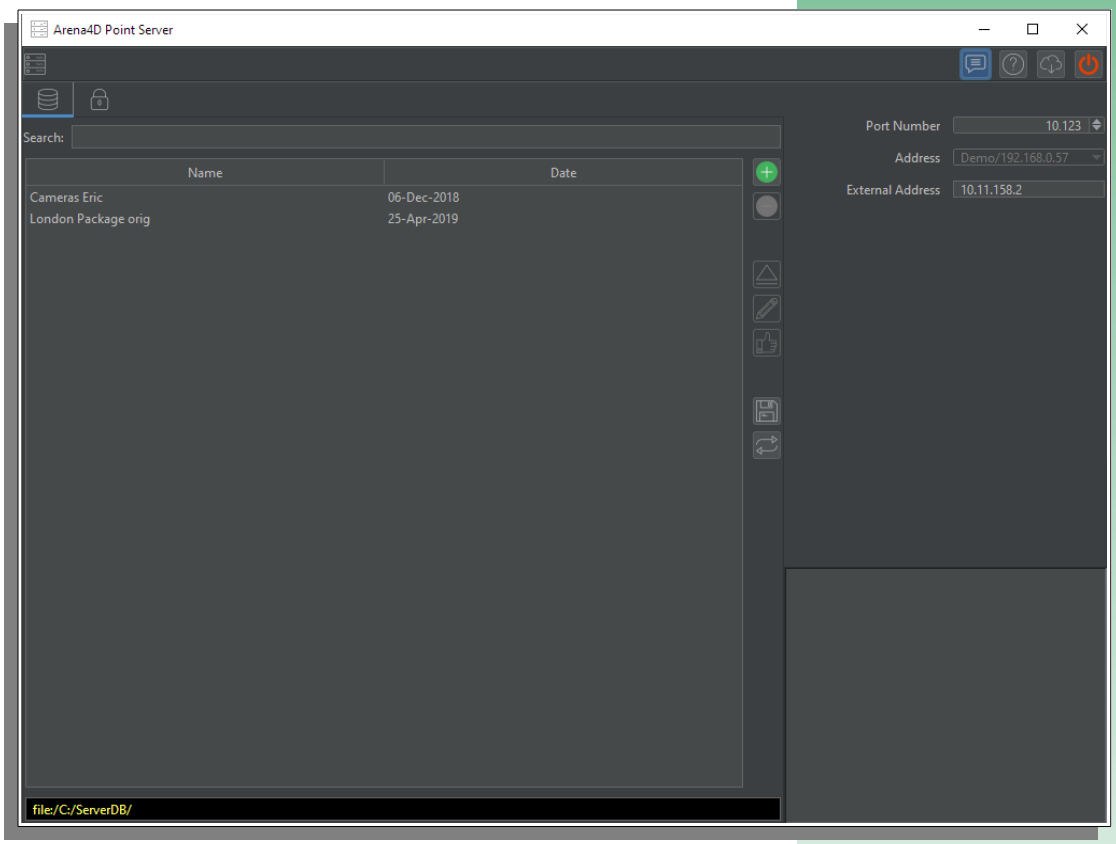
Veesus Arena4D Point Server

User Guide



Veesus Arena4D

Software Version 8.0

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Table of Contents

1 Introduction

1.1 About

Welcome to the User Guide for the Veesus Ltd Arena4D Point Server.

Arena4D Point Server is an HTTP server capable of streaming Veesus Point Cloud (VPC) files across network connections.

This simple solution allows you to share and collaborate easily whilst having all your data securely kept in one central repository.

1.2 Installation

For Windows run the provided installer and follow the onscreen prompts.

1.3 Licensing

Arena4D Point Server requires a valid license to serve more than a single file.

1.4 Data Formats

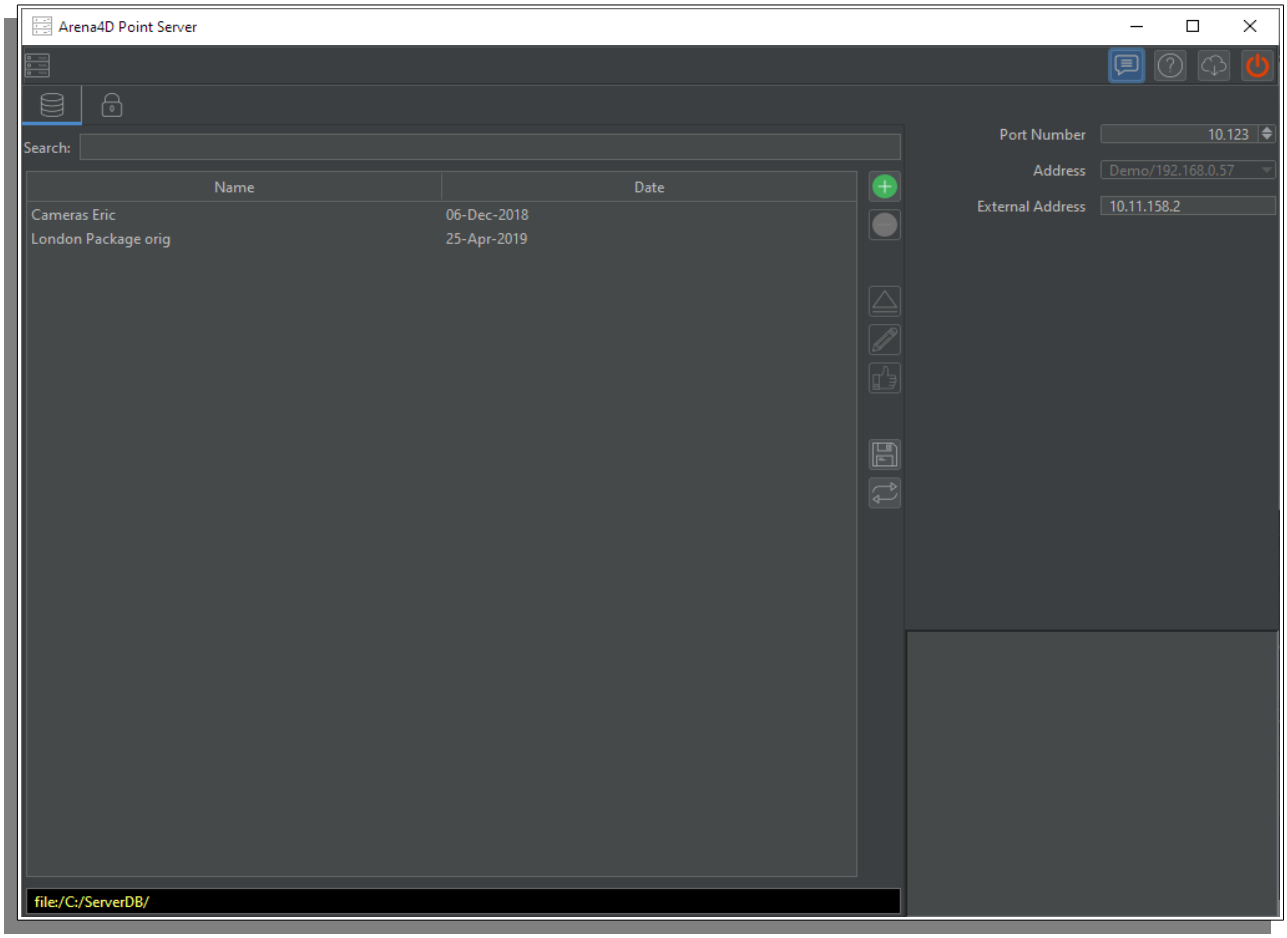
Arena4D Point Server requires Arena4D project files (.a4d). To generate an a4d file download the free version of Arena4D Data Studio from the Veesus website, or use the version supplied on your installation CD and select the “Export” function from the “Explorer” tab. VPC files themselves are supported.

Protected VPC files within .a4d files (protection is applied and removed from the feature provided by Data Studio) are not supported or streamed from the server to protect their contents from malicious intercept.

2 User Interface

2.1 *Administration*

The Administration tab shows what projects are available to be served from the current instance of Arena4D Point Server.



Arena4D Server stores Projects in a special area called a **Repository**. This is a database that is accessible by your current computer, therefore it may be on your local hard drive ***or*** a network area. ***Note:*** *It is strongly recommended that this is on a local drive and preferably an SSD (Solid State Disk) for performance reasons.*

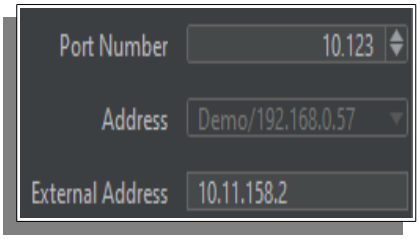
Projects can be managed from the **Administration** tab with the following features:

- **Add** a Project.
- **Remove** a Project.
- **Export** a Project.
- **Rename** a Project.
- **Verify** a Project.
- **Location** repository physical disk location for projects.
- **Refresh** Project List.

2.2 Configuration

There are eleven configurable options in Arena4D Point Server:

2.2.1 Port Number



To Change the default network port number to stream data through use the up and down button or simply type the value using the keyboard.

Note: Pay attention not to use a port number being used by another applications or services.

2.2.2 Address

Simply select the IP Address of the server machine from the pull down list. The list comprises of the local IP Address including localhost, but if the address is incorrect due to more that one NIC (Network Interface Card) or using a static IP Address/DDNS (Dynamic Domain Name System) generated elsewhere then see section 2.2.3 External Address for correct configuration. If issues arise at the client also use the external address option.

Note: External address must be blank for this option to be available.

2.2.3 External Address

Used to set the DDNS or IP Address directly using the keyboard in cases where you may have more then one NIC or you are using DDNS for static IP Address association.

2.3 PoTree 

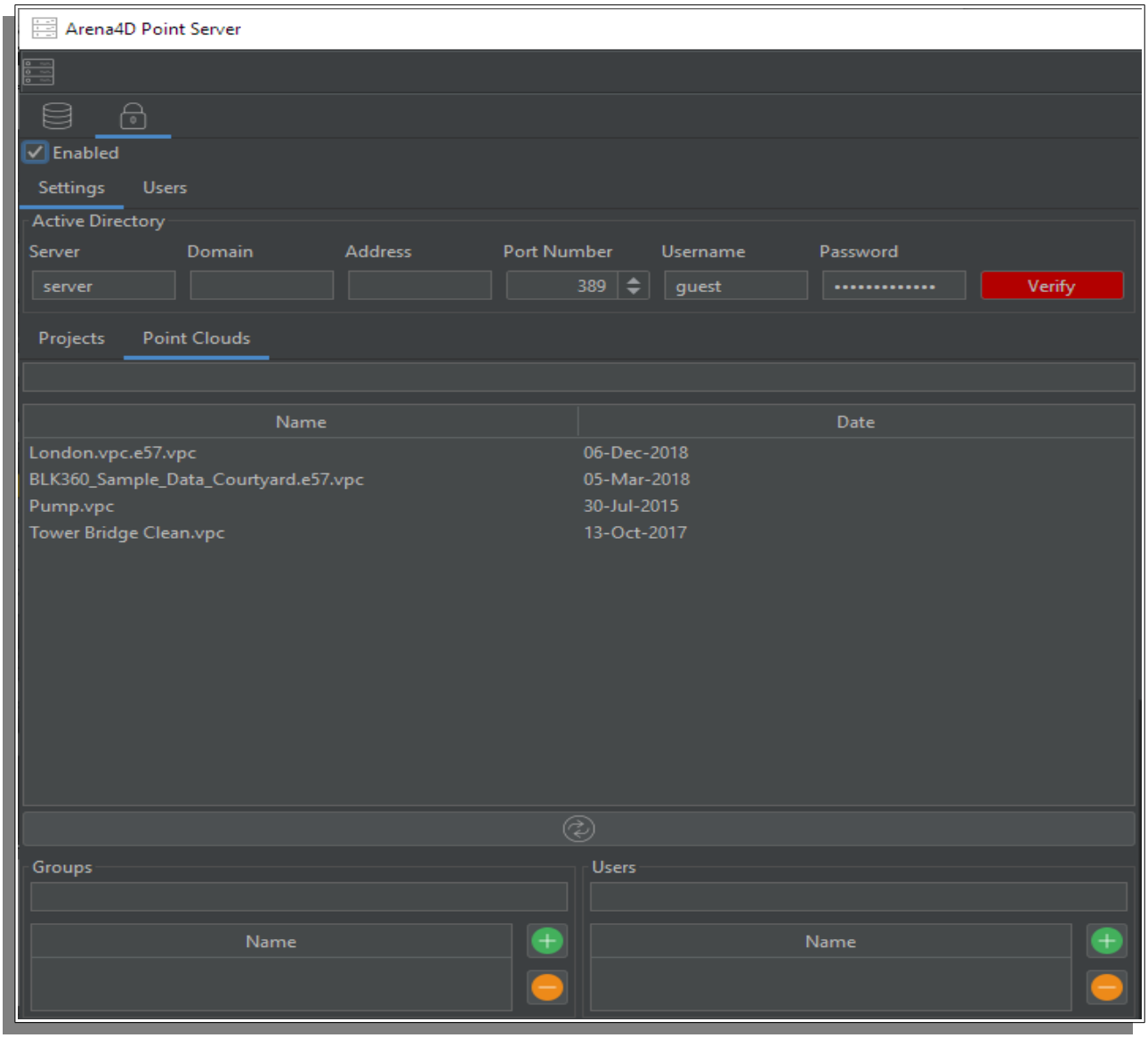
Used to enable/disable available point clouds being displayed within a browser with the url ending in “/web”. Enabled as shown highlighted.

2.3.1 Language 

Server Interface Language can simply be changed by selecting this icon and selecting the language from the presented list.

2.4 Access Control

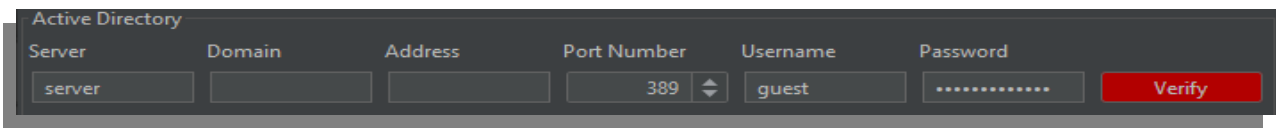
The access control option consists of two tabs, 1) Settings for Active Directory and access control and 2) for non-Active Directory users.



2.4.1 Settings

The settings tab allows the connection to an Active Directory.

Note: address field is only required if running outside the Domain.



Once the Active Directory fields have been entered correctly press 

which will turn green once connected.

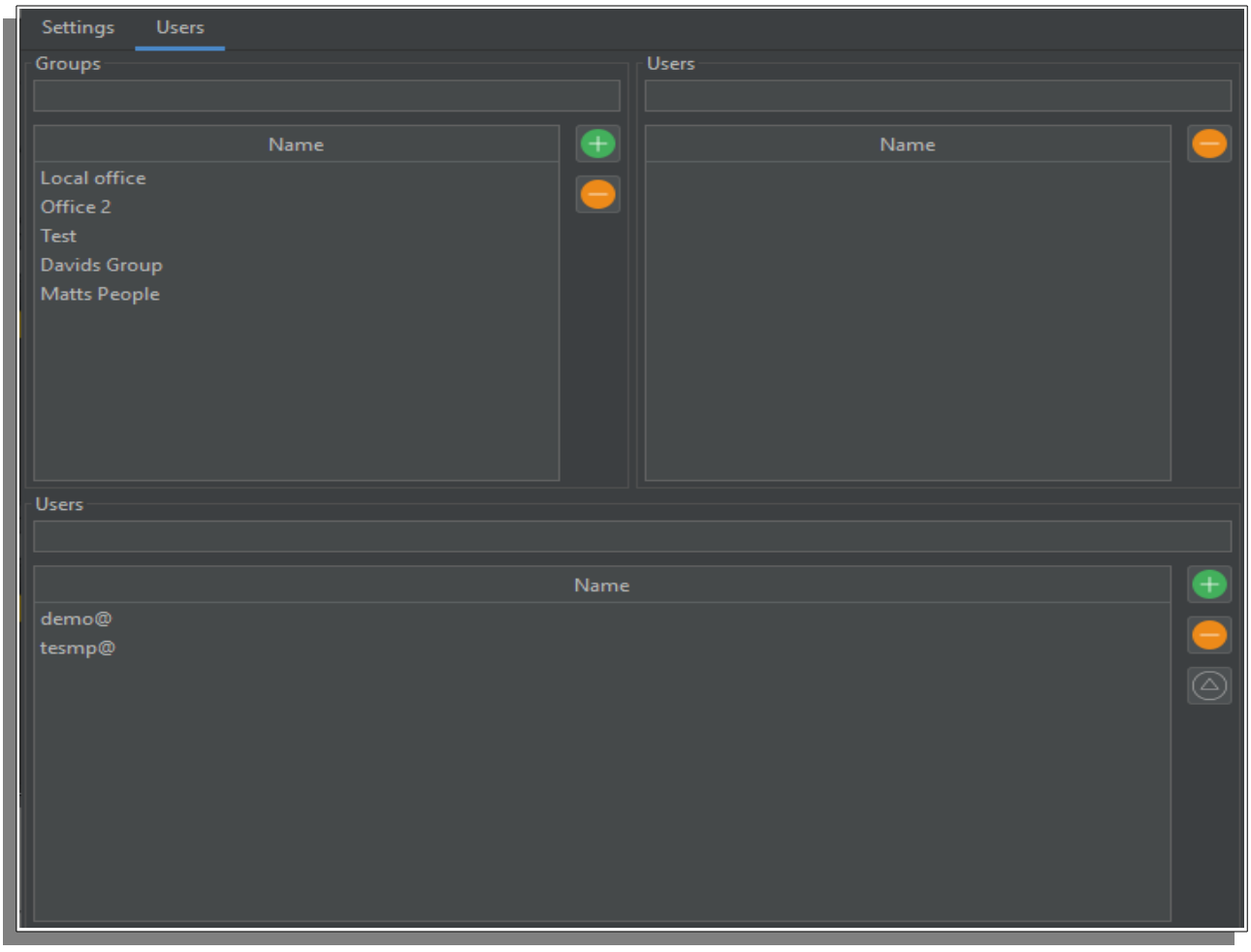
2.4.2 Users

The users tab is used when no Active Directory is installed to create groups and user permissions.

Note: *search groups or users by typing names in the grey fields provided.*

2.4.2.1 Groups

Click  to add a new group and type the name followed by “OK”.



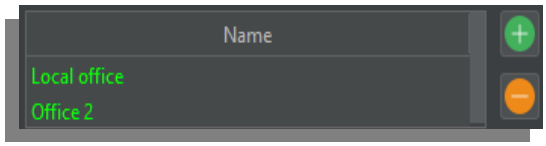
2.4.2.2 Users

Click  to add a new user and type the name followed by “OK”. ***Note:*** *the user name must be the operating systems user name from the machine you are trying to add.*

2.4.2.3 Adding Users to Groups

Click  to add selected user(s) to a selected group(s). First select the group(s) required so they appear highlighted as shown (use the shift key to select more then one), then select the user(s) in the same manor.

2.4.3 Projects & Point Clouds



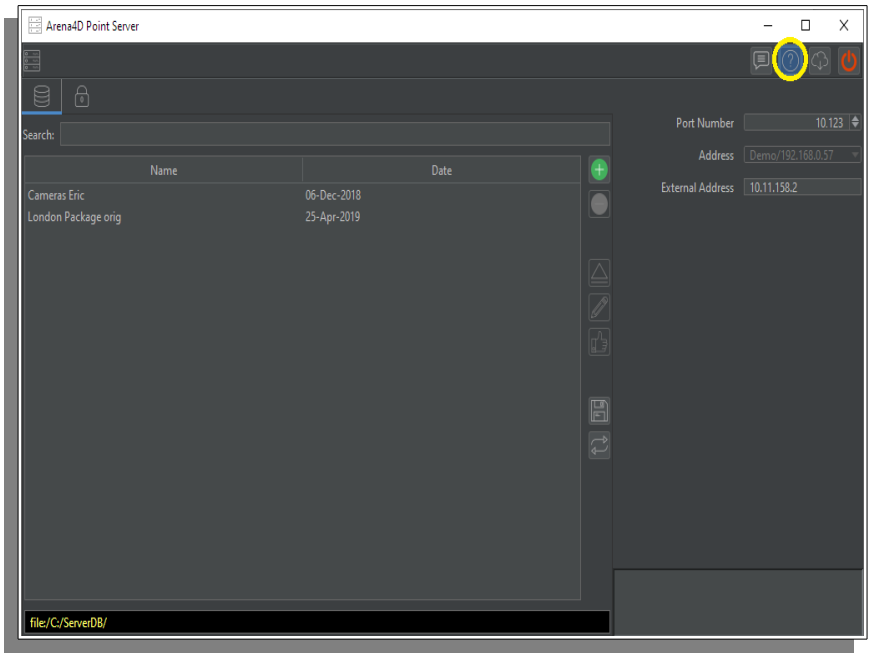
The projects and point clouds tab is used to assign one or more groups to them.

First select a project or point cloud to have group(s) or user(s) added and click to add. Use the shift key to select more then one.

Note: *users and groups displayed in green are non-domain.*

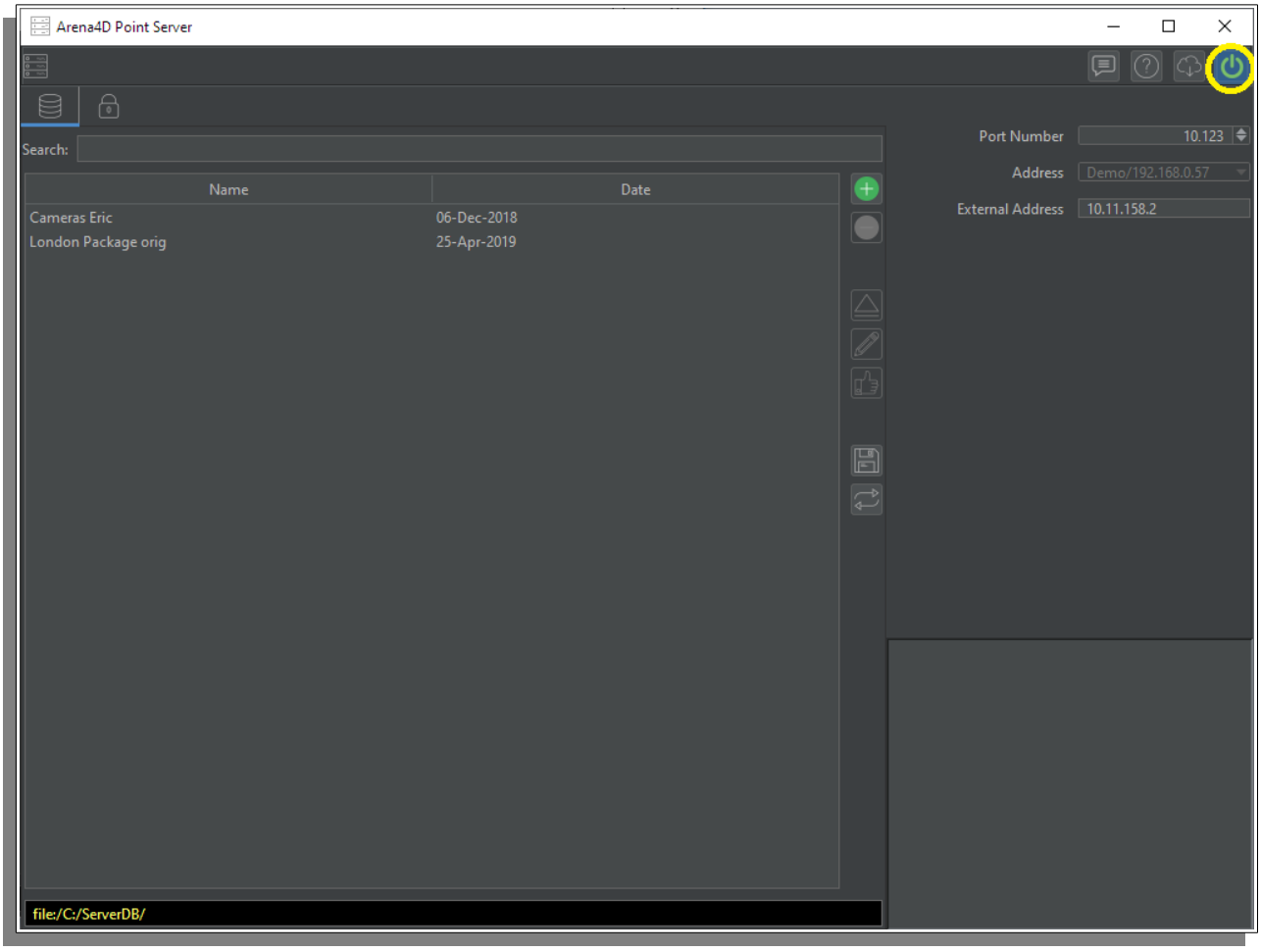
2.5 About 

The about tab shows current version and license information for this edition of Arena Point Server.



3 Activating Server

Once the server is configured it can be activated by pressing the large “power” icon in the top right hand of the window. This icon button will turn **green** when the server is active and serving data, pressing the button a second time will turn it **red** and deactivate the server.



4 PoTree

PoTree is a WebGL point cloud browser that runs on all modern devices from PC's to mobile phones. Version 1.21.0 (or above) of Data Studio introduced a more efficient point cloud format which is ideal for web streaming.

Combining PoTree and Arena4D Point Server allows you to stream your point cloud data to any mobile device around the world from a single central location.

The same data which you use in Data Studio or Rhino can now be exploited remotely without needing to install any additional software on the client.

If the client is not Data Studio or Rhino and on a local network you can just enter the URL shown in section 4.3 URL format to view point clouds in a web browser.

PoTree is a free piece of software available now from **www.potree.org**

Once downloaded please use the following instructions to configure a PoTree Server for accessing an Arena4D Point Server.

4.1 Web Page with URL field

arena4d.html provides a text field for a URL to a **VPC** file served from your Point Server.

The page contains a loadCloud() function which loads the point cloud at the specified url.

The key part of the html is:

```
Potree.PointCloudArena4DGeometry.load(url, function(geometry){
        pointcloud = new Potree.PointCloudArena4D(geometry);
        scene.add(pointcloud);
});
```

Everything else that happens in *loadCloud()* is used to transform the point cloud to the origin, change some material properties and the navigation and to update the user interface, including the progress bar.

4.2 Web Page with hardcoded link

viewer.html displays a point cloud with a hard coded path. You can change the *sceneProperties.path* value to your point cloud URL.

4.3 URL format

A typical Point Server URL would like:

http://<www.myserver.com>:<10123>/web

5 Cesium

Cesium is a cross-platform virtual globe for dynamic-data visualization which can be served VPC (Veesus Point Clouds) from the Arena4D Point Server.

5.1 Web Page with URL field

Request point cloud and style

Set Server, Port and VPC

```
var tileset = viewer.scene.primitives.add(new Cesium.Cesium3DTileset({
        url : 'http://<www.myserver.com>:<port>/<pointcloud.vpc>/tileset.json'
    }));
```

Set 3D Cesium Tile and Size

```
    tileset.style = new Cesium.Cesium3DTileStyle({
        pointSize: 3
});
```

Set Display Properties

```
    tileset.readyPromise.then(function() {
     var boundingSphere = tileset.boundingSphere;
            viewer.camera.viewBoundingSphere(boundingSphere, new
            Cesium.HeadingPitchRange(0.0, -0.5, boundingSphere.radius*2.0));
            viewer.camera.lookAtTransform(Cesium.Matrix4.IDENTITY);
}).otherwise(function(error) {
        throw(error);
    });
```