

# **User Guide**





Software Version 4.0.7.2 September 2021

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# 1 Introduction

#### 1.1 About

Welcome to the user guide for the Veesus Point Cloud Plugin for Rhino.

At the core of the plug-in is our unique point rendering engine that enables the rapid loading and visualisation of unlimited point cloud data sets – the XStreamEngine. The XStreamEngine powers all Veesus products, including our fully-featured standalone point cloud editing tool, Arena4D.

This user guide will help you understand how to use the features of this plug-in, which can only be used in McNeels' Rhinoceros tool. If you find you have any issues or questions which this guide doesn't answer, you can contact us at support@veesus.com.

#### 1.2 Installation

Point Clouds for Rhino is an add-in for Rhino, and therefore will not run outside of Rhino. To install the software, first run the setup wizard and follow all the steps and on-screen prompts during the installation process

😻 Setup - Veesus Point Clouds For Rhino 6.0 version 4.0.7839.18 🦳 🗌	×
License Agreement Please read the following important information before continuing.	
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.	
SOFTWARE LICENCE AGREEMENT	^
Please read this end user software license agreement ("Licence") carefully before downloading or using the Arena4D software ("Application") accompanying this license. By downloading or using the application, you are entering into and agreeing to be bound by the terms of this license.	
If you do not agree to the terms of this license, do not download or	~
[accept the agreement]     [I do not accept the agreement	
Next >	Cancel



Select the directory to install the software: Shown is the default for Rhino 6.



۷	Setup - Veesus Point Clouds For Rhino 6.0 version 4.0.7839.18	_		×
2	Select Components Which components should be installed?		(	
	Select the components you want to install; clear the components you install. Click Next when you are ready to continue.	ı do not	want to	_
	Custom installation		~	
	🔽 Rhino Plugin		70.1 MB	
	.NET Runtime		1.1 MB	
	VC Do diotributables		14.3 MB	
	Reset License			
	Current selection requires at least 72.7 MB of disk space.			_
	< <u>B</u> ack <u>N</u> ext	:>	Can	cel

If you've previously installed a demo licence on your machine and you are now upgrading to a full licence you will still need to run the installation. When the option appears in the wizard, select "Reset Licence". **Under no other circumstances select this option.** If in doubt, continue the installation without the option selected and contact Veesus support.

. Once finished:

- Load Rhino
- From the "Tools" menu select "Options..."
- Select "Plug-ins" from options menu
- Select "Install..." button from plug-in list

Locate the Veesus.rhp file (default location is shown below):

Click "**Open**" once file is highlighted as above.

🚭 Load Plug-in						×
$\leftrightarrow$ $\rightarrow$ $\checkmark$ $\uparrow$ $\square$ $\Rightarrow$ This PC	→ Local Disk (C:) → Program Fi	les → Veesus Point Clouds For Rhino 6	5 v	Search Veesus	Arena4D For Rh	. ρ
Organise 👻 New folder						?
Oracle ^ PDFCreator Pointfuse Limited	Name	Date modified 20/08/2020 12:02 20/08/2020 12:02	Type Siz File folder File folder	:e		
Realtek rempl Rhino 6 Rhinoceros 5 (64- Samsung SOLIDWORKS Co	Veesus.rhp	20/08/2020 11:52 20/08/2020 11:52	Rhino Plug-in Rhino Plug-in	178 KB 15 KB		
Uninstall Informa UNP Veesus Arena4D Veesus Arena4D F Veesus Arena4D F						
File <u>n</u> ame:	Veesus.rhp			Rhino Plug-in	n Files (*.rhp) Cancel	~

Document User Text	^	All Plua-ins			v	Search
Grid						
Hatch		Name	Loaded	Enabled		2
Linetypes		E Sketch Up Export		$\checkmark$	^	
Location		🗁 Sketch Up Import		$\checkmark$		Veesus Point Clouds for Rhino
Mesh		SLC Export		$\checkmark$		Veesus Ltd
Pondor		E SLC Import		$\checkmark$		Version: 3.0.7537.19768
Nerider N Units		Snapshots	Yes	~		Description:
Web Browser		SolidToole		<b>.</b>		Tool for rendering Massive Point Clouds within Rhino
Rhino Options		Coliduades lasest				
3Dconnexion SpaceMouse™				v		
Advanced		🔁 Squish		~		
Alerter		STEP Export		$\checkmark$		{} Commands
Aliases		STEP Import		$\checkmark$		VeesusPointClouds
> Appearance		层 STL Export		$\checkmark$		
> Context Menu		🗁 STL Import		$\checkmark$		
Cycles		🔊 Toolbars	Yes	$\checkmark$		
General		Tutorials		~		
Idle Processor				~		
Keyboard						
Libraries				×.		
Licenses		Veesus Point ( ) and the date	Yee	~		
> Modeling Aids	$\leq$	Veesus Point Clouds for Rhinc	Yes	$\checkmark$	2	
Mouse		VRML Import		$\checkmark$		
Plug-ins		VRML/X3D Export		$\checkmark$		
RhinoScript		Walkabout		$\checkmark$		details
Selection Menu					*	
> IOODAIS Undates and Statistics		Install				
View		Ask to load disabled plug-ins				

Once loaded ensure the plugin is Enable. If it is not loaded, right click on it and select "Load Plugin":

Select "OK" to close the "Rhino Options" menu.

#### Note: the above may differ slightly for Rhino 5.0 and Rhino 7.0





#### 1.3 Rhino Settings

Arena4D makes extensive use of advanced OpenGL functions. Therefore it is important to ensure that "**Use accelerated Hardware mode**" is active under the main View options of Rhino 5, or Rhino 6 "**GPU Tessellation**":

🖑 Rhino Options	×	
Hatch         Linetypes         Location         Mesh         Notes         Render         > Units         Web Browser         Rhino Options         3Dconnexion SpaceMouse™         Advanced         Alerter         Aliases         > Appearance         > Context Menu         Cycles         > Files         General         Idle Processor         Keyboard         Libraries         Licenses         > Modeling Aids         Mouse         Plug-ins         RhinoScript         Selection Menu         > Toolbars         Updater and Statistics         View         > Display Modes         OpenGL	Appearance Settings Antialiasing: 4x COPU Tessellation Video Hardware & Driver Information MVIDIA Corporation GeForce GTX 960/PCIe/SSE2 OpenGL version: 4.60 NVIDIA 388.13 Reafer version: 4.6 Shading Language: 4.60 NVIDIA Driver Date: 10-27-2017 Driver Version: 23.21.13.8813 Maximum Texture size: 16384 x 16384 Z-Buffer depth: 24bits Stencil depth: 8bits Maximum Viewport size: 16384 x 16384 Total Video Memory: 2 GB	
	OK Cancel Help	

#### 1.4 Data Formats

Arena4D for Rhino requires point clouds data to be in the Veesus VPC format. To generate a VPC file you need to use the standalone **VPC Creator** which can be download for free from the Veesus website.

#### 1.5 Loading & Saving

All Arena4D options are saved into the Rhino document. However the point cloud is saved as a reference, therefore if you move or delete the VPC file after saving the document it will not be loaded the next time you open it with an on screen notification.

#### Professional Version only in blue:

#### 1.6 Installing Veesus Point Cloud Render Plugin

#### Note: the following sections only applies to the Professional version of the plugin

Veesus Point Cloud Render for Rhino installs as a plugin through the Rhino plugin architecture. To do this first perform steps: 1.2 Installation.

- Load Rhino
- From the "Tools" menu select "Options..."
- Select "Plug-ins" from options menu
- Select "Install..." button from plug-in list

Locate the **VeesusRender.rhp** file (default location is shown below):





🐼 Rhino Options Х Document User Text ٨ All Plug-ins Y Search Grid Name Loaded Enabled Hatch  $\bigcirc$ Linetypes Solidworks Import  $\checkmark$ Location Veesus Point Cloud Renderer for Rhino 🔊 Sauish ✓ Mesh STEP Export  $\checkmark$ Veesus Ltd Notes Version: 3.0.7537.19768 E STEP Import ✓ Render Description ✓ > Units 📕 STL Export Tool for rendering Massive Point Clouds within Rhino Web Browser ✓ C STL Import Rhino Options Toolbars  $\checkmark$ Yes 3Dconnexion SpaceMouse™ 🄊 Tutorials  $\checkmark$ Advanced VDA Export ✓ Alerter {} Commands DA Import ✓ Aliases PointCloudRenderer O Veen esus Point Cloud Re > Appearance  $\checkmark$ Ye > Context Menu Veesus Point Clouds for Rhind Yes -Cycles  $\checkmark$ C VRMI Import > Files VRML/X3D Export  $\checkmark$ General Idle Processor 🄊 Walkabout  $\checkmark$ Keyboard  $\checkmark$ WAMIT Export 🗁 File Types Libraries ✓ WAMIT import Licenses NebBrowser ✓ Yes > Modeling Aids Mouse H Windows Metafile Export ✓ Plug-ins ✓ X Export RhinoScript C X Import ✓ <u>details</u> Selection Menu > Toolbars Install... Updates and Statistics Ask to load disabled plug-ins > View OK Help Cancel

Once loaded ensure the plugin is Enable and Loaded. If it is not loaded, right click on it and select "Load Plugin":

From the "**Render**" menu select "**Current Renderer**" option followed by "**Veesus Point Cloud Render**":



## 2 General Work Flow

Once point cloud(s) are loaded into the Arena4D plug-in the following steps might form part of a general workflow:

- Orientate the point cloud. Section: 3.3.2 Align
- Set the point cloud Origin. Section: 3.3.1 Origin
- Professional version only: Clean the point cloud (delete)
- Perform a Shader for quick inspection of elevation changes. Section: 3.7 Shader
- Perform Slices and Clipping. Section: 3.5 Slices and 3.6 Clipping



#### 3.1 General

The Arena4D user interface is very simple and consists of a number of control tabs which separate the key functional parts of Arena4D into separate sections.

In each section there will be three common buttons.

The "+" button adds an item to the current list, "-" button removes.



#### 3.2 Point Clouds

Vee       Image: Angle of the second	When a point cloud is added and selected in the displayed list, a number of options become available which control the appearance of that point cloud in the Rhino view windows.
Enabled Name Point Count     fusiNEW2 300,193,979	<b>Quality –</b> determines the density of the rendered point cloud. The higher the quality the better the appearance, but the slower the performance.
	Point Size – The size of points.
	<b>Render –</b> Draw using Intensity, Colour or Ramp values.
	<b>Filing –</b> Fills gaps in the point cloud data by intelligently sampling the point data.
	<b>Ratio –</b> Controls the power of the filling setting for distance.
	<b>Opacity –</b> The transparency of the selected point cloud(s).
Quality	<b>Brightness –</b> The brightness of the selected point cloud(s).
Render Colour	<b>Contrast –</b> The contrast of the selected point cloud(s).
Filling 🗹 Enabled	<b>Zoom</b> button centres the Rhino views on the currently selected point cloud(s).
Opacity	Restore button restores point cloud deletions.
Brightness Contrast	Clash Detection detect clash between point clouds and meshed surfaces see: 3.8 Clash Detection
X 0.75239999999998	Server button see section: 5 Arena4D Point Server
Y -8.43265	<b>X</b> – Position of this axis
Scale 1	<b>Y</b> – Position of this axis
Align 🛠 😂 🖕 X 🔹 🐴 🐴	<b>Z</b> – Position of this axis
cloud(s). Can be scaled up or d	<b>Scale –</b> Adjust the displayed size of the selected point own.

Align – Tools used to manipulate the point cloud(s) position and rotation see: 3.3 Align

#### 3.3 Align



Tools used to position and rotate selected point cloud(s) within Rhinoceros own local coordinate system.



## 3.3.1 Origin

Position a Rhinoceros "**Single Point**" on the selected point cloud. Select the created point highlighting it **yellow** and select the **Origin** icon. The point cloud will be moved to X,Y,Z 0,0,0 centred on the selected point.





## 3.3.2 Align

Create two Polylines horizontal and vertical (**horizontal MUST be created first**) each representing a new axis for the selected point cloud. Select both polylines highlighting them yellow and select the **Align** icon. The point cloud will transition relative to the new axis.

*Note: use Axis, Flip and Rotate to correct the orientation.* 



## 3.3.3 Reset Position

Resets any of the align or origin operations back to the point cloud(s) original loaded location/rotation.



## 3.3.4 Axis

Select which axis **Flip** and **Rotate** are applied to **X**, **Y** or **Z**.



# 3.3.5 Flip

180° flip selected point cloud(s) around selected **axis**.



## 3.3.6 Rotate

90° flip selected point cloud(s) around selected **axis**.





#### 3.4 Options



The options panel features settings that affect all point clouds.

**Lighting** – Adds dynamic lighting to the scene with the light source behind the current eye position.

**Rendering** – Removes VPC point cloud(s) from the view displays.

**Snap** – If "**Point**" is enabled under the "**Osnap**" settings of Rhino then Arena4D will allow Rhino to snap to the closest point nearest the cursor in the point cloud.

#### 3.5 Slices

Slices are a way to quickly visualise a section through the point cloud. Slices can only be created on orthogonal views and not on the main perspective view unless using the Two Point Slice: %

The slice is visualised in the viewing windows by a solid line passing through the data.



Above and below the line are dotted lines representing the width of the slice.

The slice can be manually moved by clicking and dragging the solid slice line or section: 3.5.10 Step Slice.

A slice is applied to the currently active view when added.

It is possible to have multiple slices active at any one time, so long as they are not in the same view.

Point Clouds Options Shader Slices Clipping Viewpoints About	Each slice has the following properties:
Enabled Lock Colour Name View Width Step Perspective Attach Clipping Highlight Native	Lock - prevent slice from being moved.
Image: Constraint of the state of	Colour - select individual colour.
	<b>Name</b> - meaningful names can be applied.
	Width - in units of current document.
	<b>Perspective</b> - enable whether you want the slice effect to be visible in the main perspective view.
	<b>Attach</b> - attached construction at the <i>Slice</i> when turned on. Turn off, move slice and construction will stay at previous <i>Slice</i> position.
	<b>Clipping</b> - effect the selected points within clipping.
	<b>Highlight</b> - whether the slice is highlighted at all times.
■Z=⊕↑%û <\\ \> \\	<b>Native</b> - allow the slice to also effect native Rhino objects.

At the top of the slice window are two buttons:



# 3.5.1 Two Point Slice

Creates a slice between two user points and is useful for slicing the data if not aligned to the construction plane. Click two points inline where the slice is required.



## 3.5.2 Slice From Plane

Adds the selected slice from the "**Named CPlanes**" tab to the Slice tab within the Arena4D plugin. First a slice must have been added to the named cplanes tab, see section: 3.5.7 Plane From Slice. Make sure Named Cplanes is turned on by right clicking on "**Arena4D**" tab and selecting "**Named Cplanes**".

Select the "**Named Cplane**" tab followed by the Cplane slice to be added and it will be shown in the Rhino views as three axis. Now click the slice from plane icon









#### 3.5.3 CSV (Plane Analysis)

Creates a text based CSV (Comma Separated Values) file containing X,Y,Z -R,G,B – Intensity - Classifications – Distance (from centre of slice outwards in both directions).



## 3.5.4 Vector

With a slice positioned as required, make the viewport full and select Vector. The resulting Rhino drawings will be centred around the middle of the sliced data. These drawing can then be exported from Rhino into any format you require.



#### 3.5.5 Outline

With a slice positioned as required, make the viewport full and select Outline. The resulting Rhino drawings will be outlined around the middle of the sliced data. These drawing can then be exported from Rhino into any format you require.



## 3.5.6 Position Slice

Click directly where to position the slice within the active slice.



## 3.5.7 Plane From Slice

Adds the currently active slice to the "**Named Cplanes**" Newly created Cplane(s) can be seen under the Named Cplanes tab.





## 3.5.8 **Position Slice Between Two Points**

Select the two outer limits of a slice to position it in the middle of those limits.



## 3.5.9 Align To Curve

The polyline icon allows you to convert a Slice from a traditional orthogonal slice to one that aligns with a curve. To use this feature you must have first added a curve or line to the data. Select the slice to Align then by clicking the "Align To Curve" button and clicking anywhere along the curve or line will align the view and slice (and optionally the construction plane) to that point on the curve. *Note: the curve or line (any Rhino object) must NOT be selected before clicking the "Align To Curve" button.* 

# 3.5.10 Step Slice

The left and right buttons step the currently selected slice by it's current step setting.



# 3.5.11 Attach to Plane

Aligns the view construction plane with the slice position.

"Attach To Plane" means that the construction plane in the slice view will follow the movement of the slice if enabled.



#### 3.6 Clipping



At the bottom left of the clipping panel are 7 buttons.



**Select All** selects all the points in the currently enabled point cloud(s).

Clear unselects all the points in the currently enabled point cloud(s).

Invert inverts the current selection.

Hide will make selected points become invisible/visible.

The clipping tab is used to select areas of point data that you wish to hide or unhide.

The four main controls of the Clipping tools are *Select*, *Unselect*, *Invert* and *Remove* as represented by these icons:

**Select** activates the clip tool in the current active window. Use the left mouse button to add points to the clip polyline and the right mouse button to end the selection.

All data within the polyline will be selected.

**Unselect** works in the same way but unselects everything within the polyline.

**Invert** toggles the effect of the select and unselect tool. Instead of selecting everything within the polyline they will select everything outside the polyline.

Once data is selected it will turn green in the main viewing window.

Remove selected clip(s).



#### Professional Version only in blue:

**Delete** selected points from the point cloud (use clips to select the area).

*Note: to restore the point cloud back to how it was original created with the VPC Creator see section 3.2* Point Clouds "*Restore*".

**Copy** selected points (use clips to select the area) to a new Veesus Point Cloud (VPC). File name will be request.

**Plane Through Points** adds the currently active clip to the "**Named Cplanes**" Newly created Cplane(s) can be seen under the Named Cplanes tab.



As well as creating individual clips you can group a series of clips into a clip group. For example you may have taken a number of selections to isolate a chair in a room. You can select all these clips and create one single clip group by

pressing the create clip group button.

Individual clips or clip groups can be applied at any time by either double clicking them in the list, or clicking the process button opposite the table.





**Delete Selected** deletes all individually selected clip(s) and in the group section deletes all individually clip group(s). **Note: Does NOT unselect all the points in the currently enabled point clouds.** For this to happen select the Clear



#### 3.6.1 Point Clouds

Arena4D provides the ability to convert areas of point cloud(s) from the Arena4D plugin into a native Rhino point cloud object or save as a Arena4D VPC file.

Using the clipping tool to highlight an area of interest, select either **Rhino** or **File** from the option at the bottom right of the screen and press the cloud icon.



#### 3.6.2 Clipping In Slices

If an active slice and its "*Clipping*" tick box is turned on whilst performing a clip operation, only data within that slice will be effected.

For example a slice could be cutting through the floor of a room, meaning only the floor is visible. Creating a new clip whilst this slice is active will ensure only data from the floor is selected.



#### 3.7 Shader

Slices	Clipping	Viewpoints	About	The shader panel provides control
Point C	louds	Options	Shader	over the planar shader. This is a
Enabled			capability which colours data along a plane normal <b>vector</b> from the <b>construction plane</b> out.	
XYZ	0 0	1	Ó	The shading is enabled per view. Once enabled/disabled in one view you can
Range	10			apply this to all others by clicking the
Offset	0			corner.
Repeat	Clamp		~	Once enabled you can change the shaders direction by changing the XYZ
Colours	Custom		~	values of the normal vector. XYZ should add up to ' <b>1</b> ' so if your point
Blend			1 1 1	cloud was aligned true to the construction plane, the value 0,0,1 would shade on the Z axis (up). If your point cloud is not true to the construction plane then values of 0.054,-0.041,0.998 for example may provide a the alignment (yours will be different).

A simpler option is to align the shader to the view direction. Pressing the eye icon will set the XYZ values for you and set the shader "**zero**" point to be your construction plane position in that view.

Range – The distance over which the shader will calculate values.

**Offset** – The distance from the shader zero point to start calculating from. Useful for moving the shader along the axis without changing the construction plane.

**Repeat –** How the shader should act once it has gone beyond either the start or end location as calculated by Range + Offset:

- Clamp, continue with first/last colour.
- Stop, don't apply colours beyond range.
- Repeat, loop through colours again.

**Colours** – You can chose between your own custom colour palette in the shader, or to use the entire RGB hue values.

Blend – Effect of shader on point colours.



## 3.8 Clash Detection

When Point Clouds and Meshed Surfaces come into contact, the clashed areas will be highlighted with a red cross.

Turning the Clash icon on/off will display or remove clashed arears. *Note: visual performance will be reduced with clash enabled.* 



#### 3.9 Viewpoints

Point Clo	ouds	Options	Shader	Viewpoints are a fast way of
Slices	Clipping	Viewpoints	About	repositioning your view position in
Name				If you have a view positioned in a way you would want to recall later, click the
Door				Add button to esave it.
Floor One				To remove viewpoint(s) highlight and
Floor Two				click the remove ebutton.
Viewpoint				
				Double clicking a saved viewpoint, or selecting it and pressing the tick button will put all the views back to their saved positions.

#### 3.10 Rendering VPC Files

Veesus Point Clouds can be rendered within Rhino using the Arena4D Render plugin. First select the **Render Properties** from the **Render** pull down menu, specify both the resolution and backgroud colour. *Note: resolution is limited unless a licensed plugin is used.* 

Document Properties		×
Document Properties     Annotation     Grid     Mesh     Notes     Render     Rendering     Units     Web Browser     Neb Browser     Neter     Alases     Appearance     Context Menu     Files     General     Idle Processor     Keyboard     Libraries     Licenses     Modeling Aids     Mouse     Plug-ins     Rendering     Rhino Script     Selection Menu     Toolbars     Updates and Statistics     View	Resolution <ul> <li>Mewport resolution</li> <li>Tustom</li> <li>Midth:</li> <li>1920</li> <li>Height:</li> <li>1080</li> </ul> Antialiasing <ul> <li>Nong</li> <li>Nomal and Slower</li> <li>Best and Slowest</li> </ul> Momel and Slower   Best and Slowest   Render colors Miscellaneous <ul> <li>Shadows</li> <li>Use lights on layers that are off</li> <li>Render gurves and isocurves</li> <li>Render gimensions and text</li> </ul> OK Cancel Help	

Selecting Render Preview will produce a quicker render of the point cloud(s) and Render will produced the most detailed render. *Note: higher the resolution and more point cloud points the more time it will take for the rendered image to appear.* 

Render	Panels Help		
Shade			
Render Preview			
Render			

Functions within the Render window such as Exposure and Post Effects operate in the same manor as the standard Rhino Renderer.

#### 3.11 Point Cloud not displayed correctly

There are conditions that may stop a point cloud being displayed:

- If the point cloud is not displayed correctly in the shaded view, try turning off *"ground plane*" within Rhino.
- Arena4D Data Studio is capable of generating "protected" VPC files. These disable export functions and optionally add an expiry date to the data. Once the expiry date has passed you will no longer be able to view the data.

If your point cloud data is not visible, check with the VPC provider whether they protected and enforced an expiry data on the files you were provided.



Users with access to Zappcha can stream point cloud data stored in The Zappcha Cloud to Point Clouds for Rhino. This means you can work on point clouds without having the point cloud data on your computer.

NOTE: you need an active Zappcha account to use this feature. To create your Zappcha account for free, please visit Zappcha.com.

Veesu Sli Poi	is ces nt Cloud	Named C Clippi s	Dayers ng Zappcha	<ul> <li>Properties</li> <li>Viewpoints</li> <li>Options</li> </ul>	Notificati () About Shader	To access Zappcha, first select the Zappcha tab.
Usern. Passv Sto	ame: vord: rage: 0	Bytes / 0 Byte	S POINT CLOUD w.zappcha.co	CHA		Enter your <b>username</b> and <b>password</b> . Click the <b>cloud</b> button to log in to the Zappcha Cloud.

Veesus	🔲 Name	ed C 阿 Lay	ers	O Properties	🔔 Notificati 🍈	
Slices		Clipping		Viewpoints	About	
Point Clouds		Zappcha		Options	Shader	
•					26 CD	
🖌 Ena	oled Name	Point Count				
✓	London	515,778,766				
✓	pipe	25,013				

Moving back to the Point Clouds tab, clicking the cloud icon 🛆 will launch the **Point Streams** window.

2 Point Streams	-		×
Zappcha Point Server			
Name			
911 Vis.vpc			~
Alfa4C.vpc			_
Cars Overlaved.vpc			- 11
Faro Garage.vpc			- 11
Fire.vpc			-
Fire_Escape_iPhone.vpc			_
Firearm.vpc			_
Fusi.vpc			_
GR Supra vis.vpc			_
House Front Vis.vpc			
House Rear Vis.vpc			_
House VIS filter.vpc			_
Leica.vpc			
M House.vpc			
MGTF.vpc			_
Milau.vpc			_
OfficeFloors.vpc			
DedisCACAuse			~
		~	×

In the Point Streams window, select the **Zappcha** tab. You will see all the point clouds you have saved to your Zappcha Cloud.

Click on a point cloud in the list to select

it, and simply click **Open** to start streaming that point cloud to your viewer. Once it has loaded, the point cloud can be worked on in exactly the same way as any other point cloud. The red cross button next to it closes the window.

# 5 Arena4D Point Server

For owners of or permitted access Arena4D Point Server(s) you can stream data to Arena4D for Rhino.

To access to Arena4D Servers first select the Point Cloud tab.

🔍 Are 🜔 Pr	o 📎 Lay 🧕	Ren 🔗 Ma 🗁 Lil	br 🔯 Help 🔅	Click	ing the <b>Open Point Stream</b>
Slices	Clipping	Viewpoints	About	butto	on will launch the <b>Point Server</b>
Point Cl	ouds	Options	Shader	Man	ager
Enabled	Name Point Co Pump 1,213,990	ount			
Point Streams http:// 127.0.0.1:101 Point Server 127.0.0.1:10123	123	Point Cloud		×	To add a new server enter the URL of the server including the port number, then click the Add + button.
					For example <i>127.0.0.1:10123</i>
					Once the server is added it will appear in the list of available servers.
	•				Selecting a server will produce a list of point clouds on that server in the right hand side. Once a point cloud is selected from the
	•				hand side. Once a point cloud is selected from the server simply click <b>Open</b>

to start streaming that data to your viewer.

Streamed point clouds can be manipulated in anyway a normal point cloud file can be.



# 6 Scripting

It is possible to control a number of Arena4D functions via RhinoScript.

Note: Slices can be added by point or by width, to understand the difference please refer to the slicing section for more details.

```
public void SetPointCloudsVisible( bool visible)
public void AddSlice( int red, int green, int blue, double step, double
width, bool colourPoints, bool clipping, bool locked)
public void PositionSlice( bool width)
public void PositionSlicePoint( object position)
public void PositionSliceWidth( object positionList)
public void EnableSelectedSlice( bool enable)
public void MoveSlice( bool positive)
public void SetActiveSliceByView()
public void AddClip()
public void AddViewpoint()
public void SetPointSnap( bool on)
public void OpenPointCloud( string path, int pointSize, float quality, int
colourMode)
public object ListPointClouds()
public void RemovePointCloud( int index)
public object GetSelectedPoints()
public void SelectAllPoints()
public void ClearSelectedPoints()
```

<u>Example</u>

Option Explicit

Dim customobj

On Error Resume Next

 $Set\ customobj = Rhino.GetPlugInObject("\{904b9f2e-f13f-4021-be5f-0318da03cc70\}")$ 

If Err Then

MsgBox Err.Description

Else

customobj.AddSlice

End If

#### 

 $Tools \rightarrow Options \rightarrow Plug-ins \rightarrow Veesus Point Clouds for Rhino \rightarrow Details:$ 

	Veesus Point Cloud Render	er Yes	✓			
- U	Veesus Point Clouds for Rhi	ind Yes	$\checkmark$	{} Commands		
- U	C VRML Import		$\checkmark$	VeesusPointClouds		
- U	VRML/X3D Export		$\checkmark$			
- U	🔊 🔊 Walkabout		$\checkmark$			
- U	WAMIT Export		$\checkmark$			
- U	🗁 WAMIT import		✓			
- U	NebBrowser	Yes	$\checkmark$			
- U	Windows Metafile Export		~	🗁 File Types		
- U	层 X Export		~			
- U	X Import		~			
	KGL Export		✓			
	ZCorp Export					
- U	ZCorp Import		✓ .	<u>details</u>		
L	Install					
echnical Inform	nation					
GUID ID:	904b9f2e-f13f-4021-be5f-0318da03cc70					
File Name:	C:\Program Files\Veesus Pointclouds Rhino 6\Veesus					
Registry Path:	\\HKEY_CURRENT_USER\Software\McNeel\Rhinoceros\6.0					

<u>Close</u>