MOZILLA HUBS USER GUIDE v1.1

This short document provides an introduction to Mozilla Hubs and how to explore and collaborate in spaces created with it. It does not cover Spokes – the Hub creation tool.

What Is It?

Mozilla Hubs is an open-source virtual world application developed by the Mozilla Foundation (the people who write the Firefox Browser). They host a free public version, but you can also download and host your own versions if you want complete control, or to run on an Intranet or to customise the code.

How Can I Access It?

A Mozilla Hubs Space runs completely in the browser, there is no need to download and install any software on your computer or VR headset. Hubs is designed to work for users with a VR headset, or with just an ordinary PC, tablet or smartphone. You just follow a link from a web page to a Hubs Space and start exploring it. In a VR headset you use the headsets web browser to navigate to the page as usual, and then click on a button to go into full VR mode. To make Space access easier in VR each Space has a 6 digit Hubcode associated with it, which you can enter using a VR keyboard at https://hubs.mozilla.com/link.

No account is required to access Mozilla Hubs, but you do need one if you want to create Spaces, or to have a persistent name and avatar (otherwise you have to choose each time) or to save favourite Spaces.

Is it Safe?

Mozilla Hubs is a multi-user environment, when you go into a Space there may well be other people in there that you can text chat and audio talk to.

The owner of a Space can restrict access by:

- Not listing the room and only allowing those with the link to join it, or
- Not listing the room and having a revokable link that can shut down room access if it is abused

The owner is also able to control what users can do, for instance limiting their ability to rez objects, pin objects (so they persist after the user has left the room), create drawing and create emoji (all of which are explained below).

The fact that access is anonymous (although by invite) may actually be of benefit it some use cases.
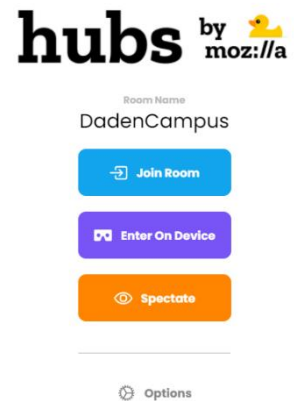
If you are really concerned about safety and security then a private instance of Mozilla Hubs is probably the best answer – ask us for more information.

Note: The terms Space, Room and Scene are used pretty interchangeably in this document. In fact whilst Space and Room and more or less synonymous Scene refers to what you see in a Space/Room, and the owner can change the Scene displayed whilst people are in a Room.

Entering a Space

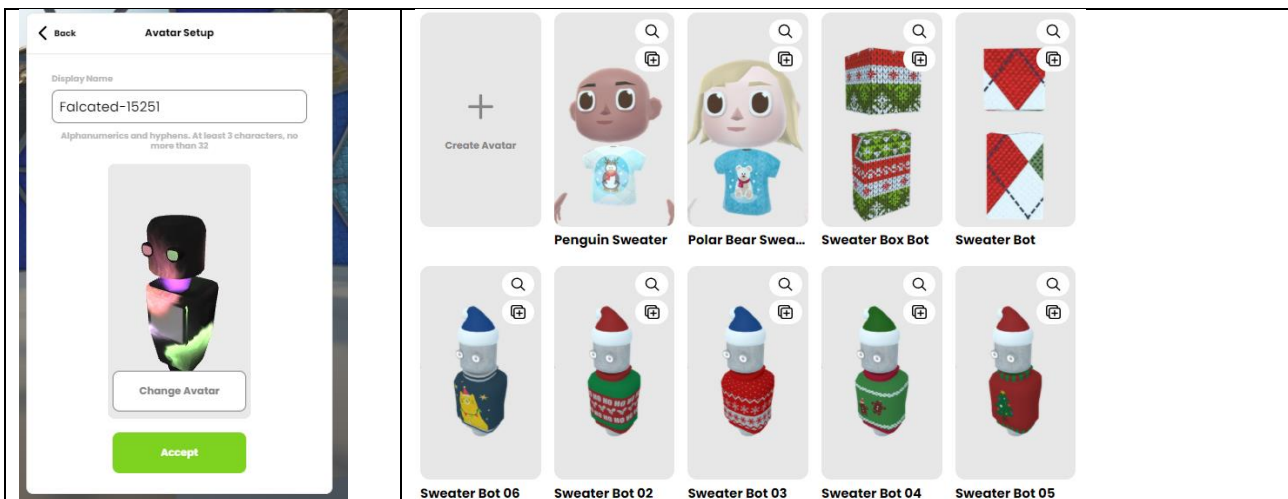When you arrive on the web page for a space this popup (right) appears.

You will usually select Join Room. VR headsets automatically identify themselves so it's Just Join Room on those too. "Enter on Device" give you a 6 digit hubcode that you can enter on another VR device. "Spectate" puts you in the room, but you are invisible and can't communicate and you are fixed in one location – the spawn point. Options is really only applicable to Space owners. So click on "Join Room".

In VR you may initially see the space in the 2D browser, in which case you need to select the Enter VR/Enter VR Mode (or similar) option that displays on the screen (usually centre, bottom, or bottom right).

Choosing a Name and Avatar

If you're not logged in from a permanent account you'll be assigned a random name and avatar, and the ability to change them.
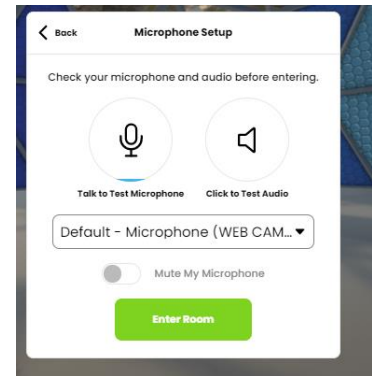
The avatar range is pretty limited/samey and all quite cartoony (just some are shown above). Speak to us if you need some custom avatars done. Or try https://readyplayer.me/avatar.

Once happy with your choice of name and avatar click on Accept.

- Audio Settings

Since Hubs is all about SocialVR and collaboration the next step is to enable access to your microphone and/or choose your microphone and adjust its settings.

And then you'll be placed into the room at a spawn (i.e. start) point chosen by the room creator.

Moving Around – Computer

Movement within a space is the usual WASD for forward (W), Backward (S), Strafe left (A), Strafe Right (D). Q rotates left (in 45° steps), and E rotates right (also in 45° steps). You can "run" by holding SHIFT whilst also using WASD.

Holding the Left Mouse Button (LMB) and moving the mouse lets you look around. Holding the Right Mouse Button (RMB) shows a teleport point, move the mouse to move the point, let go of the RMB and you jump to the teleport point. Note that clicking RMB on an object brings up the Object Inspector which lets you see that object closer up/in more detail (more on that below).

Pressing "G" (go fly!) toggles fly mode. With fly mode enabled use the LMB and mouse to look upwards, then press W to move forwards and you will fly up into the air. To get back to the ground use LMB to look at the ground and again press W to move towards the ground.

For touchscreen controls when using a mobile device see at https://hubs.mozilla.com/docs/hubs-controls.html.

Moving Around – VR HMD

With a VR HMD the main movement controls are (these are for Quest, other HMD are similar):

- Move   - Left controller thumbstick
- Turn   - Right controller thumbstick
- Move faster   - B or Y buttons
- Teleport   - Use either Trigger to point at a location and release

Of course, in VR you can also just move your body around our physical space (assuming you have a 6DOF device like the Oculus Quest).

Room Actions – Computer

The main room actions are controlled by a set of 5 icons on the bottom of the screen:
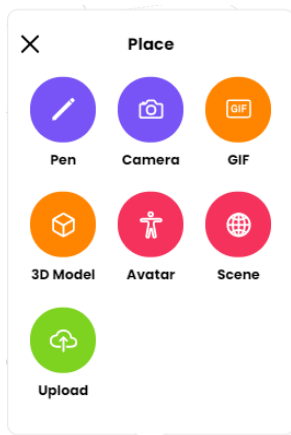

Voice – Toggles your mute setting

Share – allows you to share your screen or camera. Once you've selected what to share it appears on a 2D screen in-world which you can repositioning by holding the LMB and moving your mouse. You can't resize it. The +/- buttons that appear when you hover over it adjust volume, and the "magic wand" takes an in-world photo (see below). You can drag a screen into a media Frame to make it bigger. Note that the screen tends to go black if an app is minimised. To delete the screen right click and selected Delete.

React – displays an in-world 3D emoji – there are several to choose from.

Chat – opens the text chat window

The Place icon give you access to a similar set of functions that you get in the VR menu bar.

Pen – lets you draw (and just about write) in world. SHIFT+E and SHIFT+Q cycle through the available colours and SHIFT+MOUSEWHEEL changes thickness. CTRL-Z deletes the last stroke. Note that the pen "intelligently" draw flat on a horizontal surface and upright on a vertical surface. You can't draw in free space as you can in VR (Tilt-Brush style). Escape quits the pen.

Camera – rezzes a camera and shows you what it is seeing. Click and hold LMB on the camera to drag it into position (you can also move yourself at the same time). Then Click on the top Camera to take a still, or the bottom Video icon to take a video (default 7 seconds, alter duration with the arrow buttons) – both have a 3 second countdown.

In both cases the camera then rezzes the picture in-world. You can drag it around and if a media-frame is available drop it into the frame to be shown at a larger size. There is a "Tweet" button to tweet the picture (needs you to give Hubs your Twitter permissions). If you want to locally save a copy of the photo then right-click and take a screen grab is the best bet!

GIF – lets you choose an animated GIF from their library, or upload one from your PC or point to a URL. The GIF then appears in world and can be moved like any object (see below).

3D Model – lets you choose a 3D model from their library (and Sketchfab) and rez it in world (this can be disabled by the room owner). Lots of fun things to play with!

Avatar – lets you choose and rez and avatar, and then click on Use Avatar to change yourself to that avatar.

Scene – lets you choose from a selection of Scenes/Rooms and rez a portal in-world which you can then click on to go to that scene/room. Note: If the Room Owner does this they get the option to replace the current scene with a new one, instantly replacing the existing environment for everyone – a very useful instructional tool (but note this change is persistent).

Upload – this is a shortcut to the upload options under GIF and 3D Model, letting you upload a 3D model or image from your PC or a URL.

Chat Actions

As well as global text chat you can also issue commands in chat, including:

/leave - Disconnect from the room.
/grow - Increase your avatar's size.
/shrink - Decrease your avatar's size.
/duck - Create a duck object.
/debug - Toggle physics debug rendering.
/vrstats - Toggle stats in VR.
/scene <scene url> - Change the scene (moderators only).
/rename <new name> - Rename the room (moderators only).
/audiomode - Toggle left-right spatialization, but keep distance-based attenuation (experimental).
/audioNormalization <factor> - Equalize audio levels (experimental)
/fly - Toggle fly mode.

Room Actions – VR HMD

An actions menu follows you around – usually at the top of your view. The options are:

- **Show people** in the Room
- **Toggle mic** mute
- **Invite** – doesn't seem to do anything
- **Create** (the big button) – opens up the object (Sketchfab) browser so you can choose to rez something. It's less slick than on the PC as it passes you back out to the browser, you choose an object, and then re-enter the room
- **Pen** – gives you a marker pen, you grad it with right paddle and the controls are then:
    - Trigger – Draw
    - Left/Right joystick – change colour
    - Up/Down joystick – change thickness
    - B or Y – toggle between drawing in 2D and 3D
    - A or X button - undo
- **Camera** – take a still photo or movie. You have to grab the camera (right paddle) to re-orientate it, and the press trigger to take photo/video.

In addition you can:

- Increase/decrease **media volume** - Up/down on right thumbstick While hovering over media
- Show **emoticon menu** – press and hold A or X, then pull trigger against desired emoji

Object Interactions – Computer

Once you have an object in-world that you can interact with (placed there by you, the room owner, or another user, called an interactable) then you can:

- Move the object by left-click and holding and then moving your mouse
- Move the object further-away/closer by left-click and using the scroll wheel
- Make the object bigger/smaller by left-clicking and then holding SHIFT and then scrolling the mouse wheel.

Note that due to the way perspective and object movement works objects sometimes start to disappear into the ground as you move them. In this case just scroll the mouse wheel towards you at the same time.

Note also that some objects are actually "spawners", and rather than move when you drag them they create a copy of themselves and that is what you are then moving. Spawners can create unlimited numbers of copies of themselves.

If you right-click on an object you get the object details screen, giving you a clearer view of the whole object. From this screen you can:

- **Pin** - Pin/unpin the object, so it persists when you leave the room (this can be disabled by the room owner)
- **Link** – Get a downloadable link to the objects 3D mesh file (in glb format)
- **View** – go to/see the object in its in-world context, taking you out of object mode
- **Delete** – delete the object – if you have permissions
- **Lightbulb View** – see the object in its in-world context, but stay in object mode

Object Interactions – VR HMD

You can grab and object with the left or right paddles and then move it around, and even walk with it. Release the paddle to let go. You can also grab it at a distance using the trigger, and then you can do a bit of a shuffle between your left and right hands to gradually swing it close enough to grab – or use joystick as below!

In addition you can:

- **Rotate object** - Rotate controller, after pressing and holding the "rotate" button in the object's menu
- **Scale object** - Move both hands together or apart while holding object
- **Move object closer/away** – use up/down on right thumbstick while holding an object with cursor
- **Inspect object** – Y or B button, just isolates in front of you, can make easier to read signs
- **Object menu** – use A or X button whilst point at an object (not holding it). Can then:
  - **Rotate**
  - **Resize**
  - **Delete**
  - **Goto link**
  - **Clone**

Audio Chat

Audio chat is enabled by default. It is spatial so you will only hear people close to you. There doesn't seem to be a "shout" option yet.
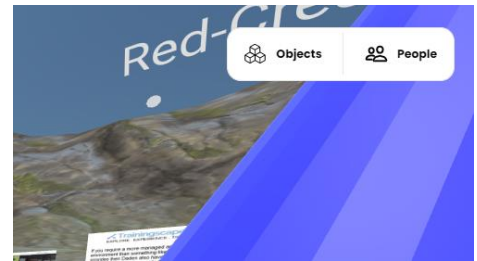
Text Chat

Access text-chat from the Chat menu icon.

Other Actions – Computer

The **back-tick `** (top left key on most keyboards) toggles the UI on and off.

The "**Objects**" option top-right displays a list of all the objects in the room, and you can bring up the object panel for each (and then use the View option to go to it).

The "**People**" option top-right shows who is currently in the room. You can "Hide" them, which will make them (and their objects) disappear form the scene – even though they are still there and others can see them. As a Room Owner you also have options to Mute All and to Kick individuals out.

The "**Invite**" option (bottom left) lets you invite others into the room, copy copy/pasting a link or giving them the 6 digit hub code.

The **"More"** option lets you change your avatar, access your account, access room information and access support. If you have an account you can also "favourite" the current room, and access a list of your favourite rooms.

The "**Leave**" option lets you leave the room, after a confirmatory prompt and return to the Hubs home page. Your favourites are at the bottom of the page, as is a link to the room code keypad.

Other Actions – VR HMD

All covered above we think!

Where can I get more information?

The main Mozilla Hubs information pages are at: https://hubs.mozilla.com/docs/welcome.html

All the movement/action controls/keyboard shortcuts are at https://hubs.mozilla.com/docs/hubs-controls.html

Chat commands and other features at: https://hubs.mozilla.com/docs/hubs-features.html

Want to discuss a Mozilla Hubs project?

If playing around with Mozilla Hubs has given you some ideas of how your organisation could use a 3D immersive environment like this then do drop us a line at info@daden.co.uk for a free, no-obligation chat about what this sort of technology can do, how it can be used, and the pros and cons of the different solutions available.