

BUNDLAR Asset Guidelines

Introduction

This document contains guidelines and best practices to follow when creating assets to put in Bundles.

This guide is current as of 13 Feb 2023.

Quick Reference Table

Object	Requirements	Recommendations
General		
Bundle size		<ul style="list-style-type: none">~50mb total Bundle size on cellular networks~100mb total Bundle size on WiFi networks
Image markers	<ul style="list-style-type: none">Minimum 400x400pxMaximum 800x800pxJPEG formatEach image marker must be unique from other image markers in a given Bundle.	<ul style="list-style-type: none">Use high-quality, visually distinct images, such as photos of people, places, or busy scenesDo not use small text, repetitive patterns, or gradients
Assets		
3D Models	<ul style="list-style-type: none">FBX or GLB formatAny animations must be part of the exported modelAny textures must be embeddedOn-screen limit of 500k trianglesTexture images cannot be greater than 4096X4096 combined on a single model	<ul style="list-style-type: none">Limit file size and triangle counts for optimal performance
Audio	<ul style="list-style-type: none">MP3 format	<ul style="list-style-type: none">Limit audio clips to 30 seconds
Images	<ul style="list-style-type: none">PNG or JPEG format	<ul style="list-style-type: none">Maximum 2048x2048pxAdhere to power-of-two sizes (64px, 128px, 1024px, etc.) for images to allow for faster loading times.
Video	<ul style="list-style-type: none">MP4 formatH.264 codecFullscreen videos must be of 16:9 aspect ratioMaximum total 64MB for all videos in a Bundle	<ul style="list-style-type: none">Limit video clips to 30 secondsMinimize video file size.

Bundles

A **Bundle** or Bundle project is a collection of Augmented Reality Experiences, each of which is itself a collection of assets. For example, a Bundle may be an issue of an enhanced magazine, or it could be an AR Tour of a college campus.


Bundle size affects user experience in two primary ways. Firstly, it determines the initial time a Bundle takes to download to the BUNDLAR app before the user can interact with the Augmented Experiences. Secondly, once this initial download has been completed, it requires storage space on the user's device in order to be accessed in the future.

Assets that go into the Bundle can be of varying size, but the total Bundle size should always be kept in mind when compiling your assets.

Recommendations

With network speed and coverage in mind, we recommend constraining Bundle size to:

- ~50mb if deployment relies on cellular data networks
- ~100mb when reliable WiFi is available to the user

 Avoid spaces in file names for all assets. Instead, use dashes, camel case, or underscores to separate words.

Trigger Type: Image Markers

Image markers are used in recognition-based AR technology. BUNDLAR uses Natural Feature Tracking (NFT) to convert an image into a series of data points. Once the system recognizes these data points through the camera, it tracks them in real-time.

Because image tracking is visually based, the quality of the tracking is reliant on the quality of the image marker. The more distinct features the image marker has, the better it tracks. Additionally, the same image cannot be a marker for two different Experiences in the same Bundle. When you upload an image marker to an Experience, the CMS will automatically evaluate its strength and assign it a rating from one to five stars.

Note that since image markers are converted to grayscale during use, colors of similar value cannot be counted on to differentiate the features.

Requirements

- Minimum 400x400px
- Maximum 800x800px
- JPEG format (Other image assets can be PNG, but image markers must be JPEG.)
- Each image marker must be unique from other image markers in a given Bundle.

Recommendations

- Use a high-quality, visually distinct image marker. Examples of good image markers include: photographs of objects, people, or busy scenes; illustrations; or logos. Small or repetitive images such as small text, patterns like polka dots, and gradients make poor image markers.
- Ensure your image markers are distinct from each other. Image markers that share multiple features may trigger the wrong Augmented Experience.
- Avoid visual interference (for example, lamination) on the surface of your physical image marker, as reflective surfaces and shadows can negatively affect accuracy.
- Be careful with images that are radially or bilaterally symmetrical. The app may struggle to distinguish which side of the marker is the bottom and which is top, resulting in your content triggering upside down or at an angle.
- To improve trigger accuracy, upload image files that square.

i Note that Android requires more features in the image than iOS. For the technically minded, Google offers [this tool](#) for evaluating image markers.

Image Assets

Bundle projects may require a multitude of **image assets**. These image assets could include small logos, medium size thumbnails, or even large backdrops intended to fill the entire screen.

This section deals specifically with the image asset type. Textures on 3D models are discussed in the “3D Model Assets” section. Image markers are discussed in the “Trigger Type: Image Markers” section.

Requirements

- Images with transparency must be in PNG format (.png file extension).
- Images without transparency may be either PNG or JPEG format (.png or .jpg file extension).

Recommendations

- Keep total image size low to improve performance and Bundle size. Typically, a maximum size of 2048x2048px per image is best.
- Consider how large your image will be on-screen. Small logos are better suited to 100x100px, while fullscreen backgrounds that will be seen in more detail are better suited to a size of 1000px or more.
- Adhere to power-of-two sizes (64px, 128px, 1024px, etc.) for images to allow for faster loading times.

Video Assets

Video assets are either displayed on a video player in 3D space, or presented in fullscreen mode. Either way, the same compression and encoding requirements apply, and are primarily dictated by the video capabilities of the user's device.

As with image assets, the resolution you should target depends on how much of the screen the video will occupy. If your video is viewed in fullscreen mode, it will be presented in a 16:9 aspect ratio; you will benefit from a 480p or 720p (around 1-3 Mbps) video. If the video is in 3D space, then 240p or 360p (around 200-1000 Kbps) will typically be sufficient unless the video will be viewed close-up.

Video assets may utilize green-screen (chroma key) when available.

Our AR video player does not have the ability to play closed caption files. The video producer must render any captioning directly into the video.

Requirements

- MP4 format (.mp4 file extension)
- H.264 codec
- Fullscreen videos must be of 16:9 aspect ratio
- Maximum total 64MB for all videos in a Bundle

Recommendations

- Limit video clips to 30 seconds to retain user engagement and keep file size manageable.
- Minimize video file size in multiple ways. Contact support@bundlar.com for more specific information about how to reduce your video file size.

Audio Assets

Audio assets are audio clips played during an Augmented Experience either from an audio player located in the 3D space or in a fullscreen media player. We recommend using these types of assets for relaying information.

Audio compression can be done in multiple ways and our requirements are less stringent than with video assets.

Requirements

- MP3 format (.mp3 file extension)

Recommendations

- Limit audio clips to 30 seconds to retain user engagement and keep file size low.

3D Model Assets

3D models are files that are loaded into 3D space. They must be mesh-based models and are limited by polygon count, texture size, and material count.

Because we support a wide array of mobile hardware, it is best to limit the complexity of models. Models labeled as “low-poly” are best suited for use in AR. The polygon/face/triangle count of a model affects both the file size and processor usage on the device. Generally speaking, it is best to keep this count as low as possible to ensure functionality on low-end devices.

Models containing animation are supported, but only certain animation types will function. In particular, skeletal (joint-based) animation works, but blend shapes/morphing do not.

Requirements

- FBX or GLB format (.fbx or .glb file extension)
- Any textures must be embedded (rather than externally referenced)
- On-screen limit of 500k triangles
- Texture images cannot be greater than 4096X4096 combined on a single model

Recommendations

- The lower the triangle count, the better your model will load on low-end devices.
- Reduce your model's file size to achieve better performance. For guidance on how to do this, reach out to support@bundlar.com.
- Use texture files to efficiently color 3D models. Follow these guidelines for texture files:
 - Maximum size: 2048x2048px
 - Texture files must be embedded and cannot be loaded in separately.
 - Adhere to power-of-two sizes (64px, 128px, 1024px, etc.) for textures to allow for slightly faster loading times.

i We can produce your 3D content for an additional fee, but if you would like to purchase models elsewhere for your Bundle project, we recommend the following sites:

- <https://sketchfab.com>
- <https://www.cgtrader.com/>
- <https://www.turbosquid.com/>
- <https://www.renderosity.com/>
- <https://3docean.net/>
- <https://www.highend3d.com/>
- <https://3dexport.com/>

When purchasing models, please ensure they are of a correct polygon count or lower, in the correct format, and licensed correctly for usage in the app. Please contact us if you are unsure.

Button Assets

Buttons are objects that allow for several interactive options for users. A button may open a website, toggle a layer on or off in the Experience, launch a different Experience, or provide a file to view and download. Buttons can be represented in an Experience by a 3D model or an image.

Requirements

- 3D buttons: FBX or GLB format (.fbx or .glb file extension)
- 3D buttons must follow the same requirements as 3D model assets (see section 6).
- Image buttons: PNG or JPEG format (.png or .jpg file extension)
- Image buttons must follow the same requirements as image assets (see section 3).
- For buttons with the “View File” action type, the attached file must be in PDF, PNG, or JPEG format.

FAQ and Troubleshooting

General

My Bundle is very large. What can I do to reduce it?

Consider optimizing your assets. For example: lowering image sizes, 3D model file sizes, and video quality. If your Bundle is still too large, consider reducing its complexity or splitting the Bundle into smaller, more specific Bundles.

Video Assets

How can I reduce the size of my video files for free?

Effective and free compression is available through Google's algorithms or HandBrake, an open-source program. Contact support@bundlar.com for more specific information about how to reduce your video file size.

3D Assets

I purchased a 3D asset online. How can I view and edit it?

Blender is a free, open source 3D editor which can open most 3D file types. It can be downloaded [here](#). It can also be used to export FBX and GLB files for use in the CMS.

Should I use a GLB file or an FBX file?

GLB files are generally preferred for Augmented Reality applications due to faster loading, and allow for more information to be stored in a single file than an fbx. However, GLB exportation may optimize your mesh in ways that make it more difficult to edit later. Exporting a GLB file is recommended when you are ready to use your final product in the CMS. For some 3D editors, a plugin may also be required to export a GLB file, whereas FBX exportation is more widely supported.

What is the difference between a GLB file and a glTF file? Which one do I use?

Both formats are similar, but only GLB files are supported on the CMS. A GLB file is essentially a glTF file with embedded textures.

Why are parts of my GLB mesh black when viewed in the app?

Due to the nature of glTF files, meshes with hard-shaded edges will have their faces split apart. While this does not usually cause a problem visually, it is important to test your model in an Experience before release to ensure the look is correct. If you are seeing unintended black portions in your mesh, open the mesh source file in your 3D editor of choice and convert any quadrangle faces to triangles, then re-export. Alternatively, switching the shading type to smooth or exporting your mesh as an FBX file after checking for duplicate vertices should resolve this issue.

How can I make my 3D asset's file size smaller?

Generally, the lower the polygon count and texture resolution are the smaller the file will be. Contact support@bundlar.com for more specific information about how to reduce your 3D file size.

Why is my 3D model not visible in the scene?

There may be scaling and positioning issues. Import the model into your 3D Editor of choice and ensure the pivot of your object is properly placed.

Why does my model appear much larger or smaller in-app than in the CMS?

The model's center may not be set correctly. Open your model in a 3D editor and ensure all transformations are applied to its pivot. In Blender, you can do this by selecting your model and clicking "**Apply**" > "**All Transformations to Delta**." In Maya, you can do this by selecting your object and clicking "**Modify**" > "**Freeze Transformations**."