HRE –AUXILIARY (NON-DATABASE) FILE OVERVIEW

Revision history

2018-06-01	Robin Lamacraft	Original draft
2018-06-25	Don Ferguson	Revised throughout and added detail of how/when files created, and their content.
2018-10-16	Nils Tolleshaug	User authentication for remote server access
2019-03-07	Don Ferguson	Minor edits to tighten language/definitions
2019-04-23	Don Ferguson	Minor revisions and alignment with document *03.32.01*
2020-01-19	Don Ferguson	Clarified various components throughout
2020-07-19	Don Ferguson	Aligned with Build 22 status
2021-03-15	Don Ferguson	Aligned with Build 25 status

SCOPE

HRE is an application that may be considered to be in 2 parts; an HRE Client process and an HRE Server process. The GUI is controlled by the HRE Client process and makes requests to the HRE Server process(es). The Server's processes' main functions are to update HRE Project databases.

In the simplest model the HRE Client and Server processes are being executed in the same computer (the 'local' case). In the other case the Server processes are executing on another computer that may be in the same location or be accessed by internet communications (the 'remote' case). When the Client and Server processes are executing in the same computer HRE is a single-user at a time configuration. When the Server and Client are not running in the same computer then more than one user can operate on a HRE project at the same time.

A Client process may access several HRE Projects that are served by different physical computers (local or remote). To be able to access a number of different Servers the Client process needs to maintain information about which Project is served by a particular Server and the communication path to the Server.
Likewise, a Server needs to maintain information on which Clients can access a project and whether they are currently doing so.

To provide the required functionality for the above scenarios, the HRE system requires the use of auxiliary (non-database) files.

AUXILIARY (NON-DATABASE) FILES

There are 2 possible types of auxiliary (AUX) files – one aligned to each HRE User and one aligned to each Project database.

NB: as of HRE Build 0022 the need for Project Auxiliary files has not eventuated. At this stage there is no intent to implement them, but this documentation is retained in case they become essential. Following references to ProjectAUX files should be read with this disclaimer in mind.

Each may hold specific information, also divided into 2 groups. Their layouts may be described at a high-level as follows:

UserAUX File
User related information, such as: • User preferences • Accessibility data (vision, motor action, etc) • Main screen size/shape

ProjectAUX File
Project related information, such as: • Project name, location • Associated data folders (external, e.g., for image files, etc • other data as may be required.

• other data as may be required. Project related information (per Project): • Project name, database filename, location • " • other data as may be required.	User related information, such as: • Username, email address, language, last access • " • other data as may be required.

Basic Concepts and Rules

1. The AUX files need to be stored at a known file path in the appropriate computer
2. To maintain flexibility in possible content the files will be in XML format
3. Every installation of HRE, regardless of where databases will eventually reside, MUST have 1 local database (the 'Seed' database)
4. All Users who have opened an HRE database will always have a local UserAUX file with a list of projects successfully connected to
5. As per rule 3, remote Servers must also have had an HRE installation and a 'Seed' database installed. This is essential, as the only way to create a project database with its corresponding AUX Database file is to run HRE on that server.

CREATION OF AUX FILES

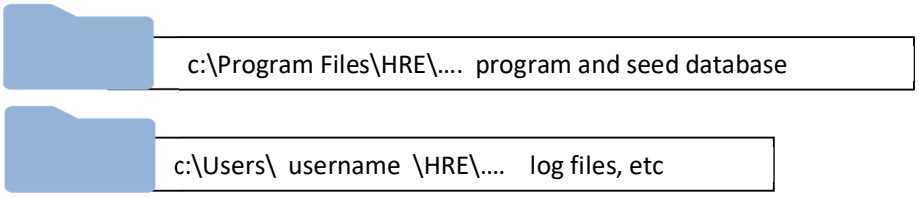
This section describes an initial HRE install and identifies the various steps that must take place to ensure the creation and population of the required data in the AUX files through the use of the HRE ProjectNew, ProjectOpen and ProjectAdmin routines.

First Installation of HRE

Assume we start with the first install of HRE on a computer (we will use the Windows environment for this explanation, but equivalent processes must take place for Linux and Mac machines).

The program is installed into C:\Program Files\HRE\……
A 'Seed' database is also installed with the program (over time there may be multiple types of seed databases made available to users). This Seed database has basic preloaded data that ensures the integrity of the database indexes, etc.

HRE INSTALLATION FILES



First Use of HRE

There are 3 possibilities:

- User wishes to create a new Project on this computer (so User chooses Project New)
- User wishes to connect to a pre-existing remote project created by the administrator of a remote Server, who has supplied appropriate login/connection information (so User chooses Project Open)
- There is a local project database (created by a previous user of HRE on this or another computer) so the User chooses Project Open.

First use of GUI_ProjectNew

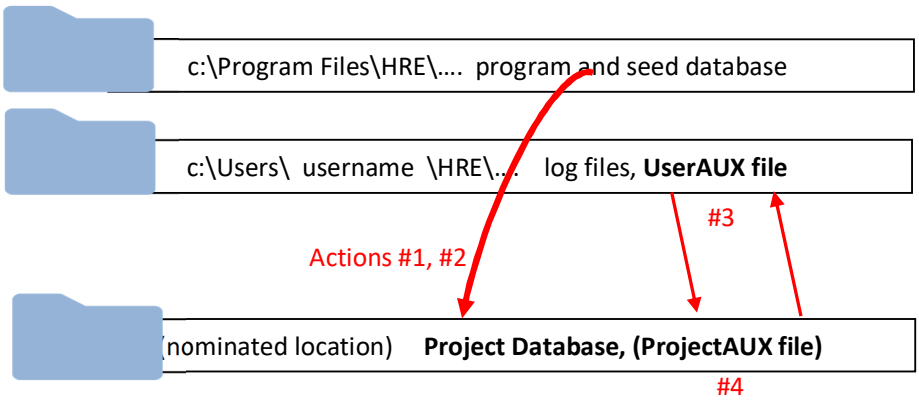
This routine creates a new HRE database (and project) from the 'Seed' database supplied during installation and creates the required AUX files.

NB: if the user wished to create a new project using his or her own starting data (pre-defined sources, repositories, events, roles, and so on), they would use ProjectCopyAs applied to their own starter database, thus creating a new project/database.

The user first needs to select the folder in which the new database/project is to reside (which may be an internal or external local device or mapped NAS server).
When the location is chosen, ProjectNew then:

1. copies the Seed database to the chosen location with the requested filename
2. initialises the Project within the database with the requested project name (which may be different from the database filename)
3. if it doesn't already exist, creates the UserAUX file in C:\Users\username\HRE\…. or opens it if it does exist. In both cases, add the project info to this AUX file (project name, database filename, location, etc) and any other required data
4. creates the ProjectAUX file in the same location as the new database file, and populates it with the Project and User data (also supplied by the User)
5. opens the Project and checks the User table for the presence of any Users. If and only if there are none, then add this User to the project with full administrative rights.

HRE FILES AFTER FIRST USE OF PROJECTNEW



NB: this representation is the same for both a local database/project and the setup of a project on a remote server by the server Admin, as the database/project is 'local' to the Admin.

NB: a User may not attempt to create a new project on a remote (IP addressed) server – this must be executed on the server itself by an administrator using the local HRE installation. Once created, the administrator can then advise the User how to access the database and the remote User would use Project Open with the information supplied by the project administrator.

Use of ProjectOpen

There are three possible scenarios:

1. Any Project; has been opened previously by this User: we are opening a project already known to this User, based on data in the UserAUX file. If there is only 1 project in the UserAUX file, the project should be automatically opened without requesting further input. Otherwise, the User is presented with a list of all Projects from the UserAUX file and can

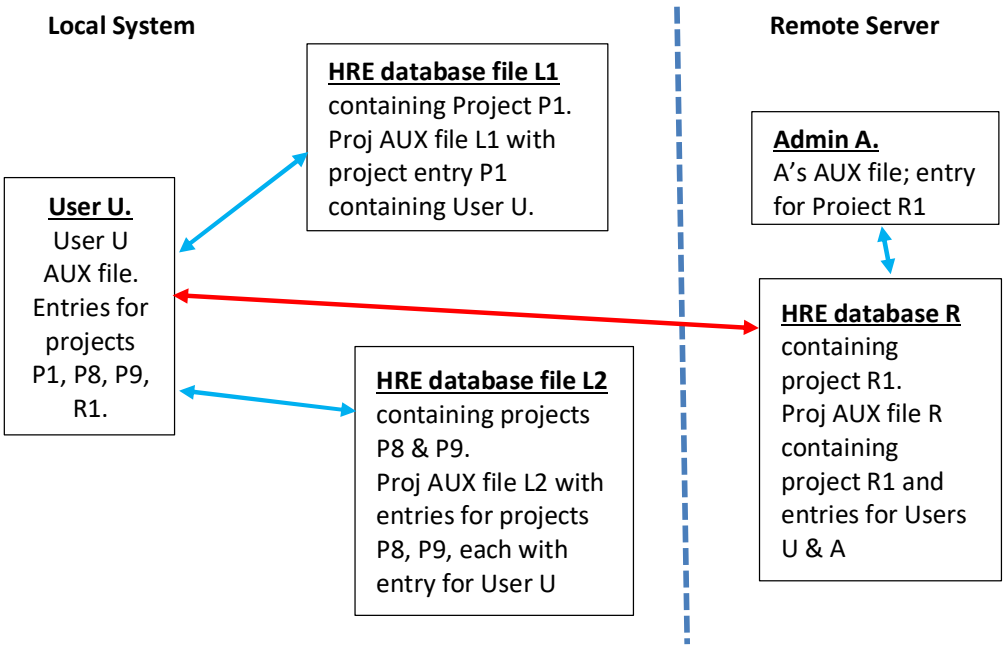
then choose the one to open. Selecting a project should immediately open that project, whether local or remote (subject, for remote projects to the required server login process)

2. Local Project; not yet used by this User: this covers the situation of there being a Project on this computer originally created by some other user of the same computer, OR the importation of a project from some other system, OR the possible case of the UserAUX file having been deleted (and needing to be re-created).
   The User may browse (using the OS file explorer) to find such a local project database file, previously not used by this User, but resident on this computer. If a local file is found and selected, ProjectOpen creates the UserAUX file (if one does not exist), adds the project to the UserAUX file, and adds this User to the ProjectAUX file. However, as this User will NOT be in the project's User tables, the User must be added into the project with full administrative rights, regardless of the User rights already present – this is 'safe' in this case only, as this is a local project.
   The User should also be requested to use ProjectAdmin to edit the project User tables to remove any other registered users, if that is applicable
3. Remote Project, not used by this User: if this is a first-time use of this remote project the User must have been told how to access the remote server, the database and project names and the Username the remote Server administrator has setup for him to use, and this Username and rights must have been added into the project User tables already by the administrator.
   If the User has connected to this remote project from a different computer, the connection details will need to be added to this User's UserAUX file, from when access will then work, as his details will already be stored in the ProjectAUX file and project User tables.
   In either case, if connection is successful, then open the project.

Accordingly, the ProjectOpen module has to adapt to each of these modes. Connection to local projects requires no login capability but accessing remote shared projects does require user authentication. To achieve this, the ServerLogin module as described in *09.01 CC_RemoteServerConnection* has to provide user authentication and the business rules including appropriate warning and error messages to control these aspects.

Finally, on Open, the routine should populate the UserAUX file with default settings for a new project, then overlay these with the User's personal settings from this User's last use of this project (if there was one).

AUX FILE CONNECTIONS WITH MULTIPLE LOCAL AND ONE REMOTE PROJECT
(Local connections shown in blue, Remote connection in red)



On Subsequent HRE Startup

As HRE has been used before, there is now project history (i.e., there has been at least one previous Project Open and Project data exists in the UserAUX file). It is thus possible to use Project Open to select the project the User wishes to open (as above in option 1).

USE OF USERAUX FILE DATA

All access to the UserAUX file is provided through the HB0744UserAUX module.
Many of the HRE routines make use of data from the User Auxiliary file - for these and other purposes, data 'collected' from the initial opening and reading of the UserAUX file is stored in variables in the HGlobal routine for reference. Any change to these variables requires immediate update of the UserAUX file through use of HB0744UserAUX.

RECOVERY FROM USERAUX FILE LOSS

Loss of the UserAUX file is not catastrophic, but will inhibit the User's access to projects they have previously used. If the User opens a Project they have previously used, the UserAUX file will be re-created, as this is the same as a new User opening an existing project for the first time – however, usage settings and details of other projects will be unknown until each project is manually located and re-opened.
The possible recovery methods are thus:

1) Restore of the UserAUX file from a backup copy, if available
2) Recreation and rebuilding of the individual Project content through re-opening each project. This would require the User to obtain the relevant details (logonID, password) for any remote server access that they had previously been provided with
3) Building the UserAUX file from project log entries. This function could only be done by an administrator with full access to the project log files. The process is undefined but would involve interpretation of the User's project interactions e.g., the log entry for a User opening the project proves they previously had access and thus should create an entry for that project in the UserAUX file, and so on.

USERAUX FILE RECORD FORMAT

UserAUX files are saved in XML format. The following defines the XML structure and the fields defined. Further data may be recorded as HRE is built, without this specification necessarily being updated each time.
In the following, items in (*italicised*) are comments on the initial content, NOT actual entries.

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<userauxfile>
  <buildno>0.00.0022</buildno>
  <user>
    <username>username of user</username>
    <preferences>
      <guiLang>en</guiLang>
      <showsplash>true</showsplash>
      <showcancelmsg>true</showcancelmsg>
      <showvpproject>false</showvpproject>
      <openlastproject>false</openlastproject>
      <writelogs>true</writelogs>
    </preferences>
    <visible>
      <guifont>Arial</guifont>
```

```
      <dateformat>dd Mmm yyyy</dateformat>
      <timeformat>HH:mm:ss.msec</timeformat>
      <tableheadfill>82c8ff</tableheadfill>
      <tableheadfont>000000</tableheadfont>
    </visible>
    <misc>
      <lastusedfolder>C:\Users\username of user\HRE</lastusedfolder>
      <lastprojectclosed>project name</lastprojectclosed>
    </misc>
    <locations>
      <mainmenux>936</mainmenux>
      <mainmenuy>275</mainmenuy>
      <mainmenuh>700</mainmenuh>
      <mainmenuw>1200</mainmenuw>
    </locations>
    <visible>
      <guifont>Arial</guifont>
      <tableheadfill>82c8ff</tableheadfill>
      <tableheadfont>000000</tableheadfont>
    </visible>
    <servers>
      <server name="user's computername">
        <logonid>NA</logonid>
        <rights>ALL</rights>
      </server>
    </servers>
  </user>
  <projects>
    <project name="HRE Sample project">
      <filename>HRE Sample database</filename>
      <foldername>~/HRE/</foldername>
      <servername> user's computername </servername>
      <lastclosed>2020-07-01 / 12:00:00</lastclosed>
      <dbtype>H2</dbtype>
    </project>
  </projects>
</userauxfile>
```

USE OF PROJECTAUX FILE DATA

All access to the ProjectAUX file may be provided through the HB0745ProjectAUX module.
Many of the HRE routines make use of data from the Project Auxiliary file - for these and other purposes, data 'collected' from reading the ProjectAUX file may be stored in variables in the HGlobal routine for reference. Any change to these variables requires immediate update of the ProjectAUX file through use of HB0745ProjectAUX.

PROJECTAUX FILE RECORD FORMAT

ProjectAUX files will be saved in XML format. The following defines the XML structure and the fields defined. Further data may be recorded as HRE is built (if ProjectAUX files are used) without this specification necessarily being updated each time.
In the following, items in (*italicised*) are comments on the initial content, NOT actual entries.

```
<?xml version = "1.0" encoding="UTF-8” standalone="no"?>
<projectauxfile>
  <projects>
        <project>
                <project name="Sample">
                <filename>HRE Sample database</filename>
                <foldername>~/HRE/</foldername>
                <servername> (user’s or server’s computername) </servername>
                <lastclosed>2020-01-01 / 12:00:00</lastclosed>
                <dbtype>H2</dbtype>
                <externals>path to external data</externals>
                <users>
                        <user name="username">
                        <email> (email address) </email>
                        <language> (default language) </language>
                        <lastaccess> (date of last use) </lastaccess>
                        </user>
                </users>
        </project>
        (Note that further Project entries are possible if the database file contains more than one
project)
   </projects>
</projectauxfile>
```