

Acumatica ERP 2019 R1

ISV Software Certification Guidelines

Software Solution Test
Guidelines

Contents

| | |
|----------------------------------------------------------------------------------|-----------|
| Contents | 2 |
| Program Overview | 3 |
| Testing Process | 5 |
| Documentation Requirements | 7 |
| ISV Software Solution Requirements and Recommendations | 8 |
| Prerequisites..... | 8 |
| Development Requirements..... | 11 |
| User Assistance and Product Documentation Requirements and Recommendations | 28 |
| User Experience Requirements and Recommendations..... | 33 |
| Installation and Setup Requirements and Recommendations..... | 37 |
| Upgrade and Maintenance Requirements..... | 44 |
| ISV Solution Key Functionality Verification Test | 45 |

Program Overview

The Acumatica ISV Software Certification Guidelines describe the technical requirements that an ISV solution must meet to integrate with and operate within the Acumatica ERP application. For information about testing the requirements, see the *How to Comply* and *Test Methodology* sections in the description of each requirement.

The purpose of this testing is to give the market the assurance that an ISV solution built for Acumatica ERP meets technical requirements that adhere to a high standard. The test guidelines will walk you through the test process and help you to make sure that your solution meets the requirements. The test guidelines are designed to increase the quality of solutions that run within the Acumatica ERP environment and address the following goals:

- Assure that the ISV solution meets basic security standards and is secure to use within the Acumatica ERP application
- Verify that the ISV solution does not affect the overall performance of Acumatica ERP
- Provide data consistency within the Acumatica ERP environment
- Guarantee compatibility of the ISV solution with Acumatica ERP
- Verify that the ISV solution has been developed by certified Acumatica developers and contains all necessary product documentation

This document contains the following sections:

- The **Testing Process** section describes how the testing process works, from initial steps through the communication of test results.
- The **Documentation Requirements** section provides a list of the documentation that you must submit with your solution.
- The **ISV Software Solution Requirements and Recommendations** section defines each requirement and recommendation category, the ways these requirements and recommendations are tested, and the things you can do to ensure that your solution meets the requirements.
- The **ISV Solution Key Functionality Verification Test** section defines the structure of the functionality verification tests that you must provide for each key usage scenario for which you have designed your ISV solution.

We welcome your comments and suggestions. Please send an email message with your feedback to [Ruslan Devyatko](#), Technology Programs Enablement Manager at Acumatica.

Supported Product Versions

ISV solutions that are submitted for testing must run on **Acumatica ERP 2019 R1**.

Please note that applications for ISV solution certification on **Acumatica ERP 2019 R1** must be submitted no later than March 1, 2020.

Categories of Solutions

ISV solutions fall into three general categories:

- An ***embedded*** solution is an ISV solution that extends Acumatica ERP by using only the Acumatica xRP framework and the Acumatica Customization tools. An embedded solution must be distributed via a deployment package (a redistributable Acumatica customization package). A partial or entire embedded ISV solution can be exposed via the Acumatica ERP screen-based or contract-based web services API but must never make web service calls to the Acumatica ERP application.
- A ***connected*** solution is an ISV solution that communicates with the Acumatica ERP application only through the Acumatica ERP screen-based or contract-based web services API. A connected solution must not have any redistributable deployment packages and must require zero configuration in the Acumatica ERP environment. Typically, a connected solution refers to a standalone product that interoperates with the core Acumatica ERP application via the web services API.
- A ***composite*** solution is an ISV solution that combines traits of both an embedded solution and a connected solution. If an ISV solution contains a redistributable deployment package and at the same time communicates with the Acumatica ERP application through the Acumatica ERP screen-based or contract-based web services API, it automatically falls into the composite solution category.

Testing Process

To submit a solution to Acumatica for certification, an ISV must be an active Level 2 member of the Acumatica Developer Network and the solution must be registered with Acumatica. To create a certification case, a representative of the ISV must open the Manage ISV Solutions page on Acumatica Partner Portal, upload the latest version of the solution, and then click the **Create Certification Case** button. The representative of the ISV is responsible for attaching the latest version of the solution, along with all required supporting documentation, either to the newly created support case with a class ID of *ISV Solutions Certification* or to a comment created for the support case.

An Acumatica test engineer will perform comprehensive testing on the solution to be sure it meets all certification requirements. Depending on the category of the solution, different test methods apply:

- For an embedded solution, the test engineer will generally perform the following steps:
 - Deploy a local brand-new single-tenant Acumatica ERP instance with the Sales Demo data template.
 - Import all customizations provided by the ISV, and verify **Requirement 1.2**, **Requirement 1.3**, **Requirement 1.4**, and **Requirement 1.5**.
 - Use Acuminator to perform static code analysis tests against the full source code of the extension libraries included in the solution's redistributable deployment package.
 - Configure Acumatica ERP features in accordance with the license requirements of the ISV solution.
 - Publish all customizations provided by the ISV, and set up the solution following the steps from the installation and configuration guide provided by the ISV.
 - Perform runtime validations and run the Validation Tool to verify **Requirement 1.5**, **Requirement 1.6**, and **Requirement 4.3**.
 - Validate user experience requirements and Help documentation that targets the users of the solution in both the modern user interface and the classic user interface.
 - Import and restore the tenant snapshot (if the ISV has provided one) with demonstration data, and perform Key Functionality Verification Tests.
 - Review the source code of the solution's extension libraries to verify how complex ERP operations from the standard Acumatica ERP application are invoked or customized (or both) by the solution.
 - Unpublish all customizations, and verify that no ISV solution components remain in the Acumatica ERP application folder.
- For a connected solution, the test engineer will perform these steps:
 - Deploy a brand-new single-tenant Acumatica ERP instance with the Sales Demo data template, and make it publicly available over the Internet.
 - Configure Acumatica ERP features in accordance with the license requirements of the ISV solution.
 - Import and restore the tenant snapshot (if the ISV has provided one) with demonstration data.

- Run the ISV solution locally or schedule an online conference session with the ISV to verify how key integration scenarios are performed by the solution via the Acumatica ERP web services API.
- Perform select key integration scenarios with the Acumatica ERP environment, which accepts and provides connections only through TLS v1.2, to verify **Requirement 4.6**.
- If the solution utilizes Acumatica ERP screens through the screen-based web services API, localize the publicly available Acumatica ERP instance and perform select key integration scenarios to verify **Requirement 1.9**.
- For a composite solution, the test engineer will first perform all applicable testing steps for an embedded solution on a local Acumatica ERP instance. After successful completion of all applicable testing steps for the embedded solution category, the test engineer will proceed with all applicable testing steps for a connected solution to verify the remaining requirements. To prepare a publicly available Acumatica ERP instance for the verification of key integration scenarios performed by the solution via the Acumatica ERP web services, the test engineer will generally perform the following steps:
 - Deploy a brand-new single-tenant Acumatica ERP instance with the Sales Demo data template, and make it publicly available over the Internet.
 - Configure Acumatica ERP features in accordance with the ISV solution license requirements.
 - Import and publish all customizations provided by the ISV.
 - Import and restore the tenant snapshot (if the ISV has provided one) with demonstration data. Otherwise, the test engineer will set up the solution following the steps in the installation and configuration guide provided by the ISV.

After the test engineer completes initial review of the solution, the ISV will receive a draft of the certification report with comments on each certification requirement and recommendation. If certain certification requirements or recommendations are not applicable to the solution, appropriate comments will be added for each requirement or recommendation. If a solution failed to meet a certification requirement or recommendation, the test engineer will add a comment into the certification report for this requirement or recommendation explaining the reasons the solution failed to comply with that requirement or recommendation.

After successful completion of all the certification requirements applicable to the solution, the test engineer will prepare the final version of certification report and email it to the representative of the ISV. To provide both parties with a record of all communications during the certification process, we recommend that the ISV representative use the certification case for all matters related to the solution certification.

Documentation Requirements

When you submit your ISV solution for testing for the first time, you must include the following documentation:

- The full source code of the extension libraries included in your solution's redistributable deployment package.
- A description of the business functionality that your solution provides, and examples of key usage scenarios. See *ISV Solution Key Functionality Verification Test*.
- A list of the solution objects and integration scenarios submitted for the test in an Excel workbook. See *Requirement 0.1*. The list of solution objects must also include the following:
 - A list of all vendor and third-party assemblies. See *Requirement 1.1*, *Requirement 1.3*, and *Requirement 1.7*.
 - A list of all external services used by your solution. See *Requirement 1.8*.
 - A list of all integration scenarios performed by your solution via the Acumatica ERP web services API. See *Requirement 1.11*.
- Proof of certification for each team member who has worked on the solution. See *Requirement 0.2*.
- An explanation and justification for any Acuminator errors and warnings of levels 1 and 2. See *Requirement 1.1*.
- A justification explaining why the solution does not meet specific integration guidelines for the contract-based web services API. See *Requirement 1.10*.
- An explanation of how the solution stores a URL and manages credentials to access the Acumatica ERP application. See *Requirement 1.12*.
- An installation and configuration guide. See *Requirement 2.2*.
- A VAR-facing customization and extensibility guide. See *Requirement 2.3*.
- Any justification explaining why the solution does not meet specific user experience requirements. See *Requirement 3.1*.
- An explanation of any functionality that restricts the functionality of Acumatica ERP. See *Requirement 3.2*.
- Sample data for testing; this does not need to be part of the solution installation. See *Requirement 4.2*.
- A description of which Acumatica ERP license is required for installation of the solution. See *Requirement 4.5*.
- A list of all resources that the solution adds to the Acumatica ERP environment and instructions for uninstalling the solution. See *Requirement 4.6*.
- Database upgrade scripts and documentation. See *Requirement 5.1*.

ISV Software Solution Requirements and Recommendations

Prerequisites

Your ISV solution must meet the following prerequisites before any other test is performed:

- [Requirement 0.1: Solution objects must be listed in an Excel workbook.](#)
- [Requirement 0.2: The ISV should present proof of certification for each team member who has worked on the solution.](#)

0.1 Solution objects and integration scenarios must be listed in an Excel workbook.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✓ | ✓ | ✓ |

Summary and Intent

When an ISV solution is submitted for testing, the ISV is responsible for listing all solution objects and integration scenarios in the [Solution Objects and Integration Scenarios](#) Excel workbook that is provided by Acumatica. To provide customers and reselling partners with an overview of which objects and integrations have been tested, this list will be attached to the final certification report and will be available in Solution Central.

Resources

None

How to Comply

Provide a list of solution objects and integration scenarios in an Excel workbook grouped by their type, which can be any of the following:

- Site map nodes
- Mobile site map nodes
- Business logic controllers (BLCs) and BLC extensions
- Data access classes (DACs) and DAC extensions
- Segmented keys
- References to DACs from the standard Acumatica ERP application
- Integration scenarios performed by the solution via the Acumatica ERP web services
- Complex ERP operations from the standard Acumatica ERP application that are invoked or customized (or both) by the solution
- Push notifications

- Third-party assemblies used by the solution
- External services utilized or exposed by the solution
- Import and export scenarios

For every integration scenario performed via the Acumatica ERP web services, indicate all applicable options from the following list that describe how each scenario can be executed from within your solution:

- Only by a user
- In the background by a scheduled task
- In response to a push notification the ISV solution has received

A complex ERP operation is an operation that either is executed by the standard Acumatica ERP application in the background thread or requires the use of at least one additional BLC instance for its completion. The ISV must demonstrate how the solution invokes or customizes (or both) complex operations from Acumatica ERP by providing detailed explanations with code samples for each operation.

Test Methodology

To verify this requirement, the test engineer will select **File > Export ISV Solution Objects Workbook** in the main menu of the Customization Project Editor to generate an Excel workbook with solution objects grouped by their type. The test engineer will compare this file with the Excel workbook that was received from the ISV and note any discrepancies. After that, the test engineer will review references from new application objects introduced by the ISV solution to DACs from the standard Acumatica ERP application to verify that foreign keys defined in your solution's application objects uniquely identify an Acumatica ERP record.

Additionally, the test engineer will review all complex operations listed in the solution objects and the integration scenarios listed in the Excel workbook submitted with your solution for testing to make sure the operations comply with the following requirements:

- All of the changes performed by a customized operation must be committed to the database within the same transaction that is used to commit the changes by the standard complex Acumatica ERP operation.
- If an error is generated by the standard complex Acumatica ERP operation, a customized operation must revert all changes it has made.
- A customized operation must neither duplicate the logic performed by the standard complex operation nor completely replace the standard Acumatica ERP operation.
- Whenever the ISV solution invokes a complex Acumatica ERP operation, it must always obtain the result of the operation execution, whether the operation is executed by Acumatica ERP synchronously or asynchronously.

Criteria for Passing

This requirement is mandatory. If the solution contains objects that were not included in the list provided by the ISV, then it will fail the test. Failure to comply with the requirements set for references to DACs from the standard Acumatica ERP application or complex ERP operations invoked or customized (or both) by the ISV solution will cause the solution to automatically fail the test.

0.2 The ISV should present proof of certification for each team member who worked on the solution.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | ✔ | ✔ |

Summary and Intent

All ISV team members who work on the solution should go through Acumatica online training classes at the Acumatica Partner University and achieve Training Badges according to their roles on the team and their areas of responsibility. (The achievement of these badges is required for technical team members and strongly recommended for business domain experts.) When an ISV solution is submitted for testing, the ISV is responsible for providing a list of team members who worked on the solution, following the format of the [Proof of Certification](#) Excel workbook provided by Acumatica.

Resources

None

How to Comply

Ensure that your technical team members have achieved appropriate Acumatica developer badges before they start designing and developing the solution. We also recommend that business domain experts achieve appropriate Acumatica consultant badges in the areas of Acumatica ERP that your solution integrates with.

Test Methodology

The test engineer will verify that your team members hold the required Acumatica badges, based on the type and specifics of your solution.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, it will fail the test. Failure to present proof of certification for business domain experts will not cause the solution to automatically fail the test.

Development Requirements

Your solution must meet the following development requirements:

- [Requirement 1.1: The solution-specific managed code must be written in C# and compiled on .NET Framework 4.7.1, and must pass the required code analysis tests.](#)
- [Requirement 1.2: New application objects must use their assigned prefix.](#)
- [Requirement 1.3: The ISV solution must follow standard Acumatica version conventions and make its version information available.](#)
- [Requirement 1.4: The solution-specific database schema changes must follow Acumatica design guidelines and be packaged into the customization project.](#)
- [Requirement 1.5: The solution-specific database tables and columns must be mapped to data access classes \(DACs\).](#)
- [Requirement 1.6: The ISV solution must follow localization best practices.](#)
- [Requirement 1.7: The ISV solution must perform all data access through Acumatica business logic.](#)
- [Requirement 1.8: URLs to access external services used by the ISV solution must be configurable and their credentials must be protected by means of encryption.](#)
- [Requirement 1.9: The ISV solution must include WSDL schemas of all the Acumatica ERP screens it utilizes through the screen-based web services API.](#)
- [Requirement 1.10: The ISV solution must follow integration guidelines for the contract-based web services API.](#)
- [Requirement 1.11: The ISV solution must comply with core Acumatica ERP integration guidelines.](#)
- [Requirement 1.12: The URL to access the Acumatica ERP application used by the ISV solution must be configurable and its credentials managed securely.](#)

1.1 The solution-specific managed code must be written in C# and compiled on .NET Framework 4.7.1, and must pass the required code analysis tests.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

The managed code specific to the ISV solution must be written in C# 7.0 and compiled on Microsoft .NET Framework 4.7.1 without any level 2 warnings or other less severe warnings; the code must also pass the code analysis tests provided by Visual Studio and Acuminator. Additionally, an ISV solution must not include any separate C# code files or any kind of customization project items that are capable of running some kind of code (such as DAC and Code items in a customization project) outside of the compiled extension libraries.

Resources

Visual Studio 2017 includes code analysis tools. You can download and install Acuminator from the Visual Studio Marketplace.

For information on the C# compiler option, which should be used to specify the warning level the compiler displays, refer to the C# Compiler Options page on Microsoft Docs: <https://docs.microsoft.com/en-us/dotnet/csharp/language-reference/compiler-options/warn-compiler-option>.

How to Comply

Violation of the code analysis test rules implemented in Acuminator will result in an error or a warning reported by Visual Studio. The code analysis test rules, which report about warnings, have been assigned one of the following levels:

- W1: Significant warnings
- W2: Production quality warnings
- W3: Informational warnings

To pass the requirement, you must address in the code of the solution all errors and warnings of levels W1 and W2. However, it is a good practice to act on all warnings of all levels.

Also, ensure that your solution does not include any items in the following pages of the Customization Project Editor:

- Data Access
- Code

Test Methodology

The test engineer will use Acuminator to analyze full source code of your solution-specific extension libraries distributed by the solution. If Acuminator reports any error or warning of level W1 or W2, the ISV must provide a written explanation and justification in a separate document. The exception is that if your solution uses any third-party assemblies, the assemblies do not need to comply with this requirement. The ISV should provide a list of all third-party assemblies used by the solution, along with their licenses and versions.

Note: An explanation by the ISV of the reason for the violation does not guarantee that a waiver will be granted by Acumatica.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, it will fail the test.

1.2 New application objects must use their assigned initials.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

When an ISV solution is registered, Acumatica will assign initials for that ISV solution to use. The intent of this requirement is to minimize the probability of conflicts among multiple ISV solutions installed in the same Acumatica ERP environment. The initials represent a combination of two to four symbols and are composed of 26 (A-Z, case-insensitive) Latin letters. These assigned initials are intended to be used only in the ISV solution to which they were assigned.

The names of new objects in your solution must use the assigned initials according to the following rules:

- Custom DACs must start with the assigned initials, although this is not necessary for fields.
- Custom fields defined for DACs from Acumatica ERP or Acumatica xRP assemblies (including the ones defined in a DAC extension that is mapped to an extension table) must start with the *Usr* prefix, followed by the assigned solution initials. (The *Usr* prefix is optional for fields that are not bound to the database and is unnecessary for the fields defined in a DAC extension that is mapped to an extension table.)
- DAC extensions must start with the assigned initials.
- Custom BLCs, attributes, and classes containing localizable messages must start with the assigned initials.
- BLC extensions must start with the assigned initials.
- Custom data views and action names must start with the assigned initials when declared within BLC extensions.
- The numbering used on custom screens and reports must start with the assigned initials.
- The screen IDs of custom site map nodes (including the ones associated with generic inquiries, dashboards, and reports) must start with the assigned initials.
- Solution-specific push notifications and web service endpoints names must start with the assigned initials.

Note: Legacy customization objects with the *Cst_* prefix are not allowed in an ISV solution.

Resources

The main aspects of the application design and style conventions used in the Acumatica ERP environment are explained in the [Acumatica Application Design Guidelines](#).

How to Comply

Ensure that new objects in your solution (including the objects defined in extension libraries distributed by the ISV solution) comply with this requirement by selecting **File > Validate Project Prefix** on the Customization Project Editor menu. To pass this requirement, you must fix the names of new objects in your solution which are causing errors received during the new object prefix validation.

Test Methodology

The test engineer will select **File > Validate Project Prefix** on the Customization Project Editor menu to verify that the new application objects introduced by the ISV solution comply with this requirement.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, it will fail the test.

1.3 The ISV solution must follow standard Acumatica version conventions and make its version information available.

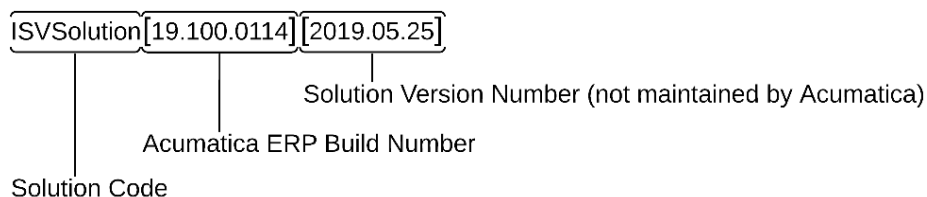
| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

You must follow standard Acumatica versioning conventions and assign a version number to the solution in accordance with the version of Acumatica ERP. For support purposes, a user must be able to identify the version of the ISV solution from the user interface. Managed assemblies provided as part of the ISV solution must be of the same version as the ISV solution.

Resources

The following illustration demonstrates the version labeling that must be used by the ISV. Both the Acumatica ERP build number and the ISV solution version number must be written within brackets. There should be no spaces between the solution name, Acumatica ERP build number, and solution version number. Solution version number can only be composed of Latin letters (A-Z and a-z, case-sensitive), numbers, square brackets, and periods.



Note: Labeling hotfixes is the recommended approach when hotfixes are provided for previously released versions of your solution.

How to Comply

Ensure that version information for your solution follows standard Acumatica version conventions and that version information is available to the user. The ISV must assign an identical version to all .Net assemblies provided as part of the ISV solution. The exception is that if your solution uses a third-party assembly, the assembly version doesn't need to match with the ISV solution version. The ISV should provide a list of all third-party assemblies used by the solution along with their licenses and versions.

Test Methodology

The test engineer will verify that version information for your solution and its included .Net assemblies follows standard Acumatica version conventions and is available to the user.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not comply with this requirement, it will fail the test.

1.4 The solution-specific database schema changes must follow Acumatica design guidelines and be packaged into the customization project.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

All ISV solution-specific database tables must have a primary key constraint defined on at least one column. There are no strict requirements on how to define column-level constraints and foreign keys for the ISV solution-specific database tables. Whether or not you should define constraints at the database level, except for the primary key constraints, depends on the design approach used in the ISV solution.

The ISV solution-specific database tables must contain all of the following columns:

- *CompanyID*, which is required to be a part of the primary key constraint and is essential to work in multi-tenant environments
- *NoteID*, which is a global identifier for an object within the Acumatica ERP environment
- Audit columns, to allow Acumatica to automatically collect and store meta information
- *Timestamp*, which is required for concurrency management, except for tables storing accumulated values

All extension tables created and used by an ISV solution must meet the following requirements:

- Contain *DeletedDatabaseRecord*, if one exists in the base table
- Share the same primary key as defined for the base table

All ISV solution-specific database schema changes must be packaged into a customization project. SQL scripts are strictly prohibited unless they are provided as part of database upgrade scripts. An ISV solution must not include any kind of database objects that are capable of running some kind of code (such as stored procedures, triggers, functions, and views).

Resources

The main aspects of database design used in the Acumatica ERP environment are explained in the [Acumatica Database Design Guidelines](#).

For information about packaging database schema changes into a customization, refer to [Customizing the Database Schema](#).

For information on extension tables, see [Requirements for an Extension Table Schema](#).

How to Comply

Ensure that your solution-specific database schema changes comply with this requirement by selecting the **Validate Highlighted Project** or **Validate Multiple Projects** menu command on the **Validations** menu of the Customization Projects (SM204505) form. To pass this requirement, you must address in the solution-specific database schema all errors received during the validation of database schema changes.

Test Methodology

The test engineer will select the **Validate Highlighted Project** or **Validate Multiple Projects** menu command on the **Validations** menu of the Customization Projects (SM204505) form to verify that database schema changes introduced by the ISV solution comply with this requirement.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, it will fail the test.

1.5 The solution-specific database tables and columns must be mapped to data access classes (DACs).

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

All ISV solution-specific database tables must be mapped to data access classes (DACs) that define the data object model of your solution. An ISV solution should not create any database columns that are not mapped to a DAC field, except for the *CompanyID*, *CompanyMask*, and *DeletedDatabaseRecord* columns handled automatically by the Acumatica xRP framework. All database columns created by your solution, regardless of whether they were created for an ISV solution-specific table or for one of the Acumatica ERP application tables, must be of the supported data type corresponding to the data type of all DAC class fields bound to the column. To verify the correspondence between the data types of an ISV solution database column and all DAC fields bound to it, Acumatica ERP will analyze all field definitions in DACs and DAC extensions, along with the definition of the database column in the customization project.

Resources

The main aspects of database design used in the Acumatica ERP environment are explained in the [Acumatica Database Design Guidelines](#).

For information on defining data access classes and DAC extensions, see [Application Programming Overview](#) in the Acumatica Framework Development Guide and [DAC Extensions](#) in the Acumatica Customization Guide.

For information about packaging database schema changes into a customization project, refer to [Customizing the Database Schema](#).

How to Comply

Ensure that your solution-specific database tables and columns comply with this requirement by selecting the **Validate Highlighted Project** or **Validate Multiple Projects** menu command on the **Validations** menu of the Customization Projects (SM204505) form. To pass this requirement, you must address either in the code of the solution or in the solution-specific database schema all errors received during the validation of the solution-specific database tables and columns.

Test Methodology

The test engineer will select the **Validate Highlighted Project** or **Validate Multiple Projects** menu command on the **Validations** menu of the Customization Projects (SM204505) form to verify that all ISV solution-specific database tables and columns comply with this requirement.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, it will fail the test.

1.6 The ISV solution must follow localization best practices.

| | | Solution Category | | |
|----------|-------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab test | ✔ | | ✔ |

Summary and Intent

The intent of this requirement is to make sure that ISVs build translatable and localizable software.

Resources

For information on the recommended practices to prepare your solution code for translation and localization, refer to [Localizing Applications](#).

How to Comply

Acumatica ERP provides the functionality to perform localization to one system locale or multiple system locales. It's possible to maintain the user interface and wikis in multiple languages if there are multiple locales set up in the Acumatica ERP environment. Localization includes the usage of locale-specific settings and the translation of the strings used on the application interface. To provide a consistent user experience, all text constants must be multi-language enabled unless they refer to computer-to-computer communication, such as building XML documents or integrating with other applications.

Even if you are not localizing your solution into other languages, you must consider how your solution will be translated to better accommodate specific terminology requirements. An ISV solution must be shipped with English (en-US) language strings and optionally complemented with the target language or languages for the solution.

Test Methodology

The test engineer will use Acuminator to analyze full source code of your solution-specific extension libraries distributed by the solution. If Acuminator reports about any **W2 Localization** warning, the ISV must provide a written explanation and justification in a separate document. Additionally, the test engineer will use the Validation Tool to check that no localization warnings or errors are reported on any screen in the Acumatica ERP environment.

Note: Explaining the reason for the violation does not guarantee that a waiver will be granted by Acumatica.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not meet the translation and localization multi-language requirements, then it will fail the test.

1.7 The ISV solution must perform all data access through Acumatica business logic.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✓ | | ✓ |

Summary and Intent

To ensure that your solution maintains data consistency, complies with the Acumatica security model, and does not reduce the security level that is present for the Acumatica ERP environment, all access to data must be performed through Acumatica business logic.

Resources

For information on the recommended practices for implementing business logic, refer to [Implementing Business Logic](#).

For information about the customization of the business logic of Acumatica ERP, see [Customizing Business Logic](#).

How to Comply

Ensure the following:

- All business logic and data access is implemented through business logic controllers (BLCs).
- To perform CRUD operations inside the Acumatica ERP environment, your solution must never directly access the database or utilize third-party tools, such as ADO.Net objects or ORM tools of any sort.
- Your solution must not utilize database objects that are capable of running some kind of code (such as stored procedures, triggers, functions, and views).
- Verify that your solution does not make any use of .Net reflection.

Test Methodology

The test engineer will select **Extension Library > Analyze Referenced Assemblies** on the Customization Manager menu to obtain the list of all utilized methods from the assemblies referenced by the ISV solution. The test engineer will review this list to verify that the ISV solution complies with this requirement. The ISV should provide a list of all third-party assemblies used by the solution, along with their licenses and versions.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, it will fail the test.

1.8 URLs to access external services used by the ISV solution must be configurable and their credentials must be protected by means of encryption.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

The intent of this requirement is to make sure that ISVs build configurable solutions, which don't tie a customer to the owner of the source code and make it harder to deploy the solution to multiple locations and install it for multiple customers. Because the credentials to access an external service are considered to be sensitive data, it's required that this information be stored encrypted in the Acumatica ERP database and never shown in the user interface without masking.

Resources

For information about how sensitive information is stored encrypted in the Acumatica ERP database, refer to [Data Encryption in Acumatica ERP](#).

How to Comply

Ensure the following:

- The deployed ISV solution can be made to point to multiple external services without the need to edit source code, recompile source code, or run proprietary software to change the configuration.
- For a deployed ISV solution, credentials to access an external service can be changed without the need to edit source code, recompile source code, or run proprietary software to change the configuration.
- All sensitive data necessary to access an external service is stored encrypted in the Acumatica ERP database and never shown in the user interface without masking.

The ISV should provide a list of all external services used by their solution. For every external service, the ISV should also provide the following information:

- The URL, credentials, and other necessary details required to configure and test the connection with the external service
- The name and location of the setup screen to enter the URL, credentials, and other necessary details to configure and test the connection with the external service

Test Methodology

For every external service used by an ISV solution, the test engineer will perform these steps:

- Verify that the connection to the external service can be configured and tested on an appropriate setup screen.
- Confirm that the sensitive data required to access the external service is masked on an appropriate setup screen and is stored encrypted in the Acumatica ERP database.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

1.9 The ISV solution must include WSDL schemas of all the Acumatica ERP screens it utilizes through the screen-based web services API.

| | | Solution Category | | |
|----------|-------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab test | | ✔ | ✔ |

Summary and Intent

All ISV solutions communicating with Acumatica ERP through the screen-based web services API must include WSDL schemas of all the screens they utilize through the screen-based API. The intent of this requirement is to minimize the probability of breakdowns and incompatibility issues caused by the translations and localizations made by the customer in their Acumatica ERP environment. We recommend that you upgrade your solution to work with Acumatica ERP through the contract-based web services API because of its built-in protection against UI changes and its enhanced security aspects (thanks to the support of the OAuth 2.0 protocol for authorization).

Resources

For information on the Screen-Based API Wrapper, refer to [Working with the Screen-Based SOAP API](#).

How to Comply

Because of the connection of the screen-based API with Acumatica ERP screens, the ISV solutions using this API are sensitive to the UI changes in the system. To ensure that your solution does not depend on the UI changes in the system, you must store the WSDL schemas of Acumatica ERP screens along with your solution and reuse these WSDL schemas in your solution to work with Acumatica ERP through the screen-based web services API by using one of the following approaches:

- For the ISV solutions that were built using Microsoft Visual Studio and the Microsoft technology stack, we recommend using the screen-based API wrapper to obtain the schema of each screen from Acumatica ERP.
- For the ISV solutions that were developed with a different technology, you must manually obtain the WSDL schema of each screen from Acumatica ERP to store it locally in an XML file and distribute it along with your solution. Instead of requesting the WSDL schema of each screen from Acumatica ERP at runtime, your solution must use the SetSchema() method to change the schema of a screen to match the stored solution-specific WSDL schema.

Test Methodology

The test engineer will use the Validation Tool to localize the Acumatica ERP application onto which a tenant snapshot with demonstration data was previously imported and restored. After that, the test engineer will launch the ISV solution and perform select Key Functionality Verification Tests to check that no breakdowns or errors are reported by the solution.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

1.10 The ISV solution must follow integration guidelines for the contract-based web services API.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | | ✔ | ✔ |

Summary and Intent

The contract-based web services API operates with business objects that do not depend on Acumatica ERP screens. Each contract of the web service is fixed and does not change based on system customization, localization, or any other changes made to Acumatica ERP. Although in the same Acumatica ERP environment it's possible to set up multiple endpoints of different versions of system contracts, we recommend that your solution operate with a single contract-based endpoint of a specific version. It is not prohibited for the ISV solution to use more than one contract-based endpoint, but it must never use multiple versions of the same endpoint to work with a particular major version of Acumatica ERP.

Resources

The main concepts that are related to the contract-based web services API are explained in [Configuring the Contract-Based SOAP and REST API](#).

For the list of system contract versions that are supported by Acumatica ERP and the main differences between them, see [Comparison of Contract Versions](#).

How to Comply

Ensure that all contract-based endpoints used by your solution meet the following requirements:

- The system contract of a solution-specific endpoint must be among the list of contract versions supported by Acumatica ERP. It's not required to upgrade to a more recent system contract unless doing so will lead to a guaranteed performance boost on your solution's side or will significantly reduce the amount of resources consumed in the Acumatica ERP environment.
- If your solution does not require any additions or modifications to the preconfigured contract-based *Default* endpoint, it must use only the *Default* endpoint. If the *Default* endpoint does not contain all elements necessary for the operation of your solution, you must extend the preconfigured contract-based *Default* endpoint and add the needed elements to the extended endpoint.
- The use of custom endpoints, which do not extend the preconfigured *Default* endpoint, is strictly prohibited, as are custom endpoint adapters. The exception is that if the custom endpoint contains only the ISV solution-specific business objects that are not included in the standard Acumatica ERP application, it does not need to comply with this requirement.

If your solution can be used with multiple versions of the same endpoint, then you must state this in your documentation. Note that your documentation should explain which version of the solution-specific endpoint should be used with each supported major version of Acumatica ERP.

Test Methodology

The test engineer will review the contract-based endpoint used by your solution to verify that it complies with this requirement and will launch the Validate Endpoint procedure from the Web Service Endpoints screen to verify that no errors are reported for this endpoint. While performing Key Functionality Verification Tests, as described in **Requirement 1.11**, the test engineer will use an HTTP monitor to analyze all traffic between your solution and the Acumatica ERP environment to verify that your solution uses only contract-based endpoints of the specified versions.

If your solution deviates from any of the requirements listed above, then you must provide a written explanation and justification in a separate document.

Note: Explaining the reason for the deviation does not guarantee that a waiver will be granted by Acumatica.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

1.11 The ISV solution must comply with core Acumatica ERP integration guidelines.

| | | Solution Category | | |
|----------|-------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab test | | ✔ | ✔ |

Summary and Intent

Integrations performed by your solution through the Acumatica ERP web services API must comply with core Acumatica ERP integration guidelines. This compliance ensures that these integrations are designed efficiently, don't consume excessive resources, and maintain data consistency.

Resources

For information about the screen-based SOAP API, refer to [Working with the Screen-Based SOAP API](#), [Working with Commands of the Screen-Based SOAP API](#), and [Screen-Based SOAP API Reference](#).

For information about the contract-based SOAP API, see [Working with the Contract-Based SOAP API](#) and [Contract-Based SOAP API Reference](#).

For information about the contract-based REST API, refer to [Working with the Contract-Based REST API](#) and [Contract-Based REST API Reference](#).

For information on configuring push notifications for the external applications to track data changes inside Acumatica ERP, see [Configuring Push Notifications](#).

How to Comply

Ensure the following:

- To synchronize data between Acumatica ERP and an ISV solution data storage, you must follow one of the approaches below:
 - Configure push notifications in Acumatica ERP to notify the ISV solution about data changes in Acumatica ERP. Push notifications are considered to be a more reliable and efficient mechanism to track data changes in Acumatica ERP compared to continual web service requests to determine whether there were any changes made in the Acumatica ERP application.
 - Implement a mechanism to obtain from Acumatica ERP only the data modified since the last synchronization. When requesting data through the screen-based or contract-based API, the ISV solution may never request more than 5,000 top-level records in one web service call or export significant amounts of records in batches of up to 5,000 records. If to obtain data from Acumatica ERP, your solution uses a generic inquiry (GI), it must always set the values of GI parameters in such a way that the GI will

return no more than 10,000 records. If on a regular basis it takes longer than five minutes for an ISV solution to obtain data from Acumatica ERP or the average size of the message received from the Acumatica ERP web services API exceeds 2 megabytes, you must reduce the number of records requested in one web service call even further.

- A web service call inserting or updating a top-level record in Acumatica ERP with more than 200 details must be split into multiple consequent calls, each processing no more than 200 details. In the last web service call with changes to details, the ISV solution must also request the values of one field or multiple fields from the top-level record, which is sufficient to verify that all details were processed successfully.
- In cases when data from Acumatica ERP is exported through the OData protocol, the total time spent by Acumatica ERP to process the request from the ISV solution should not exceed 20 seconds. We recommend that you start using the OData filter system query option to limit the number of records exported through OData as soon as you notice the aggregate duration of the URL request execution on the server or the aggregate duration of the execution of all the SQL requests in the URL request going longer than 10 seconds.
- The ISV solution-specific generic inquiries exposed via the OData protocol must not contain any warnings about potential performance issues.

We also recommend that you design your solution with the intention to not export more than 10,000 records in one call to the Acumatica web services API. By means of various filters, one web service call should request the least possible number of top-level records (or the least possible number of detail records when data is exported from a presorted generic inquiry), ideally keeping the number of exported records under 5,000.

Note: Any web service call sent by your solution to Acumatica ERP application must meet all of the requirements above. To reduce the payload between the ISV solution and the Acumatica ERP application, we highly recommend that your solution's requests always explicitly specify the fields of the entity to be returned from Acumatica ERP.

Test Methodology

To verify this requirement, the test engineer will perform these steps:

1. Review all integration scenarios listed in the Excel workbook with solution objects and integration scenarios, which was submitted with your solution for testing.
2. Ensure that a Key Functionality Verification Test was provided for each integration scenario listed in the solution objects and integration scenarios Excel workbook.
3. Use an HTTP monitor to record all traffic generated between your solution and the Acumatica ERP environment during the execution of every provided Key Functionality Verification Test.
4. Analyze the recorded traffic to verify that while your solution performs typical operations, it complies with core Acumatica ERP integration guidelines.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

1.12 The URL to access the Acumatica ERP application used by the ISV solution must be configurable and its credentials managed securely.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | | ✔ | ✔ |

Summary and Intent

The intent of this requirement is to make sure that ISVs build configurable solutions that securely manage the credentials used to connect to the Acumatica ERP application. Because the credentials to access an Acumatica ERP environment are sensitive data, we recommend that this information never be entered or stored inside your solution and that the authorization be performed through the OAuth 2.0 mechanism. For those ISV solutions that can only be configured and set up by your employees or are hosted by you, you must provide a separate document explaining how the URL and credentials to access the Acumatica ERP application are configured and managed in your solution.

Resources

For information about OAuth 2.0 support in Acumatica ERP, see [Authorizing Client Applications to Work with Acumatica ERP](#).

How to Comply

You must provide a separate document explaining how the URL and credentials to access Acumatica ERP application are configured and managed in the ISV solution.

If the URL and credentials are stored on the ISV solution side, ensure the following:

- For a deployed ISV solution, the credentials to access an Acumatica ERP environment can be changed without the need to edit source code, recompile source code, or run proprietary software to change the configuration.
- All sensitive data necessary to access the Acumatica ERP environment is managed securely by your solution and never shown in the user interface without masking.

For an ISV solution communicating with the Acumatica ERP application solely via the contract-based web services API, we highly recommend that the authorization be performed through the OAuth 2.0 mechanism, to eliminate the need to acquire or store the credentials to access an Acumatica ERP environment inside your solution. Because currently in Acumatica ERP, support of OAuth 2.0 is limited to the contract-based REST API and the contract-based SOAP API, ISV

solutions that integrate with Acumatica ERP applications through the screen-based web services API or the OData protocol are still required to pass credentials for authentication. If the credentials to access the Acumatica ERP application are never stored on your solution side, then you must state this in the provided documentation.

Test Methodology

The test engineer will review the provided documentation to verify that the ISV solution securely manages the credentials to connect to Acumatica ERP.

Additionally, to verify this requirement, the test engineer will perform these steps:

1. Identify the method of URL configuration, which must be described in the installation and configuration guide, as described in *Requirement 2.2*.
2. Verify that the solution can be configured as described in the installation and configuration guide.
3. Verify the following scenarios:
 - The solution works with at least two different Acumatica ERP user accounts.
 - The solution works with at least two different tenants inside the same Acumatica ERP application.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not pass this requirement, then it will fail the test.

User Assistance and Product Documentation Requirements and Recommendations

Your solution must comply with the following requirements and recommendations:

- [Requirement 2.1: The ISV solution must include Help that is targeted to the solution user.](#)
- [Requirement 2.2: The ISV must provide an installation and configuration guide.](#)
- [Recommendation 2.3: The ISV solution documentation should include sections for technically oriented users.](#)

2.1 The ISV solution must include Help that is targeted to the solution user.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✓ | | ✓ |

Summary and Intent

You must provide Help documentation that targets the users of your solution. If necessary, you should also provide Help for administrative tasks. We recommend that you create Help documentation for your solution in a separate wiki and package the entire Help wiki in a separate customization project. Because Help is usually less prone to changes, distributing it independently from updates of your solution is always a welcome way to shorten the time and to reduce the number of steps required to update the ISV solution.

If Help documentation for your solution is distributed via a separate customization project, it must follow the same version labeling as described in **Requirement 1.3**. The only difference is that the ISV solution name must be followed by the *_WIKI* suffix to help distinguish the main redistributable ISV solution package from the customization project with Help documentation.

Resources

For information on managing wikis and packaging them into a customization project, see [Managing Wikis](#) and the [Acumatica Customization Guide](#).

For information about translating wiki articles in a different language, refer to [Managing Locales and Languages](#) in the Acumatica ERP User Guide.

How to Comply

The documentation for an ISV solution must provide a user experience that is consistent with the Acumatica ERP documentation. We recommend that the Help documentation for your ISV solution contain the following sections:

- Release notes or a summary of changes

- Installation and configuration guide (see *Requirement 2.2*)
- The business processes of the ISV solution or an overview of the key use cases of the ISV solution
- At least one chapter dedicated to detailed descriptions of each business process or key use case of the ISV solution
- Form reference information for the ISV solution
- Navigation reference information for the ISV solution

Additionally, Help documentation for your solution must meet the following requirements:

- It must be easy for a user to access and navigate.
- It should explain all added or changed objects and functionality as follows:
 - There must be a dedicated wiki article for every custom screen that your solution adds to the Acumatica ERP environment.
 - For every standard Acumatica ERP screen or process that was customized, appended, or restricted by your solution, you must provide a separate wiki article with explanations of changes.
- It must provide detailed coverage of every feature in your solution, including different aspects of its configuration and an explanation of how it works.
- Your Help content for solution users must be accessible from both the modern and classic user interface.

Test Methodology

The test engineer will review your Help documentation for compliance and usability. The ISV solution-specific wiki must be included and accessible from the Help dashboard of the modern user interface and the Help suite of the classic user interface. The test engineer will review a representative sample of the ISV solution screens to make sure that Help is available in the following scenarios:

- In the form-specific Help menu of the modern user interface opened when a user clicks on the Help button while viewing the majority of forms (except for reports and generic inquiries that are not described in Help) and dashboards
- When a user selects Help, the **Help** menu located on the help topic toolbar of the classic user interface (except for reports and generic inquiries that are not described in Help)

The test engineer will verify that Help documentation for your solution contains release notes or a summary of changes; such a document should cover all of the latest changes and enhancements made in your solution. Also, the test engineer will verify that the same content can be found by using Search in the Acumatica ERP environment and that the Help table of contents provides easy and straightforward navigation to the key areas and workflows of your solution.

Note: The test engineer will only validate that the required information is included. The test engineer will not verify the quality or technical accuracy of the information.

Criteria for Passing

This requirement is mandatory. If the solution does not provide Help documentation or contains no release notes or summary of changes, then it will fail the test.

2.2 The ISV must provide an installation and configuration guide.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | ✔ | ✔ |

Summary and Intent

Your solution must include an installation and configuration guide. If your solution is implemented only by your employees or is hosted by you, then an internal document explaining how it should be implemented must be provided as part of the documentation you submit to Acumatica for solution certification.

ISV partners and customers who use or deploy the ISV solution must be able to successfully deploy, configure, and manage it in an existing Acumatica ERP environment. Your documentation must provide information that allows partners and customers to successfully install or upgrade your solution in this environment.

Resources

None

How to Comply

Ensure that your solution contains installation, configuration, and upgrade documentation to allow your employees, a partner, or a customer to implement your solution in a new or existing Acumatica ERP environment. This should take the form of one PDF document, which can also refer the reader to separate documents for additional information, if necessary. At minimum, an installation and configuration guide must contain the following sections:

- A description of the solution and its key functionality
- Detailed installation and configuration steps, accompanied with screenshots and brief explanations for every setting used in a given step
- An operational checklist, which includes information about the tasks that should be performed on a regular basis (such as daily, monthly, or annually)

Test Methodology

The test engineer will review your documentation to verify that you have included an installation and configuration guide.

Note: The test engineer will only validate that the required information is included. The test engineer will not verify the quality or technical accuracy of the information.

Criteria for Passing

This requirement is mandatory. If the solution documentation does not include an installation and configuration guide, then it will fail the test.

2.3 The ISV solution documentation should include sections for technically oriented users.

| | | Solution Category | | |
|-------------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Recommended | In-lab review | ✔ | | ✔ |

Summary and Intent

Customers and VARs frequently customize and extend business software. Therefore, we recommend that in your ISV solution documentation, you include sections that explain how to use business objects from your solution in reports and generic inquiries, customize your solution, or utilize its functionality via the web services API. This type of documentation provides a more technical explanation of the solution than the documentation that targets the solution users. Its purpose is to give more technically oriented users a solid understanding of the solution and help them customize the solution to meet specific requirements.

Resources

None

How to Comply

The documentation targeted to more technically oriented users can be either included in the ISV solution Help documentation or provided in the form of a separate PDF document containing the following sections:

- An explanation of the data model for the solution, including the following:
 - A description of new and modified tables, including fields and stored data types
 - New and modified functionality and its interaction
- If your solution provides custom tenant snapshot content options, a brief description of each snapshot content option specific to your solution
- If there is a screen-based web service or a contract-based API endpoint distributed as part of your solution, code samples showing how to use the components you exposed via web APIs

- If your solution makes any changes to the mobile site map, a list of new screens that your solution adds to the mobile application, along with a list of standard mobile application screens that your solution modifies
- Detailed information about each API, web service, and other component that your solution exposes

Test Methodology

The test engineer will review your documentation to verify that you have included technical documentation for your solution.

Note: The test engineer will only validate that technical information is included. The test engineer will not verify the quality or accuracy of the information.

Criteria for Passing

This is a recommendation only. Failure to comply with this recommendation will not cause the solution to automatically fail the test.

User Experience Requirements and Recommendations

Your solution must meet the following requirements:

- [Requirement 3.1: The ISV solution must comply with core Acumatica ERP user experience guidelines.](#)
- [Requirement 3.2: The ISV solution that restricts the functionality of Acumatica ERP must document the restriction.](#)
- [Requirement 3.3: The ISV solution must report errors related to integration via the Acumatica ERP web services API in a user-friendly manner.](#)

3.1 The ISV solution must comply with core Acumatica ERP user experience guidelines.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✓ | | ✓ |

Summary and Intent

Users of your solution must have a user experience that is consistent with Acumatica ERP. It is important that users be able to reuse the knowledge they build from using the standard Acumatica ERP and expect to complete similar tasks in your solution by using the same user interface elements and the same interaction steps as in the standard application. Therefore, the user interface for your solution must comply with the Acumatica ERP user experience guidelines.

Resources

None

How to Comply

Observe the following user experience requirements and recommendations:

- Requirement 3.1.1: All custom site map nodes must be accessible in the modern and classic user interface. The exceptions are the site map nodes that are placed under the *Hidden* folder of the site map.
- Requirement 3.1.2: All links to forms from a workspace in the modern user interface and all links to forms in the navigation pane of the classic user interface must open a list of records in a tabular format. When the user clicks a record, the entry form opens to show the details of the selected record. The exceptions are forms of the setup, inquiry, or processing type and the forms associated with dashboards or reports.
- Requirement 3.1.3: To enforce PCI DSS compliance for the ISV solutions that implement credit card processing integration, these solutions must not ask for any credit card information using Acumatica xRP UI controls where the information is passed to the

Acumatica ERP application server. An ISV solution must never store any credit card information in the Acumatica ERP environment.

- Requirement 3.1.4: Any process that takes longer than 10 seconds to complete must be executed asynchronously using the standard mechanism provided by the Acumatica xRP framework.
- Requirement 3.1.5: All applicable fields should honor segment definitions configured for a tenant in the Acumatica ERP environment.
- Recommendation 3.1.6: Quantity, price, and cost fields should honor the decimal accuracy configured for a company in Acumatica ERP environment.
- Recommendation 3.1.7: ISV solutions that are required to operate in multi-currency mode should make it possible for users to work with multiple currencies on a form.
- Recommendation 3.1.8: All required fields, missing setup information, error messages, warnings, and grid line status indicators should be displayed or indicated by using the standard mechanisms provided by the Acumatica xRP framework.

If your user experience deviates from any of the requirements listed above, then you must prepare a justification for the deviation. Include this justification in your software submission package.

Test Methodology

To verify this requirement, the test engineer will review a representative sample of the ISV solution screens. The test engineer will confirm that the ISV solution screens follow the full set of applicable requirements.

Criteria for Passing

This requirement is mandatory. If the ISV solution does not follow user experience requirements, then it will fail the test. Failure to comply with user experience recommendations will not cause the solution to automatically fail the test.

3.2 The ISV solution that restricts the functionality of Acumatica ERP must document the restriction.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

End users expect that the underlying Acumatica ERP solution is fully functional. In addition, other ISVs will expect that an Acumatica ERP environment will be fully functional.

Resources

None

How to Comply

If your solution limits or breaks existing Acumatica ERP functionality or cannot coexist with Acumatica ERP functionality, then you must include documentation that explains the conflict and states that the Acumatica ERP feature or function will not be available after the user installs your solution.

Test Methodology

The test engineer will confirm that you have provided the required documentation.

Criteria for Passing

This requirement is mandatory. If the ISV solution limits or breaks existing Acumatica ERP functionality and does not document the limitation, then it will fail the test.

3.3 The ISV solution must report errors related to integration via the Acumatica ERP web services API in a user-friendly manner.

| | | Solution Category | | |
|----------|-------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab test | | ✔ | ✔ |

Summary and Intent

This requirement is to eliminate poor end-user experiences that result from non-user-friendly messages reporting about errors or other exceptional situations encountered on the ISV solution side during the communication with Acumatica ERP through the web services API.

Resources

None

How to Comply

Ensure that whenever an exceptional situation occurs during the communication with Acumatica ERP through the web services API, your solution always shows a user-friendly message and never displays only an HTTP response status code. We recommend that you design your solution integrating through the Acumatica ERP web services API with the assumption that some dependent record might be missing in Acumatica ERP application and therefore cause your solution's web service call to fail. The ISV solution must be capable of reacting to an exceptional situation and provide guidance to the user in order to solve any issue it encounters.

Test Methodology

To verify this requirement, the test engineer will perform these steps:

1. Attempt to use the ISV solution with an inaccessible Acumatica ERP application.
2. Make intentional mistakes while performing some of the provided Key Functionality Verification Tests.
3. Note any error messages that do not comply with this requirement.

Criteria for Passing

This requirement is mandatory. If the solution does not report errors related to integration via the Acumatica ERP web services API in a user-friendly manner, then it will fail the test.

Installation and Setup Requirements and Recommendations

Your solution must comply with the following requirements and recommendations:

- [Requirement 4.1: The ISV solution must deploy all its components through customization projects.](#)
- [Requirement 4.2: The ISV solution must include installable demonstration data.](#)
- [Requirement 4.3: Acumatica ERP must start without errors after the ISV solution is installed.](#)
- [Requirement 4.4 The ISV solution must not affect the performance of Acumatica ERP.](#)
- [Requirement 4.5: The ISV must document the Acumatica ERP features and license that are required for their solution installation.](#)
- [Requirement 4.6: The ISV solution must access the Acumatica ERP web services API using the TLS v1.2 protocol.](#)
- [Recommendation 4.7: The ISV should document the uninstallation procedures.](#)

4.1 The ISV solution must deploy all its components through customization projects.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✓ | | ✓ |

Summary and Intent

All components of an ISV solution must be packaged and distributed by means of a customization project. An ISV solution should not replace or modify files distributed as part of a standard Acumatica ERP application. Because Help is usually less prone to changes, we recommend packaging Help documentation for your solution in a separate customization project.

Resources

None

How to Comply

Ensure that all components of your ISV solution, including Help documentation that is targeted to the solution user, are deployed through customization projects and do not replace or modify files distributed as part of the standard Acumatica ERP application.

Test Methodology

The test engineer will review the content of all customization projects provided by the ISV to verify that none of them replaces or modifies files distributed as part of the standard Acumatica ERP application.

Criteria for Passing

This requirement is mandatory. If the solution does not deploy all its components through customization projects, then it will fail the test.

4.2 The ISV solution must include installable demonstration data.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

Demonstration data is useful for many purposes, such as sales demonstrations, training, and application testing. Therefore, you must provide at least one demonstration tenant snapshot with your solution. You must deliver the tenant snapshot with demonstration data as a separate ZIP archive file.

Resources

None

How to Comply

The demonstration data must populate all new tables in your solution with at least 20 records, except for the tables used to store setup or preference data for your solution.

Test Methodology

To verify this requirement, the test engineer will perform the following steps:

1. Import and restore the provided tenant snapshot with demonstration data.
2. Review a representative sample of the ISV solution screens to make sure that they either display a list of multiple records or allow the user to work with one record at a time and contain plenty of records to navigate to or select from.
3. Perform typical operations as described in the provided Key Functionality Verification Test.

Criteria for Passing

This requirement is mandatory. If the solution does not include demonstration data, then it will fail the test. If a provided demonstration tenant snapshot does not allow the solution to successfully pass the Key Functionality Verification Test, then the solution will fail the test.

4.3 Acumatica ERP must start without errors after the ISV solution is installed.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

This requirement is to eliminate poor end-user experiences that result from new installations. The intent of this requirement is to prevent Acumatica ERP from producing errors when it is started for the first time with an installed ISV solution.

Resources

None

How to Comply

Your installation and configuration guide must provide detailed and sufficient information to avoid errors that might occur after the installation of your ISV solution.

Test Methodology

After installation of your ISV solution, the test engineer will go through the steps described in the installation and configuration guide. Then the test engineer will use the Validation Tool to check that no errors are reported on any screen in the Acumatica ERP environment.

Criteria for Passing

This requirement is mandatory. If the solution causes errors on any screen in the Acumatica ERP environment, then it will fail the test.

4.4 The ISV solution must not affect the performance of Acumatica ERP.

| | | Solution Category | | |
|----------|-------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab test | ✔ | ✔ | ✔ |

Summary and Intent

This requirement is to eliminate poor design of the ISV solution that results in significant performance degradation of the Acumatica ERP environment.

Resources

For information about troubleshooting performance issues in the Acumatica ERP environment, refer to the [Acumatica Customization Guide](#).

How to Comply

Ensure that performance and overall responsiveness of standard Acumatica ERP screens and processes is not affected after the installation of your ISV solution. To pass this requirement, all ISV solution screens must comply with the performance benchmarks set for standard Acumatica ERP screens and processes.

Test Methodology

After installation of your ISV solution, the test engineer will import and restore the provided tenant snapshot with demonstration data. Then the test engineer will use the Performance Monitor Tool to check that the performance of standard Acumatica ERP screens and processes is not affected and all ISV solution screens comply with the performance benchmarks set for standard Acumatica ERP screens and processes.

Criteria for Passing

This requirement is mandatory. If the solution causes performance degradation of the Acumatica ERP environment or contains screens that do not comply with the performance benchmarks set for standard Acumatica ERP screens and processes, then it will fail the test.

4.5 The ISV must document the Acumatica ERP features and license that are required for their solution installation.

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | ✔ | ✔ |

Summary and Intent

If your solution requires a specific feature set to be enabled in Acumatica ERP or a specific Acumatica ERP license, such as the activation of any number of particular add-ons, you must document the features and license requirements. Also, for a solution using the Acumatica ERP web services API, you must document how many concurrent web services API requests your solution makes and what is the minimum number of web services API users required for the solution's normal operation.

Resources

[Acumatica Pricing](#) and [Acumatica Pricing FAQs](#) (requires access to Acumatica Partner Portal)

How to Comply

Ensure that you provide information about the specific features that must be enabled in Acumatica ERP prior to installation of your solution or the Acumatica ERP license configuration that your solution requires. If the enabling of a certain feature in Acumatica ERP is not required but is recommended for the operation of your solution, we recommend that you include a list of required and recommended features for your solution.

Additionally, if your solution uses the Acumatica ERP web services API, ensure that you provide information about the number of concurrent web services API requests and the minimum required number of web services API users.

Test Methodology

The test engineer will review the documentation to verify that the required features and license information is provided.

Criteria for Passing

This requirement is mandatory. If the solution does not include information on the required Acumatica ERP features and license, then it will fail the test.

4.6 The ISV solution must access the Acumatica ERP web services API using the TLS v1.2 protocol.

| | | Solution Category | | |
|----------|-------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab test | | ✔ | ✔ |

Summary and Intent

The intent of this requirement is to increase the security of the Acumatica ERP environment.

Resources

For .Net applications communicating with the Acumatica ERP web services API, the solution will differ depending on the version of the .Net Framework you are using:

- For .Net 4.6 and above: No change is needed; this version is supported by default
- For .Net 4.5: The security protocol needs to be specified before connection: `ServicePointManager.SecurityProtocol = SecurityProtocolType.Tls12;`
- For .Net 4.0: The protocol is not supported but a workaround is available: `ServicePointManager.SecurityProtocol = (SecurityProtocolType)3072;`
- For .Net 3.5: The protocol is not supported and you need to migrate your application to a more recent version of the .Net Framework

For other applications, if you are using OpenSSL to access the Acumatica ERP web services API, you might need to upgrade it to a more recent version that supports TLS v1.2. The support started on OpenSSL v1.0.1. For other frameworks, please refer to their respective documentation on this matter.

How to Comply

Ensure in the testing environment that your solution communicates with the Acumatica ERP web services API using the TLS v1.2 protocol.

Test Methodology

To verify this requirement, the test engineer will perform the provided Key Functionality Verification Tests with the Acumatica ERP environment, which accepts and provides connections only through TLS v1.2.

Criteria for Passing

This requirement is mandatory. If the solution does not use the TLS v1.2 protocol to access the Acumatica ERP web services API, then it will fail the test.

4.7 The ISV should document the uninstallation procedures.

| | | Solution Category | | |
|-------------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Recommended | In-lab review | ✔ | | ✔ |

Please note that starting on September 1, 2019, this recommendation will be converted into a requirement. If an ISV solution submitted for certification on or after this date does not pass this requirement, it will fail the test.

Summary and Intent

Customers must be able to uninstall an ISV solution. This applies to the solution-specific database schema changes and all components of the ISV solution that are deployed on the file system in the Acumatica ERP application folder.

Resources

None

How to Comply

Ensure that after the unpublishing of customizations, all components of your ISV solution are removed from the Acumatica ERP application folder. When the system unpublishes customizations, it does not delete records from the database or alter the database schema. Thus,

we recommend creating a separate customization package to delete the Help documentation and configuration data from the database as well as to revert all database schema changes that your solution has made during the installation. For those components of your solution that can be deleted from the UI, we recommend that you provide documentation listing these components grouped by the appropriate section of Acumatica ERP that customers should use to delete them manually.

Test Methodology

The test engineer will unpublish all customizations from the Acumatica ERP environment and verify that all components of your ISV solution would be removed from the Acumatica ERP application folder.

Criteria for Passing

This is a recommendation only. However, if any components of the ISV solution are left in the Acumatica ERP application folder after the unpublishing of customizations, then it will fail the test. The solution will not automatically fail the test if you fail to provide a separate customization project to delete Help documentation and configuration data from the database and revert all database schema changes that your solution made during the installation or documentation listing components that customers must delete manually from the UI.

Note: Starting on September 1, 2019, this recommendation will be converted into a requirement. If an ISV solution submitted for certification on or later than this date does not pass this requirement, it will fail the test.

Upgrade and Maintenance Requirements

Your solution must comply with the following requirement:

- [Requirement 5.1: The ISV must document the upgrade procedure.](#)

5.1 The ISV must document the upgrade procedure

| | | Solution Category | | |
|----------|---------------|-------------------|-----------|-----------|
| Type | Test Method | Embedded | Connected | Composite |
| Required | In-lab review | ✔ | | ✔ |

Summary and Intent

This requirement ensures that your solution can be upgraded from a previous version installed earlier in the Acumatica ERP environment.

Resources

None

How to Comply

Prepare and document the procedures required to upgrade your solution from a previous version. Your documentation should contain in-depth information regarding the upgrade procedure for your solution, specifically targeting the scenarios when an upgrade is performed in the Acumatica ERP environment running on a previous major version. If no additional steps, other than publishing a newer version of your solution after the upgrade of an Acumatica ERP environment, are required, this must be stated in your solution documentation.

Test Methodology

The test engineer will verify that you have described the upgrade procedure in the solution documentation.

Criteria for Passing

This requirement is mandatory. If the solution does not cover the upgrade procedure in its documentation, then it will fail the test.

ISV Solution Key Functionality Verification Test

1. Identify the intended purpose of the ISV solution.

Specify what fundamental service your solution provides. Briefly explain the purpose of the ISV solution and describe its intended audience.

2. Identify the most representative use cases for your solution.

List the key use cases for which you have designed your ISV solution. For each use case, you should provide a brief description and include a diagram illustrating all its steps with references to the appropriate section of your ISV solution. Business Process Modeling Notation (BPMN) and UML Activity Diagram are the preferred methods to model the steps of a use case from start to end.

3. Design and record functionality verification tests.

For each use case, you must design and record at least one functionality verification test. We recommend that you include in your functionality verification tests the sections listed below in the following order:

- Verification objects
- Verification methods
- Preliminary setup and configuration (if required for the provided demonstration tenant snapshot)
- Parameters
- Test procedure (written preferably using the Given-When-Then style)