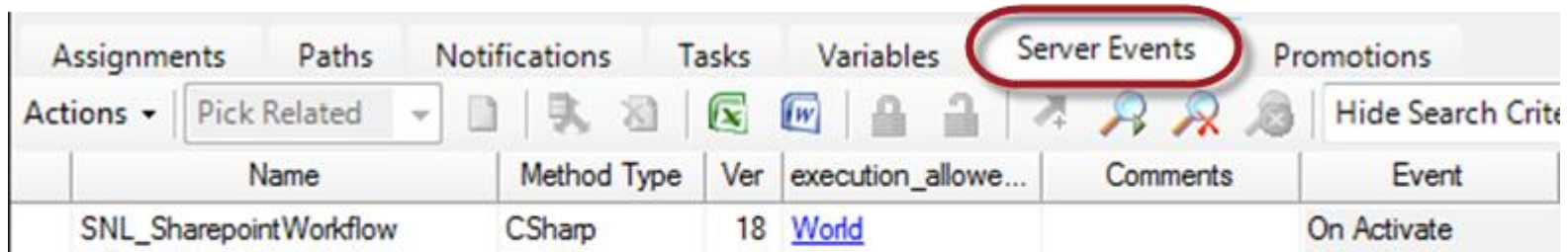
- `SP_Lists.Lists listService = new SP_Lists.Lists();`
- `listService.UpdateListItems()`
 - Only used for managed metadata (optional)
 - `public XmlNode UpdateListItems (string listName, XmlNode updates)`
 - `updates.InnerXml = "<Method ID='1' Cmd='Update'><Field Name='ID'>" + fileID + "</Field><Field Name='Document_x0020_Type'>" + metadata + "</Field></Method>";`
 - `metadata = "2;#Report|f7a1dc29-6d08-472f-bc22-2ce79a7fee6e";`
 - (see Obstacles/Solutions slide for more info.)
 - `fileID` = SharePoint's unique document ID
 - To get ID, traverse XML returned by `GetListItems` (attribute "ows_ID" holds file ID)
 - `listService.GetListItems()` – 7 parameters
 - Key parameters are `listName` (library name) and XML query (example below)
 - `batchElement1.InnerXml = "<Where><Eq><FieldRef Name=\"FileLeafRef\" />" + "<Value Type=\"Text\">" + fileName + "</Value></Eq></Where>";`

3) Associate Method in Workflow

- 'Release' activity triggered method



- Publishes document to SharePoint on 'end' activity of workflow




Name	Method Type	Ver	execution_allow...	Comments	Event
SNL_SharepointWorkflow	CSharp	18	World		On Activate

- In the method:

- Have to retrieve the documents controlled by the workflow

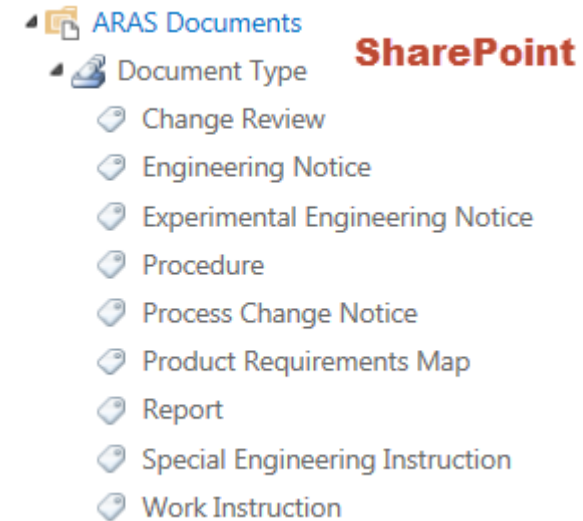
4) Set Up Managed Metadata

- SharePoint's Managed Metadata (MM)
 - Optional feature
 - User defined hierarchical collection of terms
 - Can be used as attributes
 - Create "saved searches" based off of the MM
- UpdateListItems
 - Operation defined in 'Lists' web service
 - Updates MM values
 - CopyIntoItems only updates fields (below)

✓  **Name** **Document Type** **Revision** **Document Title** **Owner** **Release Date**

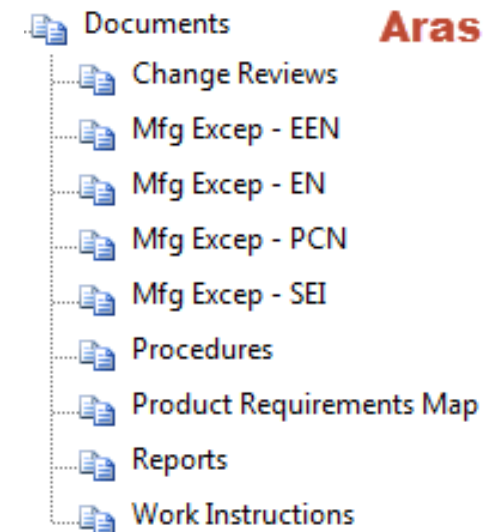
▸ Doc Type : **Change Review** (2)

▸ Doc Type : **Engineering Notice** (259)



SharePoint

- ARAS Documents
 - Document Type
 - Change Review
 - Engineering Notice
 - Experimental Engineering Notice
 - Procedure
 - Process Change Notice
 - Product Requirements Map
 - Report
 - Special Engineering Instruction
 - Work Instruction



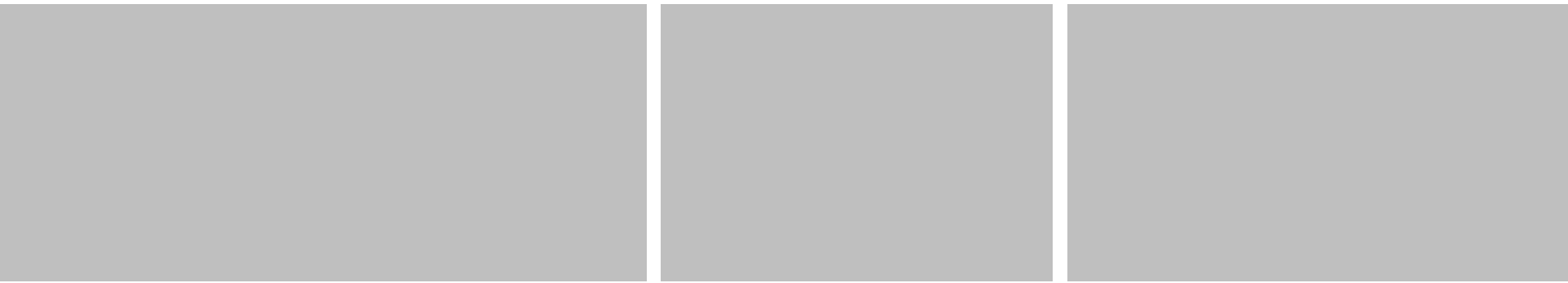
Aras

- Documents
 - Change Reviews
 - Mfg Excep - EEN
 - Mfg Excep - EN
 - Mfg Excep - PCN
 - Mfg Excep - SEI
 - Procedures
 - Product Requirements Map
 - Reports
 - Work Instructions

Obstacles/Solutions

- Managed Metadata (MM)
 - Configuring the metadata format
 - `<WssId>;#<TermValue>|<TermGuid>`
`metadata = "1;#Procedure|a9942160-02bf-475f-9aa3-65020aa4cb7a";`
 - Retrieved WssId value for each metadata (document type) by:
 - 1) create dummy document in SharePoint library for each metadata value
 - 2) export library to Excel (Doc. Type column showed “1;#Procedure”, etc.)
 - Wouldn’t be surprised if there was a better way to do this!
 - Retrieved TermGuid by going to:
 - `<Site URL>/Lists/TaxonomyHiddenList/AllItems.aspx`
 - A default value in SharePoint for MM was needed
 - Otherwise the MM was not copied from Aras method
 - Not entirely sure why
 - Change the default value (after document upload via CopyIntoItems) to the document’s real value (via UpdateListItem)

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Thank You



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