



Sabre Red Apps

Developer Toolkit Overview

Red Apps are optional, authorized applications that extend the capabilities of *Sabre® Red™ Workspace*. Red Apps are Sabre's branded version of an Eclipse plug-in. They plug into and become part of the Red Workspace. A Red App can be something as simple as a script, an app that intelligently integrates mapping information to help agencies better serve their customers, or a pre-populated form that helps agencies improve customer service. Sabre Red App Certified Developers design and code these applications, and then wrap them as plug-ins for integration into Sabre Red Workspace.

Red Apps leverage the technical capabilities of the Eclipse Rich Client Platform, the open source software upon which the Red Workspace platform is built and operates. Red Apps are developed by Sabre teams and Sabre Red App Certified Developers. They are marketed and deployed through the Sabre® Red™ App Centre using Sabre Red Workspace's provisioning technology.

Red Apps are visually and physically integrated within the Red Workspace and share data with other elements of the Red Workspace, thereby providing a whole new level of integration. By choosing Red Apps that meet specific business needs, and even the specific needs of each agent in an office, certified developers will be able to create a truly custom Red Workspace environment for optimal agent productivity and customer service.

Learn more:

[Sabre Red Workspace](#)

[Sabre Red App Centre](#)

[Sabre Dev Studio](#)

[Sabre Red Workspace Developer Toolkit](#). Read about the types of Red Apps that Sabre Red App Certified Developers can build, the functionality in the Sabre Red Workspace Developer Toolkit, and skills for developers.

[Process for Developing, Purchasing, Provisioning, and Maintaining Red Apps](#). Review the process, from onboarding and development, to desktop deployment and upgrades.

Sabre Red Workspace Developer Toolkit

You can build Red Apps with a variety of internet and programming technologies, and add communications with Sabre data stores, such as the Sabre® GDS, and other Red Apps. Your Red Apps can be integrated into Sabre Red Workspace visually, or they can collect data and perform tasks behind the scenes.

The Sabre Red Workspace Developer Toolkit (or simply, "SDK") is a robust toolkit with all the tools, documentation, sample plug-ins — including source code — and utilities developers need to build Red Apps that run seamlessly in Sabre Red Workspace.

Why Was the Developer Toolkit Created?

The Developer Toolkit was created to give developers greater flexibility in building solutions that integrate within the Workspace in new ways when compared to existing developer tools. By using Red App technology, developers are able to build Red Apps with functionality that is not provided within Sabre Red Workspace, opening a whole new world of possibilities, decreasing time to market for innovative apps, and giving travel buyers the power to choose the tools they need to stay ahead.

Choose from a Variety of Development Technologies

Your choice of a programming language will depend on your development background, experience and the scope of the Red App that you want to build.

Because the technology behind the Sabre Red Workspace platform (Eclipse Rich Client Platform) allows for plug-ins (Red Apps) to be built using variety of technologies, your options range from cutting-edge technologies to more simple domain-driven technologies. Examples of cutting edge technologies include Java SWT and web technologies that allow advanced, limitless integration options in the Workspace. Simpler domain-driven technologies include examples such as using Sabre Scribe and workflow extensions for developing custom workflows or automating and customizing Sabre system processes.

List of Supported Technologies:

- Java, SWT, Swing
- Web-based Internet technologies: HTML, Typescript, JavaScript. If running on the server side, your website can be based on Java technologies, e.g. servlets or JSP. Your website can also be based on other technologies, such as Microsoft .NET Framework or PHP. A Red App that is a web app or a web page can use a custom implementation of an editor or a default implementation of an editor and a view. The custom implementation requires Java code; integration as an editor, and is based on HTML. The default editor and view implementations do not use Java code and are intended for simpler apps that do not dynamically create a URL at runtime or manage the life cycle of the editor. A JavaScript-based Red App must use these default editor or view classes. From the perspective of Red Apps, all of these technologies are HTML. There are two types of browser that can be used in Red App:
 - **WebKit:** (Recommended) Sabre Red Workspace embeds platform independent browser. The name "WebKit" is maintain to achieve backward compatibility, actually Sabre Red Workspace uses *JxBrowser* (chromium engine web browser)
The proxy used by WebKit is one set in Sabre Red Workspace login window.
 - **Native browser:** On Sabre Red Workspace and Red Apps Developer Toolkit the Browser control mode used defaults to using the compatibility mode that matches the installed Internet Explorer version. This means, for instance, that some advance capabilities in HTML

documents containing for example HTML5 canvas tags will not be shown properly, even if IE9 is installed on the machine. For more information on Eclipse browser support please visit the web page below, or access the Red App Developer to validate rendering your Web Red App. <http://www.eclipse.org/swt/faq.php#browsernativeie>

Websites with an applet must be wrapped as Swing apps.

- Sabre Scribe scripts: You can wrap your compiled Sabre Scribe script files as plug-ins for Sabre Red Workspace. This process can be easily automated, you can upload your script to *Red App Centre* and Red App plugin will be generated automatically. The wrapping of a Sabre Scribe script does not change the functionality of the script, it additionally improves the deployment and version control of the scripts. Sabre Scribe scripts can also read from or write to files in a plug-in, and update files when you have a new version of your plug-in. Your Sabre Scribe Red App can use active listening to trigger your scripts. In addition, you can use the Red App Bundle wizard to secure your scripts from unauthorized use. The Open SabreScript dialog in Red Workspace lists your scripts.

Red App Developers now also get access to Scribe Designer and Compiler directly from inside of the Sabre Red Workspace Developer Toolkit, allowing to create and modify Sabre scripts and wrap them into Sabre Red Apps all under the same developer environment.

Note: Technology choice will dictate the visual and functional integration capabilities that can be achieved through the Red Apps that are built. The Sabre Red Workspace Developer Toolkit describes detailed specifications for integration.

What Design Options Are Available?

Design Red Apps with Multiple User Interface Options

Using the Sabre Red Workspace Developer Toolkit, you can design and build Red Apps with a variety of options for UI elements:

nSRW offers consistent integration of graphical user interface with the following components available: **Pop-ups** Modals **Drawer tiles** Nudge **Hints** and much more * Full application editors, which Red Workspace renders as tabs * Views (assistant tools): These are tools that complement the capabilities of a primary editor/tab inside Sabre Red Workspace. For this reason, end-users refer to views as assistant tools. You can design your view as either a horizontal or a vertical layout. * Pop-up dialogs: These objects are very similar to a window. Dialogs in Sabre Red Workspace are the same as dialogs for most other applications. They can have variety of GUI controls, such as radio buttons, check boxes, text fields, and combo boxes. Dialogs are most commonly modal, which means that they interrupt the workflow and require the user to interact with the window before continuing. * Notification Services dialogs: A notification is a type of message box that most typically provides information to end-users in Sabre Red Workspace. A Red App may consist solely of Notification Services or notifications may complement other Red Apps. Notification Services dialogs are non-modal.

You can create the following types of Red App notifications:

- A basic text notification
- A notification with a link to reference other actions of a Red App
- A custom notification with a progress bar indicating a specific task or process is running in the background
- Basic menu and complex menu contributions: You can provide menu contributions for your Red App that are visible and menus that are activated conditionally, based on handler policies. The Red App help provides guidelines for menus based on application type.

Developers can also develop Red Apps that do not have a UI component tied to them, such as tasks running in the background.

Red App Communications Services and Events

To make communications possible, Red Workspace relies on the SRWRuntime communications bus. SRWRuntime is the single gateway between Red Apps and services that the Sabre Red Workspace platform exposes, from intercepting Sabre emulator commands, to communicating with Sabre Web Services or Sabre emulator to get Sabre GDS content, or app-to-app communication.

You can add an asynchronous event listener to Red Apps. Event listeners are notified about SRWRuntime calls either before or after an actual call to SRWRuntime. Sabre has several published events. A Red App can filter the events by using an action code to pass a command prefix. An example of an event listener is a Red App that subscribes to an Air Availability command and triggers a certain Red App action when the event is generated.

SRWRuntime services and events provide the following functionality that you can add to a Red App:

- Intercepting Sabre emulator commands
- Sending information and commands to Sabre emulator
- Sabre GDS (Sabre host) communications: This service can be used to send a single request or multiple, consecutive requests to the host, bypassing Sabre emulator and going directly to the Sabre host.
- Communicating with Sabre Web Services: This service lets Red Apps make a single service call or multiple, consecutive requests sharing the same Sabre Red Workspace Sabre session.
- A SRWRuntime locking service: This service is implemented when sending multiple, consecutive requests through the Sabre GDS or Web Services.
- Listening to Sabre emulator requests or responses, either before or after they are sent to the emulator

New Sabre Red Workspace offers more ways of improving and enhancing agent work. Workflow Extension allows to inject custom logic with possibility to invoke user interface elements like form or pop-up. You can find a list of available extension points in main documentation.

Red App Application Services and APIs

The Sabre Red Workspace Developer Toolkit provides a comprehensive set of traditional OSGi

services and other non-traditional plug-in services (APIs) that you can use for optimizing your development. Key services include the following:

- **Agent Profile Service:** This service retrieves information about an agent who is logged in to Sabre Red Workspace and the agent's Sabre session. The information includes EPR, PCC, language, country, e-mail, etc.
- **ConfigService:** This is a central plug-in service that stores properties from different Red App plug-ins. This service provides a convenient API to read the properties efficiently.
- **Logger Services:** A central plug-in service that provides logging services for Red Apps.
- **Agent Work Area:** This service retrieves agent Sabre host work area data.
- **Encode/Decode service:** This service encodes or decodes text for a specified category.
- **Internationalization/i18n**
- **Access to Resources in a plug-in:** This service consists of Java methods for obtaining local resources, such as files or images, that are encapsulated inside a plug-in.
- **Unpack and Copy Resources:** This service automatically unpacks and copies files from your plug-in to Sabre Red Workspace for Red App websites that are run locally, and not from a JAR.
- **First run actions and long-running operations in a plug-in.**
- **Single Sign On API :** Sabre provides vendor-agnostic services that Red Apps can use to validate user access to their server side services so that those applications no longer need to host SSO software on their web servers. Sabre SSO services perform SAML generation and validation where Sabre Red Workspace (with its user authentication mechanisms) is acting as Identity Provider.
- **New Sabre Red Workspace offers even more services:**
 - getPNR
 - Refresh Trip Summary
 - Profile Prefs Refresh
 - SrwApi
 - SrwAsyncApi

Resources in the Developer Toolkit

The Sabre Red Workspace Developer Toolkit provides all the resources that you need to make it all possible when it comes to building Sabre Red Apps.

The main features include:

- Development using the Eclipse Integrated Development Environment with the Red App target platform. The target platform includes the complete code base to develop and test Red Apps locally from your development environment.

First you set up a workspace for your Red App project, your Red App target platform, and a run configuration that lets you launch Sabre Red Workspace in development mode. This enables you to

run the sample plug-ins and test your code. With these tools, you develop and manage your integrated Red App project.

Later you will access CERT or PROD Red Workspace during the certification and testing phase of your Red App. This access is based on Sabre's approval.

- Integrated Red App wizards. These wizards enable you to easily evolve and wrap existing applications, such as websites, Sabre Scribe scripts, and other types of apps as "Red Apps," and then plug the apps into the Workspace, or to create basic Red App projects that automate complex tasks by asking you a series of easy-to-answer questions.

Note: After you set up your Red App target platform, you must install the Red App development tools to access the Red App wizards!

- JavaDocs for specific services and APIs.
- Sample Red App plug-in projects, including source code, to demonstrate all the capabilities of the Developer Toolkit that developers can reuse and reference to get started.
- Main Documentation contains detailed information about SDK, samples and Getting Started with Red Apps. This document includes all the procedures you need to set up your Red App target platform with a run configuration, and to install the Red App development tools that access the Red App wizards and help. Procedures for upgrading a new version of the Toolkit and other maintenance procedures using Eclipse are also included.

What Skills Do Red App Developers Need?

Sabre Red App Certified Developers are required to have the following skills and expertise to develop plug-ins and clients for Sabre Red Workspace:

- Knowledge of the Sabre Red Workspace client, the technologies that the client is built upon, and the APIs that the client provides
- Java programming
- Web technologies
- Development using the Eclipse IDE
- Knowledge of extension points, OSGi services, and APIs, if you are developing plug-ins that use Eclipse RCP functionality created by Sabre

Note: The technology that you choose will dictate the skill set that you need. The preceding list describes the recommended skills for Sabre Red App Certified Developers who want to build advanced Red Apps using Java and the most sophisticated capabilities in the Sabre Red Workspace Developer Toolkit.

It is not necessary for developers to know about the server-side components in Sabre Red Workspace to integrate or implement an existing application into it.

Additionally, Red App Certified Developers creating Red Apps that use cardholder or personal data are required to have the following knowledge and skills, and to conform to these requirements when designing and developing Red Apps:

- Developers must be knowledgeable in secure coding techniques such as [OWASP](#).
- The development of Red Apps must be based on secure coding guidelines to prevent common coding vulnerabilities in the software development process.

Developers must comply with all laws, including applicable data privacy laws and regulations governing the collection, storage, and use of user data.

Sabre Red Workspace Developer Toolkit Support

The Sabre Red Workspace Developer Toolkit was designed to easily allow you to build Red Apps that run seamlessly inside the Sabre Red Workspace by providing a large set of tools and documentation. If needed, additional support is also provided by [Sabre Technical Support help desk specialists](#).

How Do I Get the Sabre Red Workspace Developer Toolkit?

If you are already a Sabre Red App Certified Provider, register and get started with the *Sabre Dev Studio*. There you'll find the Developer Toolkit and other resources to help you. (https://developer.sabre.com/tools/Red_App/).

If not, simply complete the form to become [Red App Certified Provider](#), and we'll follow up with you soon.

Process for Developing, Purchasing, Provisioning, and Maintaining Red Apps

1. Review this Sabre Red Apps Developer Toolkit Overview for information about Red Apps, the Sabre Red Workspace Developer Toolkit functionality that you can use to build Red Apps.
2. Process details can be found in [Red App Centre Quick Reference](#).
3. Before you apply to become a Sabre Red App Certified Developer, review the security requirements for Red Apps. This information is available in the Sabre Dev Studio. (https://developer.sabre.com/tools/red_app/security)

You must create an idea and proposal for your Red App and submit it to Sabre together with your application. If applicable to your Red App, prepare security documentation to submit with your Red App bundle.

1. Complete and submit an application to become a Sabre Red App Certified Developer. For the

application, go to the Login page on <http://www.sabreredappcentre.com>, and click **Become a Red App Developer**.

2. As part of the application process, submit your proposal for a Red App to Sabre. On the proposal form, select the technologies, communications, services, UI workbench elements, and any security-related content that you intend to use in your Red App.

After you submit your proposal, you cannot change the marketing or customer-facing name of your Red App. Later, when you submit your Red App to Sabre for certification, Sabre verifies that your Red App includes the name and selections on your proposal.

1. After Sabre approves your application and Red App proposal, and after you and Sabre agree on commercial and legal terms, Sabre does the following:
 - Sends you a notification with your Sabre ID and PCC.
 - Sends you a unique Red App ID

Note: Retain your Red App ID. You use this ID in your Red App plug-in project and when you submit your Red App bundle for certification, approval, and testing. You also use your Red App ID whenever you submit a failed bundle during the certification phase or a patch release.

The following topics explain the use of your Sabre ID and PCC.

A Certification (CERT) Sabre ID and PCC grants the following access:

- Sabre Red Workspace in development mode, which you launch from Eclipse IDE. From Red Workspace, use your CERT login credentials in Sabre emulator to log in to the CERT environment of the Sabre GDS. You can also change environments and use your Production (PROD) credentials to log in to PROD.
- The CERT environments of Sabre Red Workspace and the Sabre GDS from Sabre emulator. You will install and access CERT Red Workspace when Sabre asks you to test your Red App in CERT.

A PRODUCTION (PROD) Sabre ID and PCC grants the following access:

- The PROD environments of Sabre Red Workspace and the Sabre GDS from Sabre emulator. You will install and access PROD when Sabre asks you to test your Red App in PROD.
- *Agency eServices* (<http://eservices.sabre.com>)
- *Sabre Red App Centre* (www.sabreredappcentre.com).

Sabre has resources about working in the Sabre GDS. Some especially important resources are the following:

- *Working in the CERT System* explains how to change partitions CERT refreshes in the Sabre GDS. When you get your PROD Sabre ID, you can obtain this document on [Agency eServices](#).
- *Format Finder* is a reference of Sabre host formats. When you get your PROD Sabre ID, you can log in to *Format Finder* directly on <http://format-finder.sabre.com>.
- For more information and troubleshooting, see the Red App Developer FAQs in the main documentation.
- Both Getting Started with Red Apps and the Red App help also have a "Red App Resources" topic.

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1. Download and install the Sabre Red Workspace Developer Toolkit.
 - Getting Started paragraph in main documentation has all instructions to install and set up your development environment.
 - Obtain and install all required software and tools. See the topic "Required Developer Software, Tools, and IDs" in Getting Started with Red Apps.
 - Within Eclipse, set up your Red App target platform and a run configuration.
 - Within Eclipse, install the Red App development tools. This integrates the Red App wizards and Red App developer help into your workspace in Eclipse IDE.
 2. In the Red App help, review all Red App requirements and standards. Scan the books and topics that relate to the functionality you are including in your app. The Red App help is organized by functionality. Other topics describe important requirements, the sample plug-ins and wizards, and more.
 3. Review the security requirements for Red Apps. Check these requirements before you code and submit your Red App for periodic updates. You can review these requirements on [Dev Studio](#).
 4. Design your custom application using the technologies, services, communications, UI workbench elements, and PCI or personal data that you selected in your proposal.
 5. Code your app. Add the functionality, communications, authentication, authorization, and registration in your app, as needed.
 6. Obtain a digital certificate from a certificate authority that Sabre supports for Code Signing. These are listed in documentation.
 7. Test your Red App by launching Sabre Red Workspace in development mode from Eclipse IDE.
 8. Prepare use cases for all functionality in your Red App and marketing artifacts before submitting your Red App on the *Red App Centre*.
 9. If applicable to your Red App, prepare security documentation to submit with your Red App bundle.
 10. Create your Red App bundle ZIP file by using the Red App Export Bundle wizard.
 11. Validate your generated bundle by following the recommended steps included in the "Validating your Red App Bundle" Chapter of the Developer documentation.
 12. On the Red App Centre, submit a first Red App release bundle as version 1.0.0.date-timestamp qualifier to Sabre.
 13. After you upload your Red App bundle, Sabre enables it in your CERT environment of Sabre Red Workspace, and asks you to test your Red App in CERT.
 14. If CERT Sabre Red Workspace is not installed on your local machine, install it.
 - [Installer for Windows](#).
 - [Installer for MacOS](#).
 15. Test your Red App in the CERT environments of Sabre Red Workspace, the Sabre GDS, or Sabre emulator.
 16. If your Red App meets your acceptance criteria in CERT, click to post your CERT test results on the Red App Centre. Posting your test results sends verification to Sabre.
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17. After you finish your acceptance test, Sabre begins the process for validating and certifying your Red App.

Identify beta testers who will test your Red App in PROD.

If Sabre certifies your app, you will be asked to: provide from one to five PCC_IDs of beta customers who will test your Red App in PROD Red Workspace when the time arrives for actual testing in PROD. Beta customers do not test in CERT.

Sabre loads your Red App to PROD Red Workspace and provisions it to you and your beta customers in PROD.

1. Download and install PROD Sabre Red Workspace. The URL for PROD Sabre Red Workspace installation is on the Red App Centre.
2. Test your Red App in the PROD environments of Sabre Red Workspace and the Sabre GDS or Sabre emulator. Collaborate with beta customers to test your Red App.
3. If your Red App meets your acceptance criteria in PROD, click to post PROD test results on the Red App Centre. Confirm that the beta customers accepted your beta app. When you provide testing results on the Red App Centre, this sends verification to Sabre.

After you mark PROD testing as passed, Sabre removes the Red App from the beta customers, while retaining the Red App in your Red Workspace. If your beta customers want to use your Red App, they must purchase it on the Sabre Red App Centre.

Sabre publishes your Red App on the Market Centre as is, and notifies you that your Red App is listed for sale.

1. Agency customers shop for and contact your company's purchase contact on record to purchase your Red App.
2. You or your purchase contact work with the buyer to agree to the total purchase price. You also obtain the PCCs and Sabre IDs to receive your Red App.
3. Confirm the sale on the Red App Centre, and specify the end-users who are to receive the Red App and the total purchase price.
4. The buyer approves the purchase. You or your purchase contact invoice the buyer for the full purchase price and collect payment from the buyer.
5. Sabre invoices your company according to your revenue share agreement, and provisions the Red App to the entitled users.
6. The agency administrator in the purchasing agency uses the Sabre Red Workspace Agency Administrator Tools to enable your Red App for entitled users.
7. If your Red App does not meet your expectations in CERT or PROD, mark that the test failed on the Red App Centre.
8. Sabre will ask you to resolve the failure in your Red App. Correct the problem. At a minimum, change the date-timestamp qualifier (part 4) of the original version number and submit your bundle to Sabre again. Sabre executes the same approval process and notifies you when you can test again in CERT or PROD.

Each version of a Red App bundle that you submit must have a different version number.

1. After your Red App is published, it is likely that you will update it. You can develop and submit a new version as either a patch or an upgrade release. A patch is a bug fix and an upgrade has new or improved functionality. An upgrade is considered to be a new product, in other words, a new Red App.

Review Red App version standards and release types again in the Red App help to ensure that your updated version number complies with Sabre's requirements.

For an upgrade to a Red App, you must submit a new proposal and provide a new name for your Red App. If Sabre approves your upgrade proposal, Sabre assigns a new Red App ID.

For a patch, correct your Red App and submit it again with a new version. When you submit a patch, you can change the description of your Red App, the launch type, and you can also provide new screen captures of your app.

1. Sabre repeats the validation and certification process. If Sabre certifies your upgrade or patch release, the following occurs:
 - For a patch release, you must test your Red App in CERT and PROD again. Based on certification by Sabre, Sabre publishes the patch to the Market Centre and all existing users of the patch release receive the patch release automatically. The Agency Administrator in the purchasing agency uses the Sabre Red Workspace Agency Administrator Tools to enable your Red App for entitled users.
 - You do not confirm a sale for a patch release. All existing users receive the patch release automatically.
 - For an upgrade release, you repeat the process of testing in both CERT and PROD, following the same process as for a new Red App. Sabre publishes your Red App in the Market Centre. After you confirm a sale in the Red App Centre, you specify which end-users are to receive the new upgrade on the Red App Centre, and then Sabre entitles your upgraded Red App to the designated customers. End-users of an upgraded Red App may be new or existing users. The Agency Administrator in the purchasing agency uses the Sabre Red Workspace Agency Administrator Tools to enable your Red App for entitled users.
 - The purchase process must be completed before Sabre distributes an upgrade to end-users.

Note: If the support contact information for your Red App changes, you are required to update the contact details in your plug-in. Even if this is the only change you make to a published Red App, you are required to submit a new release with this updated information. It is most likely that this will be a patch release.

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Sabre, Inc.
3150 Sabre Drive
Southlake, TX 76092-2199
(682) 605-1000