CSWeb User's Guide

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International Programs
Population Division
U.S. Census Bureau

4600 Silver Hill Road
Washington, DC 20233

cspro@lists.census.gov

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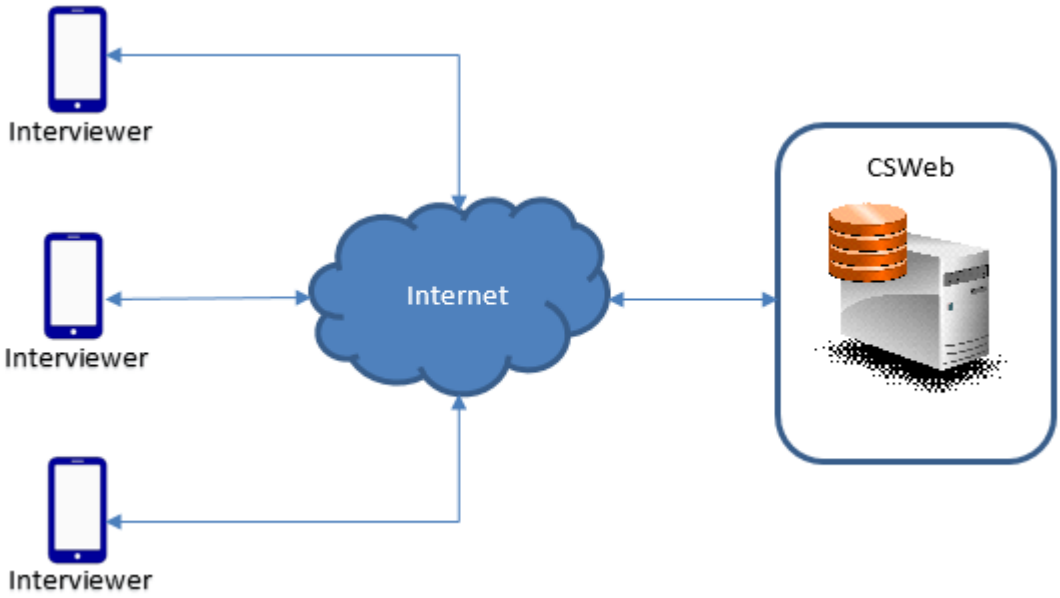
CSWeb User's Guide

Introduction to CSWeb

CSWeb is a web application that allows users to securely transfer cases (questionnaires) or files between client devices running CSEntry and a web server. CSWeb requires a web server running PHP and MySQL.



Direct synchronization between interviewers and central server over the Internet

CSWeb eliminates the need to transfer data files by allowing users to instead transfer cases between client devices and a web server. CSEntry data entry applications that are configured to use CSWeb synchronization take advantage of *Smart Synchronization*, a feature that transfers only cases that are added or modified since the last successful synchronization. Smart Synchronization reduces data transfer costs and Internet bandwidth usage.

CSWeb uses a MySQL database on the server to store the cases for the census or survey data entry instrument. Unlike a file based synchronization that requires application designers to manage the concatenation of data files, CSWeb allows users to download a single file containing all the cases for the data entry instrument (once the cases are transferred from the client devices to the server).

The code to run CSWeb can be downloaded from the CSPro download webpage. More information about how to use CSPro's synchronization features can be found in the CSPro User's Guide Synchronization Overview.

CSWeb is intended for large surveys and censuses. For small and medium surveys, Dropbox or FTP syncrhonization is sufficient and far simpler to setup than CSWeb. For Dropbox synchroniation, no server is required at all, making it very easy to get started. In addition, setting up CSWeb requires knowledge and experience with server administration and website technologies. If you do not have experience setting up and maintaining web servers, you will find setting up CSWeb to be very difficult.

This guide contains the following information:

Server Setup

- Minimum Server Requirements
- Apache Server Setup
- Apache CSWeb Setup

- IIS Server Setup
- IIS CSWeb Setup
- Running CSWeb in Production

How to ...

- Accessing Data
- Troubleshooting
- Get Help

Server Setup

Minimum Server Requirements

Below are the minimum requirements to run CSWeb on an Apache or IIS server.

Manually verify:

- **Apache 2.0** or above or **IIS** 7.0 or above
- URL Rewrite Module enabled

Requirements that will be verified by setup script:

- MySQL 5.5.3 or greater
- PHP 5.5 or above
- **Settings in php.ini**
    - enable_post_data_reading on
    - post_max_size=8M
    - **Extensions in php.ini**
        - extension=php_curl.dll
        - or allow_url_fopen=On
        - extension=php_fileinfo.dll
        - extension=php_openssl.dll
        - extension=php_pdo_mysql.dll
        - extension=php_pdo.dll
        - extension=php_zip.dll (necessary with some installations of PHP)
- **Guzzle** (PHP HTTP client) one of the following must be true
    - PHP 5.6 or above
    - or extension=php_curl.dll
    - or The CA bundle is installed
- **Files directory**
    - Must exist and be writeable

The above requriements are sufficient to set up a CSWeb server for testing. To use CSWeb for a production data collection operation see Running CSWeb in Production.

Apache

Apache Server Setup

The setup of an Apache server is beyond the scope of this document. Fortunately, there already exists an extensive amount of documentation on the topic. Below we have provided links for getting started.

Web Development Environment

There are a number of different web development environments that will simplify the setup and allow you to run and test CSWeb locally. If you are developing using Windows you may find WampServer helpful. It will install and configure Apache, MySQL, and PHP.

Apache Server

If you are looking to setup a server to host CSWeb you will need to install and configure Apache, MySQL, and PHP.

URL Rewrite Module

Regardless of your setup the Apache **rewrite_module** must be enabled. To do this you will need to edit the **httpd.conf** file. There may be multiple copies of this file on your computer. Once, you have located the file make a back up and then uncomment the following line **LoadModule rewrite_module modules/mod_rewrite.so**. Then restart Apache.

Apache CSWeb Setup

Below we have provided a general overview of the steps required to run CSWeb on an Apache server. In this example, it is assumed WampServer has been installed and configured.

Add Project Files

Copy the **root directory** of your CSWeb project to **<Drive>:\wamp64\www**. The result may look like **C:\wamp64\www\csweb**. Note that with Apache, the case of the folder name matters. **CSWeb** and **csweb** will require different URLs to access the server. For simplicity, we recommend using all lowercase e.g. **csweb**.

Start Apache and MySQL

Make sure Apache and MySQL are running.

Add Database

Add a new database to use for CSWeb using the MySQL command line, MySQL workbench, or phpMyAdmin. Create a user with access to the new database. For security reasons the database user should have a corresponding password.

Run Setup Script

Open a browser and in our case navigate to **localhost/csweb/setup**. The setup script will first check to make sure your server meets the prerequisites. If your server does not pass, refer to the Minimum Server Requirements. Update your server and run the script again. If your server passed the script will ask for the last few configuration details.

1. **Database name**: the name of the database you created earlier.
2. **Hostname**: this will typically be **localhost**.
3. **Database username**: by default this will be **root**.
4. **Database password**: by default this may be **blank**. Do not use the default password for a live server.
5. **CSWeb admin password**: create a password to pair with the default user **admin** to log into CSWeb.

Now verify the final two fields.

1. **Path to files directory**: for this setup, **C:\wamp64\www\csweb\files**
2. **CSWeb API URL**: for this setup, **http://localhost/csweb/api**

If everything is correct you will hit next and receive the "Setup Complete!" message. From here log in using **admin** as the username and the **CSWeb admin password** you just created. Once you have run the setup script you will **not** be able to run it again unless you delete **src\api\app\config.php** and **src\ui\src\config.php**.

IIS

IIS Server Setup

Below are the prerequisites for setting up an IIS server.

Install Internet Information Services (IIS)

On the lefthand column of **Programs and Features** select **Turn Windows features on or off**. Here you are able to select the check box to turn on **Internet Information Services**.

Install Microsoft Web Platform Installer 5.0

You will find a shortcut to run the ISS Manager under **Administrative Tools**. On the righthand column of the **IIS Manager** click **Get New Web Platform components**. This will open a browser where you will be able to download the installer for Microsoft's web installer.

Install PHP 5.5+

Once installed, you can launch Microsoft's web installer from within the **IIS Manager** by clicking **Get New Web Platform components**. Select the **Products** tab and install PHP 5.5 or above. Note that in Windows 10 the PHP Manager for IIS may fail to install. You can ignore this message.

Handle Additional Verbs

In the **IIS Manager** select the **Features View** and then double click **Handler Mappings**. Right-click on **PHP_via_FastCGI** and select **edit**. Click **Request Restrictions...**, select the **Verbs** tab, select **One of the following verbs** and enter **GET,HEAD,POST,PUT,PATCH,DELETE,OPTIONS**. You may then be prompted to double quote the path under **Executable**.

Install URL Rewrite Module

Microsoft's web installer will also install the **URL Rewrite** module. However, if you use another installation method you may need to install it manually. You can verify whether it is installed or not in IIS Manager's **Features View**. For more information and to download the URL Rewrite module click here.

Edit php.ini

Locate the php.ini file for the new installation of PHP. You may have multiple copies on your computer. The default install path will be under **Program Files (x86)** or **Program Files** depending one whether you installed the 32 or 64 bit version. The root of the install directory will be **PHP**. You will find the php.ini file in the subdirectory that was named for the **version** you installed. Open **php.ini** with Notepad and search for **[ExtensionList]**. Copy and paste **extension=php_fileinfo.dll** on the next line. Save and close the file.

Install MySQL Server 5.5.3+

Download the MySQL Server here. For help with installation see the documentation. Do not forget to start the server. If you installed MySQL Server as a service you can start it by doing the following:

1. Win + R
2. Run services.msc
3. Right-click on MySQLXX
4. Start

Alternatively, if you did not install MySQL server as a service or have a web development environment like WampServer installed, you can start MySQL Server from the command line. You will need to open a command prompt and change directory to the directory that contains **mysqld.exe**.

```
> mysqld
```

IIS CSWeb Setup

Below are the prerequisites for running CSWeb on an IIS server.

Add Project Files

Copy the **root directory** of your CSWeb project to **<Drive>:\inetpub\wwwroot**. The result may look like **C:\inetpub\wwwroot\csweb**.

Update Directory Permissions

You will find the below directories in your document root. Their permissions will need to be updated as shown.

- **files**: Read and Write
- **logs**: Read and Write
- **var**: Read and Write
- **src\api\app**: Read and Write
- **src\ui\src**: Read and Write

Let us use the **files** directory as an example. Right-click on **files** and select **Properties**. Then click the **Security** tab. Press the **Add...** button and type **IUSR** under **Enter the names to select**. Press the **Check Names** button and confirm your changes. Select the user name you just added, **IUSR**, then update the permissions under **Permissions for IUSR** so that **Read** and **Write** are allowed. Now repeat this process for **logs**, **var**, **src\api\app**, and **src\ui\src** setting the correct permissions.

Add Database

Do not forget to start the server. If you installed MySQL Server as a service you can start it by doing the following:

1. Win + R
2. Run services.msc
3. Right-click on MySQLXX
4. Start

Alternatively, if you did not install MySQL server as a service or have a web development environment like WampServer installed, you can start MySQL Server from the command line. You will need to open a command prompt and change directory to the directory that contains **mysqld.exe**.

```
> mysqld
```

Next, you can use MySQL Monitor to add a database. Connect to MySQL Server. You will need to open a command prompt and change directory to the directory that contains **mysql.exe**.

```
> mysql -u root -p
```

Now, add the database.

```
> create database <name-of-your-database>;
```

As an example, I have named my database **cspro**.

```
> create database cspro;
```

To verify our work, we can list the databases.

```
> show databases;
```

If you would prefer not to use the command line we recommend MySQL Workbench.

Start IIS

If IIS is installed you will find the **Internet Information Services (IIS) Manager** shortcut under **Administrative Tools** in the **Control Panel**. Double click the shortcut to launch the IIS Manager. In the **Connections** tree on the left-hand side expand **Sites** and select **Default Web Site**. You will see your document root below this. On the right-hand side there is an **Actions** panel. Under **Manage Website** click **Start**.

Run Setup Script

Open a browser and in our case navigate to **localhost/csweb/setup**. The setup script will first check to make sure your server meets the prerequisites. If your server does not pass, refer to the Minimum Server Requirements. Update your server and run the script again. If your server passed the script will ask for the last few configuration details.

1. **Database name**: the name of the database you created earlier.
2. **Hostname**: this will typically be **localhost**.
3. **Database username**: by default this will be **root**. This is created during the installation of the MySQL Server.
4. **Database password**: by default this may be is **blank**. Using the default password is a security issue. This is set during the installation of the MySQL Server.
5. **CSWeb admin password**: create a password to pair with the default user **admin** to log into the web app.

Now verify the final two fields.

1. **Path to files directory**: for this setup, **C:\inetpub\wwwroot\csweb\files**
2. **CSWeb API URL**: for this setup, **http://localhost/csweb/api**

If everything is correct you will hit next and receive the "Setup Complete!" message. From here log in using **admin** as the username and the **CSWeb admin password** you just created. Once you have run the setup script you will **not** be able to run it again unless you delete **src\api\app\config.php** and **src\ui\src\config.php**.

Upgrading

Upgrading from Previous Versions

If you already have an older version CSWeb installed on your server and you want to upgrade to a newer version of CSWeb follow the steps below:

Backup Existing Data

While the upgrade should normally preserve any existing data in your database, to be extra safe, you should first backup any data that has been syncd to the server. Download each of the data files on the server to a csdb file. See Accessing Data for instructions on how to download the data.

Update Project Files

Download and unzip the CSWeb source code and copy it to the csweb directory on your server. The csweb directory is where you originally copied the project files to during doing the initial installation. For example, for wampserver it would likely be **C:\wamp64\www\csweb**. The new files will overwrite the files from the original installation.

Start Apache and MySQL

Make sure Apache and MySQL are running.

Run Upgrade Script

When upgrading CSWeb, the database schema may change to support new features. In addition to updating the project files, you need to run the upgrade script to migrate the database to the new structure. Open a browser and browse to **csweb/upgrade**. For example, if you have installed on localhost then navigate to **http://localhost/csweb/upgrade**. The upgrade script will check to see if the database needs to be migrated. If it does, it will display an **Upgrade** button. Click this button to start the migration.

If everything is correct you will receive the "Upgrade Complete!" message. From here log in to CSWeb as usual.

Production

Running CSWeb in Production

Using CSWeb for a production data collection operation requires additional steps in order to make the server accessible to devices in the field and to ensure proper data security.

Domain name

In order to connect to the server from devices outside your local network, such as tablets in the field, you will need to register a domain name for your server. The instructions in this document describe using http://localhost to access your CSWeb server. This will only work when accessing CSWeb from the server itself. In order to access the server from a tablet or another computer you will need domain name such as http://census.gov. There are many companies online that can register domain names. If you already have a website then you may be able to use that domain, or a subdomain, for your CSWeb server.

Network security

If your server is connected to the internet, it is important to ensure that you have network security systems in place to prevent unwanted intrusion and access to your data. Such systems will generally include a firewall. Your firewall must be configured to allow HTTP and/or HTTPS traffic in order for devices to connect to CSWeb over the internet. If you plan to store confidential survey data on your CSWeb server you should seek assistance from an expert in server security.

SSL certificate

TLS/SSL encrypts the communication between your server and devices in the field. TLS/SSL is also known as https. If you use CSWeb without https, passwords and data are transferred as plain text and may be intercepted during transmission. For confidential data it is important to use TLS/SSL to encrypt all data being transferred between devices in field and the server. This can be done easily by configuring the web server (Apache or IIS) to use https instead of http. This requires an SSL certificate for your domain. There are various companies and organizations that can provide SSL certificates.

How to ...

Accessing Data

Download CSPro DB File

1. Navigate to the **Data** tab of CSWeb.
2. Under the **Download** column click the file download icon for the dictionary you want to download.
3. This will download a PFF file. Double click the PFF file to launch the Data Viewer tool.
4. You will be asked to enter your CSWeb username and password.
5. The data will be downloaded as a single CSPro DB file.

Troubleshooting

Troubleshooting Problems

CSWeb logs errors to a **logs/api.log** file located in the CSWeb sources folder in your web server's root directory. This log file has more detailed information to help you troubleshoot problems.

If you need assistance setting up CSWeb or troubleshooting problems, please email cspro@lists.census.gov. Attach to the email any server logs to help the CSPro development team diagnose the problem.

Reconfigure CSWeb

To reconfigure or reset your CSWeb installation:

1. Locate the CSWeb sources folder in your web server's root directory.
2. Delete the files **src/api/app/config.php** and **src/ui/src/config.php**.
3. To reconfigure CSWeb, open your web browser and launch the CSWeb setup page.

Common errors during CSWeb setup

Failed to connect to database. SQLSTATE[HY000] [1045] Access denied for user

The database username and database password are not correct. They should be set to the username and password for a MySQL user that has permissions to access the MySQL database.

Failed to connect to database. SQLSTATE[HY000] [2002] php_network_getaddresses: getaddrinfo failed: No such host is known.

The hostname is incorrect. This should be the hostname for the MySQL database, not the server hostname. In most cases the hostname should be "localhost" unless your database and web server are running on different computers. The hostname should NOT include "http://". If MySQL is running on a different port than the default, you should add the port to the hostname. For example "localhost:3307".

Something went terribly wrong

This is a general error that could be caused by a number of different problems with the CSWeb configuration. For more information check the CSWeb log files and also check the Apache/IIS/PHP error log.

Common errors syncing to CSWeb from a tablet/phone

Failed to connect to localhost

You are using a server URL that uses localhost. Localhost can only be used to access the server from a web browser running on the server itself. To access the server from another computer or device you must use either a domain name or the IP address of the server. If your server does not have a domain name or a static IP address you will need to obtain one. If you are unsure how to do this you may want to consider using Dropbox synchronization instead of CSWeb.

Unable to resolve host

Either the server URL is incorrect or your device is not connected to the network.

Resource not found on server

The server URL is not correct. The host portion of the URL is probably correct but the part that follows is not. This often happens when "ui" is used instead of "api" at the end of the URL. For example, *http://example.org/csweb/ui* instead of *http://example.org/csweb/api*. Always use "api" when syncing with CSWeb from CSPro and use "ui" only when accessing CSWeb from your web browser.

Get Help

To contact the CSPro development team with comments, questions, or to report problems, please contact:

International Programs
Population Division
U.S. Census Bureau

4600 Silver Hill Road
Washington, DC 20233

Phone: +1 301-763-1451

Support email: cspro@lists.census.gov

Official website: www.census.gov/data/software/cspro.html

CSPro Users forum: www.csprousers.org/forum

When you contact us, please mention that you are using **CSPro 7.1.3**.