
The Great Reading Adventure Documentation

Release 4.0.0-beta2

Maricopa County Library District

Aug 14, 2018

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The Great Reading Adventure is a robust, open source software designed to manage library reading programs. The GRA is free to use, modify, and share. We hope you like it and will consider becoming a part of the community.

The code is open source, and is [available on GitHub](#).

Note: This documentation is currently very incomplete. If you need help, please don't hesitate to contact developers and users on [The Great Reading Adventure Forum](#).

This manual is split into several main sections:

- *Introduction* - What is The Great Reading Adventure? How does it work?
- *Installation* - installing and configuring The Great Reading Adventure software
- *Setup* - setting the software up to work with your reading program(s)
- *Technical Documentation* - technical documentation

The Great Reading Adventure (GRA) is a robust, open source software designed to manage library reading programs. The GRA is free to use, modify, and share. We hope you like it and will consider becoming a part of the community.

The GRA was designed to function on computers, tablets, and mobile phones.

Features include:

1.1 Avatars

Engage participants by letting them put together a customized avatar which can easily be shared via social media. The GRA includes almost 4,500 avatar image assets provided under a [Creative Commons CC0 1.0 Universal License](#) which can be interchanged to create billions of avatar combinations.

1.2 Badges

“Digital Badges are an assessment and credentialing mechanism that is housed and managed online. Badges are designed to make visible and validate learning in both formal and informal settings and hold the potential to help transform where and how learning is valued.” – MacArthur Foundation

Digital badges are a great way to enhance your reading program. They can be used in addition to (or as a replacement for) physical incentive prizes. Digital badges go far beyond the momentary happiness that a toy incentive provides, as they carry with them recognition of achievement, engagement, and personal identity. The Great Reading Adventure makes it easy to create badges for those who participate in library and other community experiences.

Here’s how it works:

- A participant attends a program at your library.
- At the end of the program, you give the participant a secret code for attending.
- The participant enters the secret code into his/her online reading log.

- The participant automatically receives the badge. Our badge wizard makes the process super simple: you just create an event, upload or design a badge, and assign a secret code. It's a great new way to tie the online summer reading program to the events in your bricks-and-mortar locations.

1.3 Challenges

1.4 Drawings

1.5 Events

1.6 Mail

The Mail facility built-in to the software allows you to engage directly with participants. Individual messages can be submitted which can be handled by any number of back-office staff. Messages are shown as a thread in the administration interface to give context to the conversation. Administrators can also send broadcast messages to all participants.

1.7 Participant management

Participants can be managed by front-line or back-office staff from correcting account registration issues to manually adding or removing points, redeeming prizes, and resetting passwords.

1.8 Triggers

1.9 Questionnaires

You put a lot of time and effort into your summer reading program- it's important to know that what you're doing has an impact. The GRA's comprehensive evaluation tools will help you do just that.

With our pre- and post-testing modules, you can deliver an assessment to participants and compare their scores to their activity during the program. The system auto-scores the multiple choice assessments, which gives you all the data with none of the hassles.

The assessment module doubles as a survey tool, so you can simultaneously gather qualitative and quantitative data to tell a more impactful summer reading story.

1.10 Reporting

With The Great Reading Adventure, immediate access to your program's vital statistics is just a click away! At-a-glance stats give you a quick breakdown of registrations and completions and in-depth reporting allows you to drill down into the details.

All reports are exportable to HTML and Excel, putting all the summer reading data you need right at your fingertips.

Planning for initial configuration

2.1 Hosting

As a Web application, the first decision that will need to be made is about hosting. Hosting requirements can be found in the [system requirements](#) section of this manual.

2.1.1 Self-hosting

If your organization has the proper Windows or Linux server environment that is accessible from the Internet, hosting on your own systems can be an option.

2.1.2 Paid hosting

Various providers are available which can host the GRA for a monthly fee.

2.2 Programs

Setting up multiple programs gives a library system the flexibility to deliver targeted content to varying audiences, while still unified in the same overall campaign. Libraries have the freedom to customize the content of each program, all so that participants can access audience-appropriate activities, badges, and events. Users can self-select which program to enroll in or the system can automatically place them into an age-appropriate program, based on age or school grade.

Setting up multiple programs adds flexibility but increases complexity.

By default in version 4 of the GRA, setting up a single program at the start gives you reading tracking by books (i.e. participants say “I read a book” and get a point). When you select the multi-program initial setup, participants track their reading by minutes read (one minute is one point). You can add and remove programs once you perform the initial setup and you can change whether programs are tracking by books or minutes read.

Creating a **single reading program** is good if you:

- Are targeting a single age group
- Intend to have the same experience for all participants
- Aren't intending to require a literacy test for only some participants

Several age-specific reading programs are better if you:

- Want to report on age groups differently
- Intend to have Badges, Challenges, and Events specific to age groups

2.3 Content

System requirements

The GRA requires the following services to run. These services may all be hosted on the same machine or may be hosted on separate machines for performance reasons.

3.1 Runtime environment

Version 4 of the GRA runs in the [Microsoft .NET Core 1.1](#) runtime environment. Downloads of the runtime environment are available from Microsoft for the following operating systems:

- macOS
- Linux (CentOS, Debian, Fedora, openSUSE, Ubuntu)
- Windows (x64 and x86)

As of this writing the latest release of the .NET Core 1.1 environment is [Runtime v1.1.7](#). Please ensure you use a v1.1.x Hosting Bundle!

3.2 Web server

Microsoft recommends that ASP.NET Core 1.1 applications are run behind an Apache, nginx, or IIS reverse proxy.

- To host with IIS, [Windows Server 2008 R2 or later](#) is supported.
- Note that currently GRA reporting utilizes Web Sockets and requires IIS 8 and Windows Server 2012.
- To host with [Apache](#) or [Nginx](#), a version of Linux which supports .NET Core 1.1 should be selected (see above).

3.3 Database server

The GRA version 4 supports the following database environments:

- Microsoft SQL Server 2008 or later using SQL Server authentication mode

3.4 Mail server

The ability to send Internet email, such as a service which accepts email via SMTP.

- The GRA sends mail in certain instances (such as helping users recover their lost passwords) and requires the ability to connect to an SMTP server.

4.1 Configuration information you'll need

4.1.1 Configuration step 1: database configuration

- Database server name or IP address
- Database/catalog name
- Database owner user login (the user in the `db_owner` role)
- Database owner user password

4.1.2 Configuration step 2: mail server configuration

- The administrator's email address - you may want to set up a role address ahead of time so that system emails don't appear to come from your personal address
- Mail server - SMTP server to handle emails
- Mail server port (optional) - by default 25 will be used
- Mail server login (optional) - if you need to authenticate to send email
- Mail server password (optional)

4.1.3 Configuration step 3: select an initial program configuration

Your final decision is which initial program configuration to choose:

- You can opt to set up with a single reading program that **tracks by books read**
- You can opt to set up with four age-specific reading programs that **track by minutes read**

Once you set up in either configuration you can add or remove programs as you see fit.

For more information on these options, please review the [planning section](#) of this manual.

4.2 Hosting in a Windows environment

- Ensure you have a Windows server running **Windows Server 2008 or newer**
- Note that for reporting to work you must be running **Windows Server 2012/IIS 8 or later with Web Sockets enabled**
- Ensure your server has the **.NET Core Runtime 1.1.x Hosting Bundle** installed
- Confirm that you can **create a new Web site in IIS** on this server
- Confirm that you will be permitted to configure it so that **Web site files can be writable by the Windows user who owns the IIS process (typically the IIS_IUSRS group or DefaultAppPool user)**.
- Ensure you have access to a **Microsoft SQL Server version 2008 or newer**
- Ensure that you'll be able to authenticate in **SQL Server authentication mode**
- Confirm that you'll be able to **create a database**
- Ensure that you have a **mail server with an accessible SMTP port or the ability to deliver mail from a service running on the Web server**
- The **latest release of the GRA software** downloaded from GitHub.
-

Create the database

The GRA uses its own database to store reading program data. This database can be completely segregated from any other databases on the same SQL Server.

There are two options when creating the database: you can execute a script or manually create the database and users using [SQL Server Management Studio \(SSMS\)](#).

5.1 From a script

1. Connect to the database server to run a query (this can be done with SQL Server Management Studio by right-clicking on the server in the Object Explorer on the left and choosing **New Query**).
2. Copy the text from the [database create script](#) and paste it into the query window.
3. Click the **Execute** button in the toolbar.

5.2 From the user interface

5.2.1 Create the database

1. Launch SQL Server Management Studio and connect to the database server.
2. Double-click the server name to show the **Databases** folder.
3. Right-click on the **Databases** folder and select the **New Database...** option.
4. In the New Database window, enter a database name, for example: `SRP`.
5. If you wish to have the database files stored in a [different location than the default](#), scroll the **Database files** list to the right and change the presented **Path** to where you'd like to store the database files.
6. Select **Options** from the page list on the left.
7. For the **Recovery model** drop-down, change the selection from `Full` to `Simple`.

8. Select **OK** to create the database.

5.2.2 Create the logins and users

1. Right-click the **Security** folder and select **New -> Login...**
2. Enter the **Login name** for the database owner user, for example: `srp_owner`.
3. Select `SQL Server authentication`.
4. Enter a secure password for this user in the **Password** and **Confirm password** fields. Make a note of this password.
5. You can uncheck `Enforce password policy` so that the password for this account will not expire.
6. Select `User mapping` from the **Select a page** list on the left.
7. Locate the name of the database (this tutorial used `SRP` in *Create the database* step 4 above) in the **Users mapped to this login** list on the left.
8. Check the appropriate box in the `Map` column to map this login to a user in the database.
9. In the **Database role membership for:** list, select `db_owner`.
10. Select **OK** to create the login and user.

Initial configuration for version 4 of The Great Reading Adventure involves setting up database connection information and the initial signup authorization code.

You can edit the `appsettings.json` file that comes with The Great Reading Adventure version 4 or you can create a new `appsettings.json` file that overrides the built-in application settings and place it in the shared directory under your GRA installation.

The critical settings to update are the “SqlServer” setting under “ConnectionStrings” and the “GraInitialAuthCode” setting.

Please note: Application settings are configured in a JSON or “JavaScript Object Notation” file. This file can be edited with any text editor (such as `notepad.exe`) but must be in a specific format. You can find validators online which will help you ensure that the syntax of the file is correct. Also note that when a backslash (`\`) or double quote (`"`) appears within quotes (for example in the database password) it must be escaped, meaning a backslash should appear prior to the escaped character (e.g. `\\` or `\"`).

6.1 Connection string

```
"ConnectionStrings": {  
  "SqlServer": "Server=<servername>;Database=<databasename>;user id=<username>;  
  ↳password=<password>;MultipleActiveResultSets=true"  
},
```

In the above example you'd replace the following:

- `<servername>` - Hostname or IP address of your SQL Server
- `<databasename>` - Name of the SQL Server database
- `<username>` - SQL Server login to use
- `<password>` - SQL Server password to use

For password generation, please consider using a utility like `pwgen` in a Linux environment or something similar to the [online Diceware password generator](#).

6.2 Authorization code

```
"GraInitialAuthCode": "<authorizationcode>"
```

This is the code that you will use when you set up your account to grant you full access to Mission Control (the administrative interface) of the software. Please change this value to ensure that people who come across your site cannot grant themselves full administrator access!

6.2.1 Sample configuration override file

If you wish to override the `appsettings.json` file rather than edit the file that comes packaged with the GRA, you'll make a file called `appsettings.json` in the shared directory under your GRA installation. The contents of that file should be similar to this (see above for how to change the configuration values):

```
{
  "ConnectionStrings": {
    "SqlServer": "Server=<servername>;Database=<databasename>;user id=<username>;
  ↳password=<password>;MultipleActiveResultSets=true"
  },
  "GraInitialAuthCode": "<authorizationcode>"
}
```

Install the software on a Windows Server

The final installation step is to create a Web site and install the GRA software.

The hosting Windows Server should have IIS installed and the Web Sockets feature enabled. You do not need to install Windows Authentication.

Also, ensure the server has the proper .NET Core 1.1.x Hosting Bundle installed.

7.1 Set up the GRA as the only site on the server

If this Web server is configured solely for the Great Reading Adventure, you can utilize the default Web site for your GRA installation.

1. Delete existing default files placed in `c:\inetpub\wwwroot\` such as `iisstart.htm` and `welcome.png`.
2. Unzip the GRA files into `c:\inetpub\wwwroot\`. Ensure that the files are placed in that directory directly and not in a subdirectory (you should see files such as `appsettings.json` and `GRA.dll` present).
3. Create a new folder named `shared` in `c:\inetpub\wwwroot`.
4. Right-click on the `c:\inetpub\wwwroot\shared` directory and select **Properties**.
5. Choose the **Security** tab and then click the **Edit** button next to *To change permissions, click Edit*.
6. If you don't see the `IIS_IUSRS` group listed, select **Add** in the **Permissions for wwwroot** window and in the **Enter the object names to select** box, enter in `IIS_IUSRS` and click **OK** (the `IIS_IUSRS` group is a local group on this machine, so ensure that the **From this location** box has the name of the Web server and not your domain - you can change this by clicking **Locations...** and select the server). You may also use an [AppPoolIdentity](#) account instead of the `IIS_IUSRS` group for security reasons.
7. Ensure all the checkboxes (including **Modify**) are selected except **Full control** and **Special permissions** in the **Allow** column.
8. Select **OK** to close this window and **OK** to close the **wwwroot Properties** window.

9. Ensure you have updated the configuration in the `appsettings.json` file - or if you are using a configuration override file, ensure it's named `appsettings.json` and placed into the shared folder. See the [configuration section of this document](#) for more details.
10. Launch a Web browser on the server and navigate to the URL `http://localhost/`.
11. At this point you should see the initial GRA setup screen.
12. You can continue the GRA setup process either directly in this Web browser or you can navigate to the Web server name or IP address in a browser on another system to continue.

7.2 Set up the GRA as an additional site on the server

If you are deploying the Great Reading Adventure to a Web server which is already hosting one or more Web sites, you must create a new Web Site specifically for the GRA.

Because this Web server is already serving out files through the default Web Site, you must differentiate your GRA Web site somehow. Methods for doing so include:

- Setting up a separate host name for your GRA Web site (for example: `http://gra.<your domain>`). This method utilizes the [HTTP/1.1. Host Header Field](#).
- Setting up a separate IP address on the Web server and putting your GRA site there.
- Setting up the GRA on a different port number so that you'll access it via `http://<your Web server>:<GRA port>/`.

Your system administrator can help you select the correct approach.

1. Create a directory on the Web server to contain the GRA files. For example, `c:\inetpub\gra`.
2. Unzip the GRA files into that directory. Ensure that the files are placed in that directory directly and not in a subdirectory (you should see files such as `appsettings.json` and `GRA.dll` present).
3. Right-click on directory created in step 1 above and select **Properties**.
4. Choose the **Security** tab and then click the **Edit** button next to *To change permissions, click Edit*.
5. If you don't see the `IIS_IUSRS` group listed, select **Add** in the **Permissions for ...** window and in the **Enter the object names to select** box, enter in `IIS_IUSRS` and click **OK** (the `IIS_IUSRS` group is a local group on this machine, so ensure that the **From this location** box has the name of the Web server and not your domain - you can change this by clicking **Locations...** and select the server). You may also [use an AppPoolIdentity account instead of the IIS_IUSRS group](#) for security reasons.
6. Ensure all the checkboxes (including **Modify**) are selected except **Full control** and **Special permissions** in the **Allow** column.
7. Select **OK** to close this window and **OK** to close the **Properties** window.
8. Ensure you have updated the configuration in the `appsettings.json` file - or if you are using a configuration override file, ensure it's named `appsettings.json` and placed into the shared folder. See the [configuration section of this document](#) for more details.
9. Open up the **Internet Information Services Manager** on the Web server.
10. Expand the Server under **Connections**.
11. Right-click on **Sites** and choose **Add Web Site...**
12. Enter an appropriate site name such as `SummerReading`.
13. Enter the physical path where you put the GRA files under **Physical path** (we used `c:\inetpub\gra` above).

14. In the **Binding** section you will either need to assign an IP address, a host name, or select a different port as defined above.
15. Select **OK** to close the **Add Web Site** window.
16. Launch a Web browser on the server and navigate to the URL you defined for this install of the GRA.
17. At this point you should see the initial GRA setup screen.
18. You can continue the GRA setup process either directly in this Web browser or you can navigate to the Web server using the URL you defined for this install of the GRA.

7.3 Troubleshooting a Windows installation

1. Did you modify the `appsettings.json` or provide an override file in the `settings` directory to configure the database connection and authorization code?
2. Did you install the .NET Core 1.1.x Hosting Bundle?
3. Did you restart IIS after installing it?
4. Are you sure the `shared` directory has write permissions for the process running IIS? Once the application starts, it will create a “logs” directory there so you will know if the Web server can write to this directory once you see the “logs” directory present. Check that “logs” directory to see if there are any errors written out to the log file.
5. If the Web process can write to the `shared` directory, you can edit the `Web.config` file `aspNetCore` tag to set `stdoutLogEnabled="true"` and `stdoutLogFile=".\\shared\\stdout"`. When you restart IIS it should write a log file starting with “stdout” that you can examine to see if any errors are being written to it.
6. Microsoft’s [Troubleshoot ASP.NET Core on IIS](#) page will walk you through some typical troubleshooting steps.

Setting up your administrator account

Once you can access your installation of the software, it's time to set up the initial administrator account. To do this, you'll need the initial Authorization Code (configured as `GraInitialAuthCode`) that you put into the `appsettings.json` file.

8.1 Joining with an Authorization Code

1. Visit `/Join/AuthorizationCode/` in your installation
2. Supply the Authorization Code specified as `GraInitialAuthCode` in your configuration file
3. Once you've completed the process you'll be able to click the rocket in the navigation bar at the top to access Mission Control

8.2 Joining with a regular account

1. Select the "Join" link or visit `/Join/` in your installation.
2. Complete the process to create your account.
3. Visit `/MissionControl/` in your installation
4. Supply the Authorization Code specified as `GraInitialAuthCode` in your configuration file
5. The system will grant you full rights and place you in Mission Control

Adding avatars

Artwork from the game [Glitch](#) was made freely available under a [Creative Commons CC0 1.0 Universal License](#) license (essentially a “no rights reserved” license). The artwork used to create in-game characters has been adapted to work with The Great Reading Adventure as the participant’s avatar.

The following outline how to download the artwork and incorporate it into your Great Reading Adventure installation to use as avatars.

1. Obtain the `defaultavatars.zip` file from the [GRA release page](#).
2. Unzip the avatars and place them into a directory called `assets` in your main deployment directory (the `assets` directory will be alongside files like `appsettings.json` and `GRA.dll`). Inside the `assets` directory will be the `defaultavatars` directory which will contain all the element directories and installation `.json` files (folders like `Body` and `Hat`, files like `default avatars.json` and `default bundles.json`).
3. Optional: when participants share their avatars via Open Graph markup or Twitter Cards their avatar is placed upon a stage to make it better fit into the image sizes necessary for Open Graph and Twitter: the file named `background.png` will be used as that stage. There are other options in the `backgrounds` folder - if you would like to use one of those just rename the one you select `background.png` and overwrite the current `background.png` file.
4. Access Mission Control on your installation.
5. Choose the picture frame icon from the navigation menu and select “Avatars”.
6. Click the “Add default avatars” button.
7. Wait. This takes a while - it may take so long that the Web page itself times out. If you want to see the progress, look in the `shared/logs` directory on your server, it should output as it’s importing the various items. You’ll see “Default avatars added in *x* seconds.” in the log file when it is done.
8. Navigate through the avatar section of the software and ensure that all of the available assets are agreeable for your program(s) and audience.

Application Settings

ASP.NET Core can check several locations for configuration settings. It checks the following places in order:

1. `appsettings.json` in the deployed application directory (where the `GRA.dll` and `GRA.Web.dll` files are)
2. `shared/appsettings.json` in the deployed application directory - settings in this file override any settings in the top level `appsettings.json` file
3. Environment variables - any configured environment variables are passed into the software. If you don't wish to put sensitive information (such as your configuration string) into a file in the application directory you can configure those items via environment settings.

The majority of the software configuration occurs in the `appsettings.json` file which is a JSON-formatted configuration file.

10.1 Connection strings

One connection string is required (either `SqlServer` or `SQLite`).

- `SqlServer` - A SQL Server connection string
- `SQLite` - SQLite connection information (typically the path to the SQLite database file)
- `SqlServerSessions` - *optional* - A SQL Server connection string for storing session data in a SQL Server database (necessary for multiple Web servers answering requests for the same site)

10.2 General settings

- `GraConnectionStringName` - which connection string to use (either `SqlServer` or `SQLite`)
- `GraInitialAuthCode` - the Authorization Code entered to grant users full access to the site - **it's important that the default is not kept here**

- `GraInitialProgramSetup` - *optional* - defaults to “multiple” which creates four age-based programs and sets up a point translation of one minute read equals one point, can also be set to “single” which creates one program and sets up a point translation of one book read equals one point
- `GraRollingLogPath` - defaults to “shared/logs”, a path to save a daily-rotating log file - if `GraInstanceName` is specified in `appsettings.json` it will be included in the log file name
- `GraCulture` - *optional* - defaults to “en-US”, the culture to use for displaying things like dates and times - for valid options see the language tags listed in the Microsoft [National Language Support \(NLS\) API Reference](#)

10.3 Default settings

These settings are used when the program runs for the first time to insert some reasonable defaults into the database. All of these settings are optional. All of these settings can be configured in the Site Settings area of Mission Control.

- `GraDefaultSiteName` - defaults to “The Great Reading Adventure”, what the site refers to itself as
- `GraDefaultPageTitle` - defaults to “Great Reading Adventure”, set in many page titles
- `GraDefaultSitePath` - defaults to “gra”, this is used for tenancy (which is not implemented yet)
- `GraDefaultFooter` - the footer output on every web page
- `GraDefaultOutgoingMailHost` - the hostname or IP address of the outgoing mail server
- `GraDefaultOutgoingMailLogin` - login name for the mail server (if needed)
- `GraDefaultOutgoingMailPassword` - password for the mail server (if needed)
- `GraDefaultOutgoingMailPort` - defaults to “25”, port to connect to for relaying SMTP emails

10.4 Static file settings

- `GraContentDirectory` - defaults to “content/shared”, the path to the shared content files for this instance of the application
- `GraContentPath` - defaults to “content”, the URL path to the files in the `GraContentDirectory` (e.g. by default accessing `/content/` with your Web browser serves files off the disk from the `content/shared` directory)

10.5 Settings for multiple front-end deployments

- `GraDataProtectionPath` - defaults to “shared/dataprotection”, location to save the [data protection key](#)
- `GraApplicationDiscriminator` - defaults to “gra”, application discriminator to use for data protection
- `GraInstanceName` - the name of this deployed instance

10.6 Logging with Serilog

Customization can be done to the way Serilog works by adding a “Serilog” section to the log file. For example, logging to Slack can be added by putting the following configuration section in (and replacing `<webhook URI>` with the actual [Slack incoming webhook URI](#)):

```
"Serilog": {
  "MinimumLevel": "Debug",
  "Enrich": [ "FromLogContext" ],
  "WriteTo": [
    {
      "Name": "Slack",
      "Args": {
        "webhookUri": "<webhook URI>",
        "restrictedToMinimumLevel": "Warning"
      }
    }
  ]
}
```

More information about customizing Serilog in appsettings.json can be found in the [serilog-settings-configuration project on GitHub](#).

11.1 The Great Reading Adventure

The Great Reading Adventure was initially developed by the [Maricopa County Library District](#) with support by the [Arizona State Library, Archives and Public Records](#), a division of the Secretary of State, with federal funds from the [Institute of Museum and Library Services](#).

The Great Reading Adventure source code is distributed under [The MIT License](#).

11.2 This manual

11.2.1 Colophon

The content of this manual is part of the [open-source project on GitHub](#). It is generated using the following tools and technologies:

- [reStructuredText](#) and [CommonMark](#) (a fork of [Markdown](#)) text markup languages.
- [Sphinx](#) generates the manual from source files.
- [GitHub](#) provides version control and source code management.
- [Read The Docs](#) generates and hosts the online manual in [PDF](#) and [HTML](#) formats.

11.2.2 Contributors

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