Implementation Guide

THE SYNTHESIS
ENTERPRISE PORTAL
Version 10

ReliaSoft®

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Synthesis Enterprise Portal Implementation Guide
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ReliaSoft Corporation
Worldwide Headquarters
1450 South Eastside Loop
Tucson, Arizona 85710-6703, USA
Tel: 1-520-886-0410   Fax: 1-520-886-0399
Sales and Information: 1-888-886-0410 (Toll-free in the U.S. and Canada)
ReliaSoft@ReliaSoft.com   http://www.ReliaSoft.com

Synthesis Enterprise Portal Implementation Guide

This document provides instructions to implement a Synthesis Enterprise Portal (SEP) website for your organization.

1.1 SEP System Architecture

The SEP is a web-based system that serves the needs of engineering teams of any size. The system is based on the .NET Framework and is designed to be n-tier, scalable, distributable, robust and able to be deployed across multiple servers or on a single computer.

Server Requirements

If you plan to host the database and website on the same server, you will need:

Windows 2008 R2 or newer

.NET 4.0

IIS with support for serving ASP.NET

SQL Server 2005 or newer OR Oracle 10g or newer (32-bit and 64-bit versions of all, full version only)

Client Requirements

Once the website has been implemented, users can access it with any web browser that supports the following doctype.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

This includes Internet Explorer, Chrome, Firefox or Safari residing on a Windows operating system, a Mac operating system or even a tablet (such as iOS, Android, etc.).[1] *Note that there are known issues with some versions of the Apple iOS for web applications that use Windows Authentication. If you experience issues with Safari on an iPhone or iPad, you may need to use Safari's "Private" mode, update the iOS version or use a different web browser.*

These are the same requirements as ReliaSoft's XFRACAS failure reporting, analysis and corrective action system. Both systems can be deployed together for the most comprehensive enterprise reliability solution available.
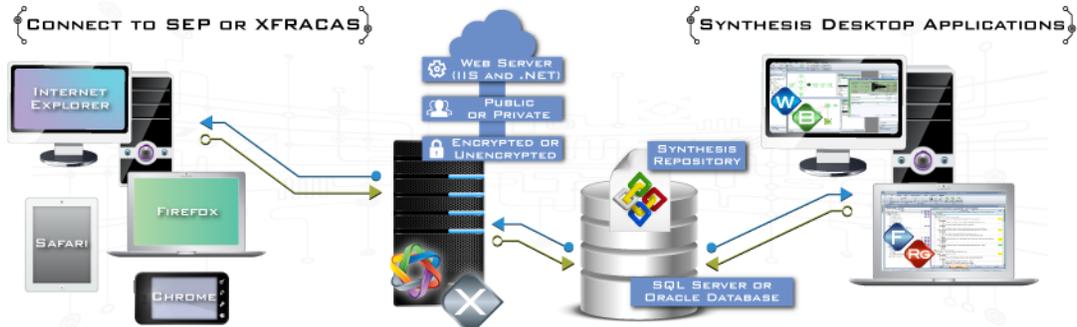
1.2 Prepare the Database - SQL Server or Oracle

ReliaSoft's Synthesis desktop applications (e.g., Weibull++, Xfmea, etc.), XFRACAS and the Synthesis Enterprise Portal (SEP) are all designed to connect with the same data repository on either SQL Server or Oracle.

If you need to establish a new Synthesis enterprise repository, the following considerations apply for preparing the database server. **If you already have a Synthesis enterprise repository established, you can skip this section.**

Later, you will use the admin tool to either create the database or connect the website to an existing database. (See Section 1.5 on page 7.)

[1.] If the site is private (e.g., http://InternalServer/SEP), the system administrator may need to provide users with instructions for how to access the website on the internal network from their mobile devices (e.g., via VPN or some other method).

If you are setting up for SQL Server:

- Make sure you have the latest version of SQL Server running. To do this, run the following query in Query Analyzer: "Select @@version". This should return a value like "Microsoft SQL Server 2005 - 9.00.3042 (Intel X86)" or "Microsoft SQL Server 2008 R2 - 10.50.1617 (X64)," depending upon which SQL Server service pack you have installed.

- Make sure you know the SQL Server Name. This is a local server name or IP address so the IIS machine with the .NET application can connect to the database. These instructions assume that you will use a default instance of SQL Server to host the Synthesis repository (e.g., SERVERNAME). If not, you will need to specify the instance when you enter the server name (e.g., SERVERNAME\INSTANCENAME).

If you are setting up for Oracle:

- For easier support, the SQL Worksheet or Oracle SQL Developer should be installed. The SQL Worksheet is installed with the Enterprise edition of the Oracle installation. The Oracle SQL Developer and its installation guide can be downloaded from the Oracle website.

In either database type, you must make sure that your account has permissions to create a database on the server. Typically, this is a system admin account in the database platform. For SQL Server, the Synthesis Admin tool will use the account that is logged in to perform the installation. For Oracle, it will use the "Admin Information" that you enter when required.

1.3 Prepare the Web Server - IIS

To prepare the web server prior to installing the SEP application, the following considerations apply:

You will need to install the IIS role. *The following instructions are for IIS on Windows 2008. The interface will be different for Windows 2012.*

1. Open the Server Manager (available in the Administrative Tools list).
2. In the **Roles Summary** area, click the **Add Roles** link on the right side of the window.
3. In the Add Roles Wizard, click **Server Roles** in the navigation area. Then, on the right side of the window, select the **Web Server (IIS)** check box and click **Install**. Make sure that the following services are installed for the role:
    a. Under Web Server:
        - Common HTTP Features
            ○ Static Content
            ○ Default Document

- ○ Directory Browsing
- ○ HTTP Errors
- Application Development
  - ○ ASP.NET
  - ○ ASPX
  - ○ ISAPI Extensions
  - ○ Server Side Includes
- Health and Diagnostics
  - ○ HTTP Logging
  - ○ Logging Tools
  - ○ Request Monitor
  - ○ Custom Logging
- Security
  - ○ Windows Authentication
  - ○ Request Filtering
  - ○ IP and Domain Restrictions
- Performance
  - ○ Static Content Compression
  - ○ Dynamic Content Compression

b. Under Management Tools:

- IIS Management Console

1.4 Install the Website and Connect to a Synthesis Repository

Once you have prepared the database and web server(s), a system administrator will need to perform the following steps on the web server in the order specified.

User Account Control (UAC) can either be left on or turned off for this installation.

1. Run the Synthesis Enterprise Portal setup (e.g., SEP**10_1.exe**) and follow the steps in the wizard to create the website and install the activation and admin tools.

2. Run the Product Activation tool and follow the steps to activate your license. From **Start**, it is located at **ReliaSoft\Synthesis Enterprise Portal 10\Product Activation**.

   Note that you will need to run this as an administrator or allow it to be elevated to administrator. For activation, the new license will follow Synthesis license protocol and will be registered to a

specific e-mail address. This e-mail address will receive notification of the product license key that will be required to activate the license. Note that if the hardware changes for any reason, this will change the underlying Machine PIN that is used in encoding the license, and the license will need to be reactivated to work. Therefore, from a support standpoint, the e-mail address used should be one that someone who changes the hardware would have access to, in order to get the system back up and running. This will be the same account for all stages of license usage from development/staging to production.

3. Run the Synthesis Admin tool. From **Start**, it is located at **ReliaSoft\Synthesis Enterprise Portal 10\Synthesis Admin**. You will also need to run this as an administrator or allow it to be elevated to administrator. This tool contains utilities for both XFRACAS and the Synthesis Enterprise Portal. For the SEP:

   a. If you need to create or upgrade a Synthesis enterprise repository, use one of the first three buttons and follow the steps.

   b. Click the **Update SEP Configuration File** button. On the Connections tab of the window:

   - **Connection Info** - If you used the admin utility to create or upgrade an enterprise repository, the database connection info will have been entered automatically. If you want to use an existing repository (e.g., a database already created via a Synthesis desktop application or XFRACAS), enter the connection info now.

     Select **Encrypt Connection String** if you want to hide the connection string information within the web configuration file.

   - **Impersonate User** - Enter the credentials that the SEP website will use to connect to the Synthesis repository.

     For a SQL Server database using Trusted Authentication:

     o If the application is running on the same machine as SQL Server, the account you use can be either local or an Active Directory account.

     o If the application is running on a different machine from SQL Server, the account must be an Active Directory account.

        You will need to add the account as a User in SQL Server, assign it a public server role and give it the following database roles: db_datareader, db_datawriter, db_ddladmin, db_securityadmin.

     For an Oracle database, the website will connect to the database by supplying a username and password directly to the database, rather than via Windows authentication. Enter the schema and password used when you created the database account.

     Select **Encrypt Impersonation Identity** if you want to hide the username and password within the web configuration file.

On the Settings tab of the window:

- **Request Timeout** sets how long IIS waits for a request to the application to finish processing. Typically, this will not need to be changed, but if you are importing large XML files into the system and they time out during import, you can extend this to a larger value.

c. If the administrator(s) in the Synthesis repository (i.e., the user(s) who need to manage user accounts for Synthesis desktop applications or the SEP) will be different than the user who created the database, click the **Manage Synthesis Users** button and follow the steps to create the necessary admin account(s).[2] Later, the admin users will be able to create and maintain accounts from within the Synthesis desktop applications. (*See Section 1.8 on page 16*.)

Note that for access to XFRACAS, individual user accounts are created and maintained separately via the web-based administrative interface.

1.5 Post-Installation Steps in the IIS Manager

After installation, there are additional settings that you can specify in the IIS Manager.

- If .NET 4.0 was pre-existing on the IIS server (i.e., if it was already installed and not installed via the SEP installation), you may encounter a server error the first time you attempt to access the system. If this happens, you will need to give full permissions for the .NET temporary folder (C:\Windows\Microsoft.NET\Framework\v4.0.30319\Temporary ASP.Net Files\) to the account that the application is running as (specified in the SEP configuration file). You may need to take ownership of this folder before you are able to do this.

- For large systems or systems with a high transactional load, an "Out of Memory" error can occur when the request for pages exceeds the system's capability to release and recycle the memory with the default IIS settings. The settings provided below will force IIS to recycle the memory usage and handle the memory usage better so that the "Out of Memory" error does not occur. Note that being too aggressive with regard to how memory is recycled can slow down the response of the system. Typically, memory is recycled when the application pool and the server are not busy. Forcing memory recycling to happen more often can take up processor cycle time when the application is still busy, thus slowing down system performance. The following settings have been tested to prevent the error occurring while making the minimum possible impact on

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[2.] For SQL Server, you will also need to make sure that Synthesis user accounts will be recognized by SQL Server (using SQL Server logins or Windows impersonation). For details, consult the desktop application help files (e.g., http://help.synthesisplatform.net/weibull_alta10/sql_server_logins_or_using_impersonation.htm).

performance. *(These instructions are for IIS on Windows 2008. The interface will be different for Windows 2012.)*

1. In the Connections pane, click **Application Pools**.

2. Right-click the system's application pool and choose **Recycling** on the shortcut menu.

3. In the Application Pool Recycling Settings window that appears, specify the following settings:

    a. In the Fixed Intervals area, select **Regular time intervals** and enter **1740**.

    b. In the Memory Based Maximums area, select **Private memory usage** and enter **1,024,000**.

    c. Click **Next**.

    d. Select to log the following events:

        ○ **Regular time intervals**

        ○ **Private memory usage**

        ○ **Unhealthy ISAPI**

● In the Configuration Editor, you should specify the maximum file sizes that can be uploaded/ downloaded.

1. In the **Section** drop-down list, choose **system.webServer/asp**.

    ● The **maxRequestEntityAllowed** value sets the maximum file size that can be uploaded to the server. The value is set during installation to 4,194,304, or 4 MB; you can, however, enter another value to suit your needs.

    ● The **bufferingLimit** value sets the size of the buffer that holds the response sent back to the client. The value is set during installation to 4,194,304, or 4 MB; you can, however, enter another value to suit your needs. This value should be changed if you are running very large reports and find that they do not respond.

2. In the **Section** drop-down list, choose **system.webServer/caching**.

    ● The **maxResponseSize** value sets the maximum file size that can be returned to the client. The value is set during installation to 262,144 bytes; you can, however, enter another value to suit your needs.

1.6 Additional IIS Configuration Changes for Enhanced Security

In order to address the Open Web Application Security Project (OWASP) security concerns mentioned below, as well as certain other issues, we recommend taking the steps listed for each. Note that the model web.config code provided in Section 1.7.1 on page 15 summarizes the changes made in the IIS Manager. If you make these changes directly in the web.config file in the root folder for your website, you can skip the steps shown here in italics.

For some of the issues listed here, you will need to install the URL Rewrite tool, available at http://www.iis.net/downloads/microsoft/url-rewrite.

The tasks performed in the IIS Manager should be done at the Default Web Site level (i.e., in the **Connections** pane, open the **Sites** node under the server name and click **Default Web Site**).

ALERT: Web Server Default Welcome Page

1. From the wwwroot directory, remove iisstart.htm, welcome.png and the asp_client folder.

ALERT: Clickjacking: X-Frame-Options Header Missing

1. *In the IIS Manager Home page, double-click **HTTP Response Headers**.*

2. *In the **Actions** area, click **Add**. Enter **X-Frame-Options** as the name, and **SAMEORIGIN** as the value.*

ALERT: OPTIONS Method Is Enabled

1. *In the IIS Manager Home page, double-click **Request Filtering**.*

2. *On the **HTTP Verbs** tab, click **Allow Verb** in the **Actions** area and enter **Options** in the Deny Verb window.*

ALERT: Microsoft IIS Version Disclosure

1. In the following Registry key, create a dWORD entry called DisableServerHeader and set the value to 1:

   HKLM\SYSTEM\CurrentControlSet\Services\HTTP\Parameters

2. In the IIS Manager Home page, double-click **URL Rewrite**.

3. In the **Actions** area, click **View Server Variables**, then click **Add** and enter **RESPONSE_SERVER** in the text box.

4. *Add an outbound rule to rewrite the RESPONSE_SERVER server variable as blank.*

   a. *In the **Actions** area, click **Back to Rules** and then click **Add Rule(s)**.*

   b. *In the Add Rule(s) window, click **Blank rule** in the **Outbound rules** category and click **OK**.*

   c. *Create the outbound rule using the following settings:*

      - *Name: Response Server*
      - *Precondition: None*
      - *Matching scope: Server Variable*
      - *Variable name: RESPONSE_SERVER*
      - *Variable value: Matches the Pattern*
      - *Using: Regular Expressions*

- *Pattern: .+*
- *Action type: Rewrite*
- *Action Properties:*
  - *Value: <leave this field empty>*
  - *Replace existing server variable value: Selected*

ALERT: ASP .NET Version Disclosure

1. In the IIS Manager Home page, double-click **URL Rewrite**.

2. In the **Actions** area, click **View Server Variables**, then click **Add** and enter **RESPONSE_X-ASPNET-VERSION** in the text box.

3. *Add an outbound rule to rewrite the RESPONSE_X-ASPNET-VERSION server variable as blank.*

   a. *In the **Actions** area, click **Back to Rules** and then click **Add Rule(s)**.*

   b. *In the Add Rule(s) window, click **Blank rule** in the **Outbound rules** category and click **OK**.*

   c. *Create the outbound rule using the following settings:*

      - *Name: x-ASPNet*
      - *Precondition: None*
      - *Matching scope: Server Variable*
      - *Variable name: RESPONSE_X-ASPNET-VERSION*
      - *Variable value: Matches the Pattern*
      - *Using: Regular Expressions*
      - *Pattern: .+*
      - *Action type: Rewrite*
      - *Action Properties:*
        - *Value: <leave this field empty>*
        - *Replace existing server variable value: Selected*

Additional: X-Powered-By Header

1. In the IIS Manager Home page, double-click **HTTP Response Headers**.

2. Select the **X-Powered-By** header and click **Remove**.

3. In the IIS Manager Home page, double-click **URL Rewrite**.

4. In the **Actions** area, click **View Server Variables**, then click **Add** and enter **RESPONSE_X-POWERED-BY** in the text box.

5. *Add an outbound rule to rewrite the RESPONSE_X-POWERED-BY server variable as blank.*

   a. *In the **Actions** area, click **Back to Rules** and then click **Add Rule(s)**.*

   b. *In the Add Rule(s) window, click **Blank rule** in the **Outbound rules** category and click **OK**.*

   c. *Create the outbound rule using the following settings:*

      - *Name: X-Powered*

      - *Precondition: None*

      - *Matching scope: Server Variable*

      - *Variable name: RESPONSE_X-POWERED-BY*

      - *Variable value: Matches the Pattern*

      - *Using: Regular Expressions*

      - *Pattern: .+*

      - *Action type: Rewrite*

      - *Action Properties:*

         ○ *Value: <leave this field empty>*

         ○ *Replace existing server variable value: Selected*

Additional: Custom Errors

1. In the IIS Manager, open the Configuration Editor.

2. In the **Section** drop-down list, choose **system.web/customErrors**.

3. Set **Mode** to **RemoteOnly**.

1.6.1 Web.config Changes

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
        <system.web>
                <customErrors mode="RemoteOnly">
                </customErrors>
        </system.web>
  <system.webServer>
    <httpProtocol>
      <customHeaders>
        <remove name="X-Powered-By" />
                <add name="X-Frame-Options" value="SAMEORIGIN" />
      </customHeaders>
    </httpProtocol>
```

```
<security>
  <requestFiltering>
    <verbs>
      <add verb="OPTIONS" allowed="false" />
    </verbs>
  </requestFiltering>
</security>
<rewrite>
  <outboundRules>
    <rule name="Response Server">
      <match serverVariable="RESPONSE_SERVER" pattern=".+" />
      <action type="Rewrite" />
    </rule>
    <rule name="X-Powered">
      <match serverVariable="RESPONSE_X-POWERED-BY" pattern=".+" />
      <action type="Rewrite" />
    </rule>
    <rule name="x-ASPNet">
      <match serverVariable="RESPONSE_X-ASPNET-VERSION" pattern=".+" />
      <action type="Rewrite" />
    </rule>
  </outboundRules>
</rewrite>
</system.webServer>
</configuration>
```

1.7 Set up Synthesis Repository User Accounts and Permissions

Once the Synthesis repository has been created, you can use any of the desktop applications or the Synthesis Admin utility on the web server to create user accounts and set permissions. You must create an account for anyone who will be able to edit or view data in the Synthesis repository, including users who only need to complete assigned actions or view the SEP website. (Note that for access to the XFRACAS website, individual user accounts are created and maintained separately via the web-based administrative interface.)

● In the Synthesis Admin utility on the web server, click the **Manage Synthesis Users** button.

● In the Synthesis desktop applications (e.g., Weibull++, Xfmea, etc.), first open the repository and then choose **File > Manage Repository > Authorized Users**.

If your organization uses Microsoft Active Directory, you can save time by importing user information from the directory to create the user accounts.

For more information, please consult the "Security Options" topics in the desktop application help files (e.g., http://help.SynthesisPlatform.net/weibull_alta10/security_options.htm).

1.8 Assign SEP Access

Once the Synthesis repository user accounts have been created, you can use the SEP website to specify which of the database users will have access to the web portal. Click the **Manage Users** link in the top-right corner of the website and then select which accounts will have SEP access.
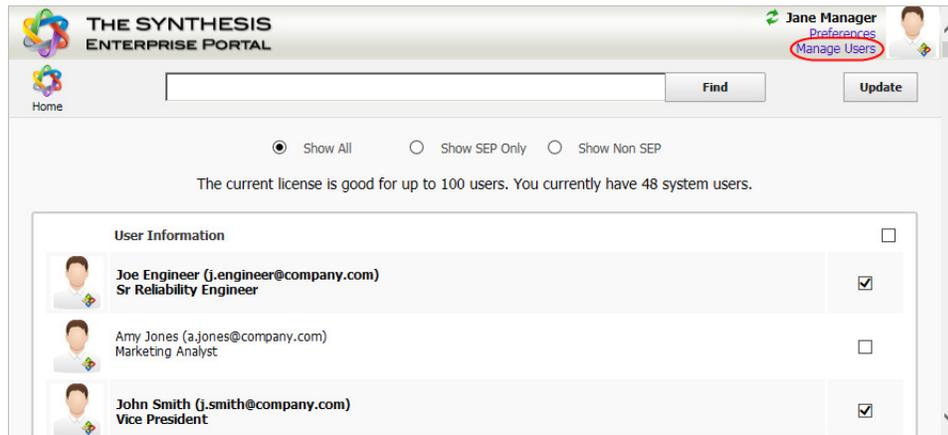
1.9 Enable Publish to Synthesis Enterprise Portal

Some SEP-related features in Synthesis desktop applications (e.g., the ability to publish analysis summaries, workbooks, reports, etc.) will be visible only if the **Enable publish to Synthesis Enterprise Portal** option is set to "Yes" for the database.

This can be set from the **Preferences** page in the website:
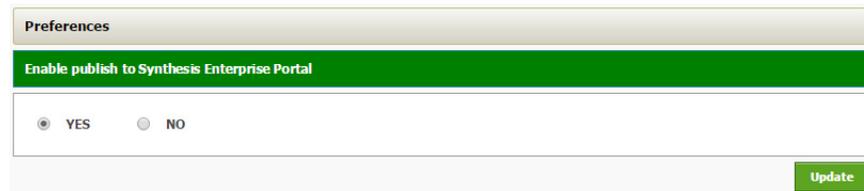
Alternatively, it can also be set from the **E-mail and Other Settings** window in any of the desktop applications: