USave Documentation

v1.0.0

May 17, 2024

Stylish Esper

Document Version: 1.0.0

Table of Contents

Introducing USave

Your ultimate, cost-free solution for seamless saving and loading in your game development projects. Whether you're a seasoned developer or just starting out, this tool empowers you to effortlessly manage game data with ease.

Save Any Data Type

USave can save and load any serializable data type. With just a single line of code, you can save and retrieve your game data. Here's a simple example demonstrating how easy it is to save and load a float value:

Saving

```
saveFile.AddOrUpdateData("some float", floatValue);
```

Loading

```
float f = saveFile.GetData<float>("some float");
```

However, most Unity types are not savable. USave offers special workarounds for this.

Save Unity Types

If you've tried saving Unity data types into a file, you've probably learned the hard way that they cannot be saved. USave offers workarounds for some of the main data types that developers would need to work with. Here's an example of saving and loading the player's position:

Saving

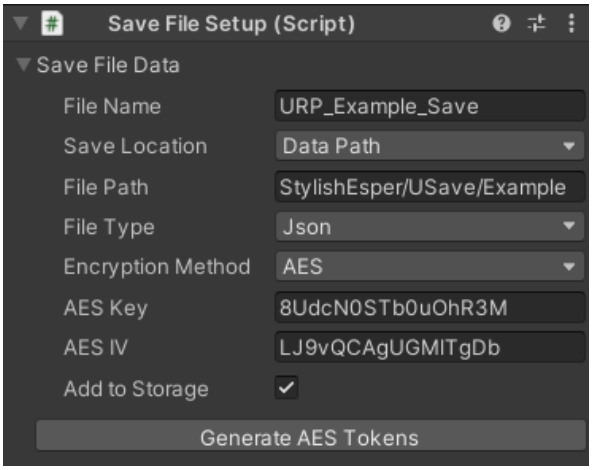
```
saveFile.AddOrUpdateData("PlayerPosition", playerTransform.position);
```

Loading

```
playerTransform.position = saveFile.GetVector3("PlayerPosition");
```

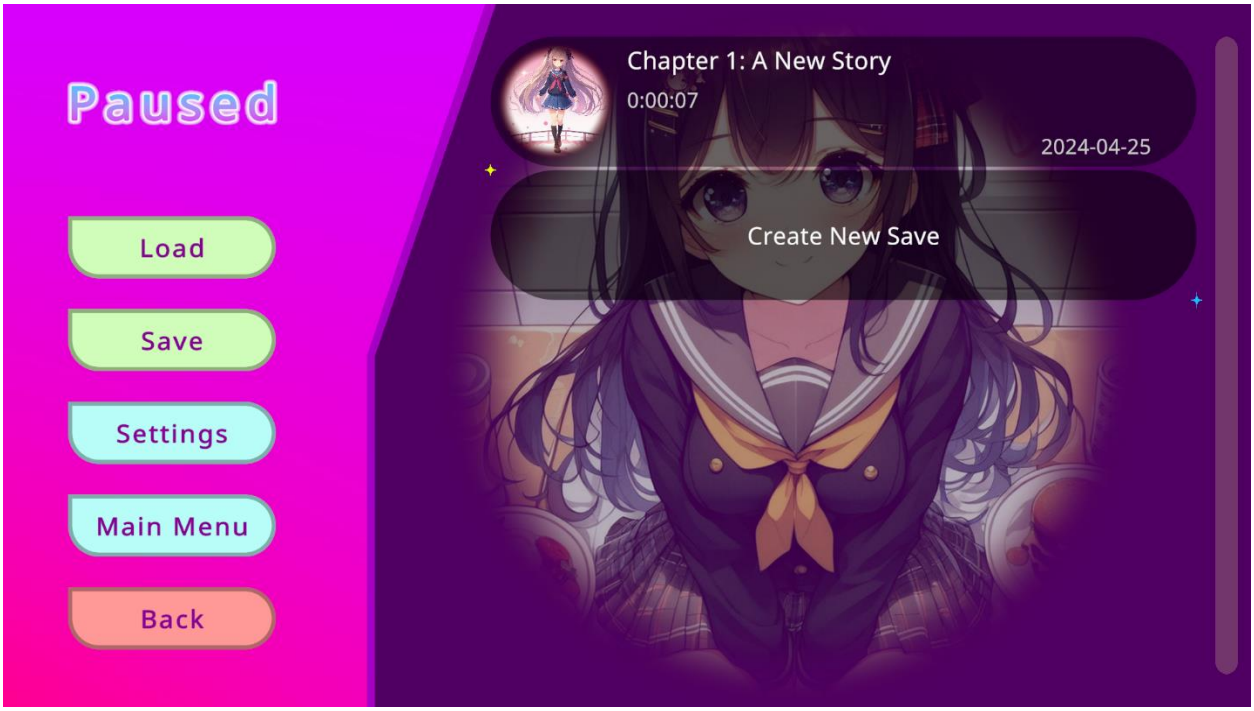
Encryption

Utilize the AES algorithm to encrypt every save (or just the ones you choose)!



Infinite Saves

Ever wondered how modern games support infinite save states? USave supports any number of saves, even allowing the player to create new saves during runtime with its file-based structure.



Setting this up for your own Unity game has become as easy as ever!

Installation

Asset Store

You can find the latest version of USave in the asset store with this link.
Installation Steps:

1. Get USave from the asset store.
2. Open your Unity project, go into `Window -> Package Manager`, switch to `My Assets` from the packages dropdown at the top-left, and then type `USave` in the search bar.
3. Download and install the package.
4. Once it's complete, a package installer window will popup. Click `Install Newtonsoft JSON`.

Github

You can find the latest version of USave on GitHub with this link.
Installation Steps:

1. Download one of the `.unitypackage` files from the releases page.
2. Open your Unity project and double click the downloaded Unity package.
3. Click `import`.
4. Once it's complete, a package installer window will popup. Click `Install Newtonsoft JSON`.

Once you've got it installed, familiarize yourself with the tool by reading the startup guide.

Example Setup

You can find the example scene that works with any render pipeline in `Assets/USave/Examples/Any RP Example`.
If you'd like to try the URP example, you can import the assets from the `URP_Example.unitypackage` in `Assets/USave/Examples`.

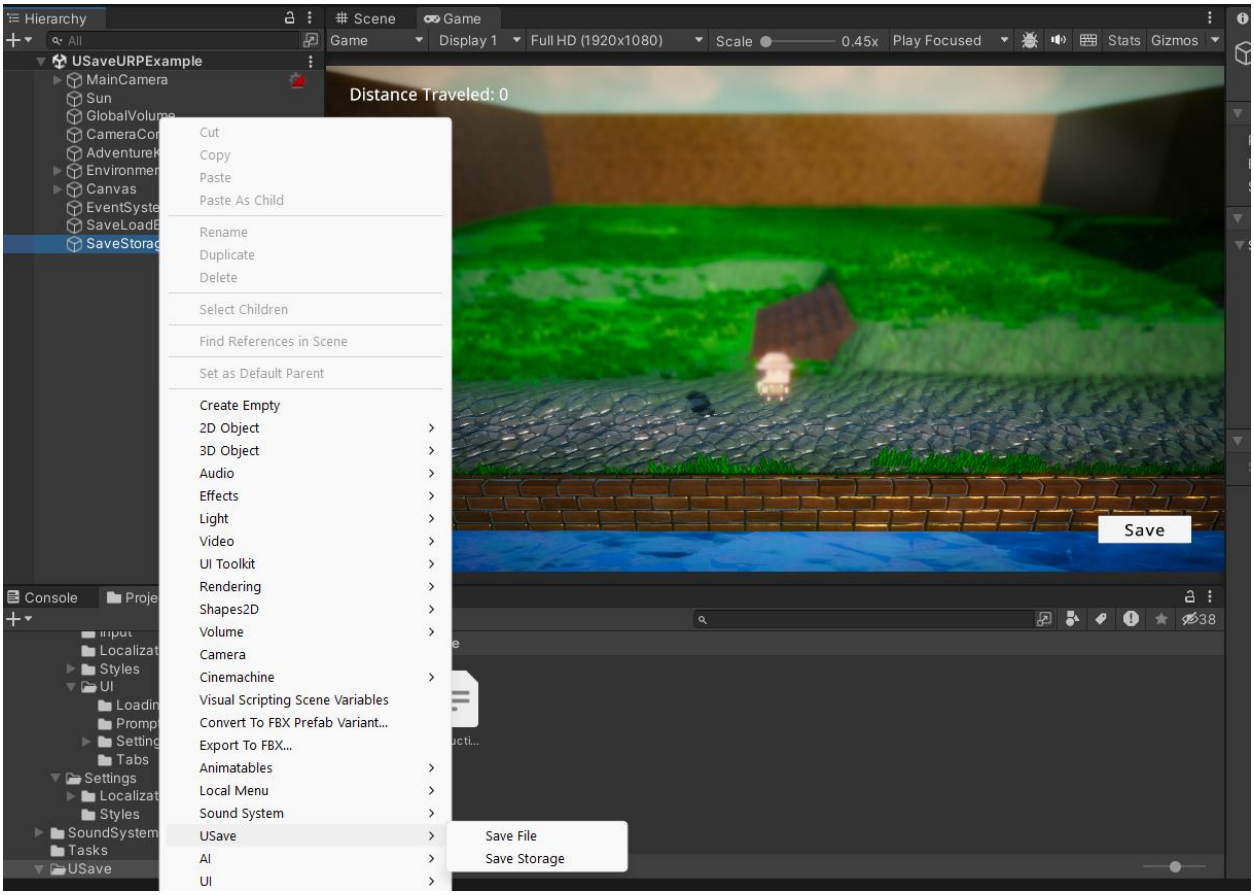
Components

File Structure

Save data is typically stored in separate files, with one for each save state and one for the player's settings. USave is structured around this idea, which is why it's an important concept to remember.

Separating your saved data is recommended. Having all of the player's data in one file is possible and very common, but it's not a requirement. For example, you could have one save file that stores the player's inventory data, one for storing the player's progress, and another for the environmental impacts they made.

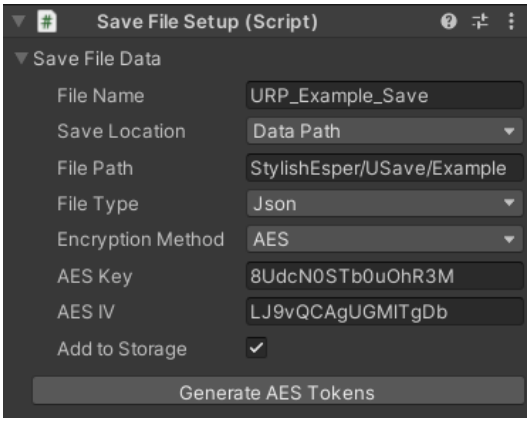
Create Menu Items



You can easily create USave's save file setup and save storage components by right-clicking on the hierarchy and navigating to USave.

Save File Setup

Save file setup is the main component you will be working with. This component will work exactly as it's named; it will create a save file in the user's system that you can save and load data from.



File Name
The name of the file that will be saved in the player's system.

Save Location
There are 2 common locations that you can store player files.

1. **Persistent Data Path:** a directory path where data expected to be kept between runs can be stored.
2. **Data Path:** the path to the game data folder on the target device.

File Path
This is the extra path after the save location path. For example, in the above image, the file `URP_Example_Save` will be stored in the path `StylishEsper/USave/Example` in the game's data folder.

File Type
The file type determines the saved data format and the file extension. Currently, only the JSON format is supported.

Encryption Method
Only the AES encryption algorithm is supported at this time. The default option is no encryption.

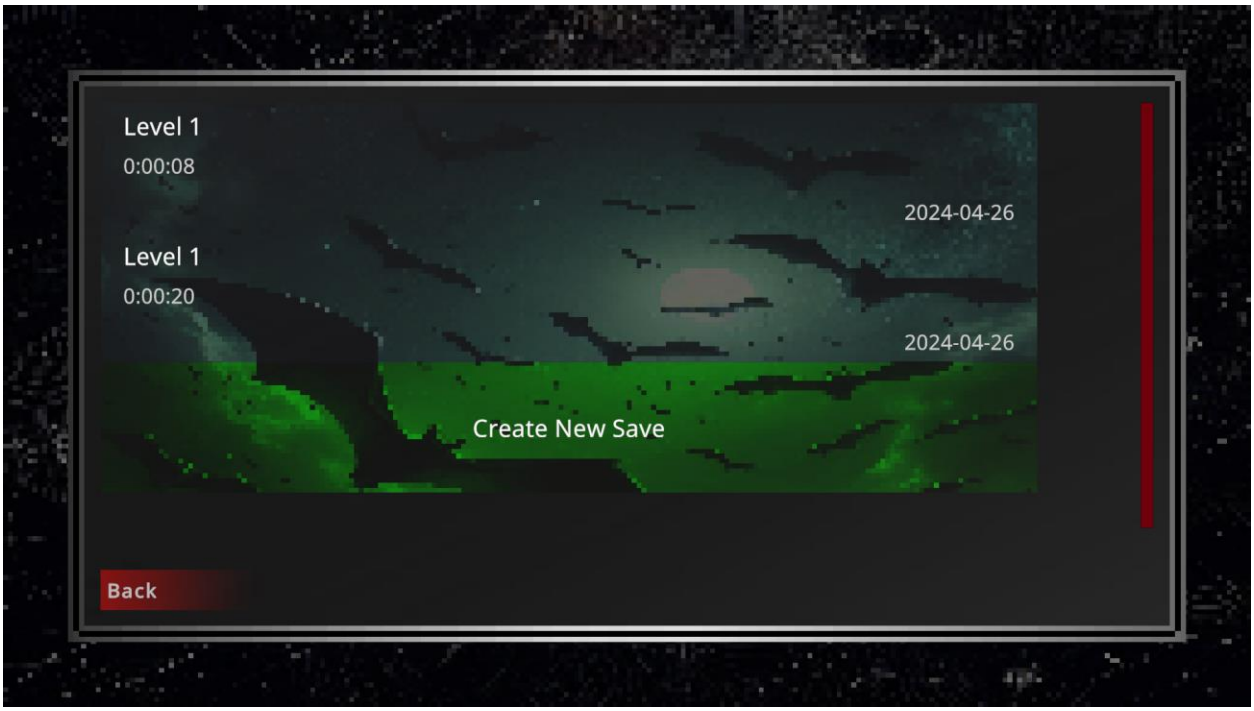
AES Key and IV
The key and IV are used for the AES algorithm. You can click the 'Generate AES Tokens' button to generate a random token for both.

Add to Storage
If add to storage is checked, the save file will be added to the save storage.

Save Storage
Save storage is a singleton component that has no inspector properties. Save storage automatically stores the paths of every save file that has 'Add to Storage' checked. It requires a save file setup component to store the paths.

Ensure the 'Add to Storage' box is unchecked for Save Storage's save file setup component.

With this component, you can find any save (that has the 'Add to Storage' value checked) by its file name through code.



Save storage isn't a mandatory component, but having it can significantly simplify tasks like accessing all of a player's saves, particularly useful for games featuring a save list screen.

Saving

1. Getting the Save File

The first step to saving data is getting the save file. This can be done by getting the save file setup component first, which will give you access to the save file with `SaveFileSetup.GetSaveFile`.

```
saveFileSetup = GetComponent<SaveFileSetup>();
saveFile = saveFileSetup.GetSaveFile();
```

It's recommended to use this code in Awake or Start.

2. Saving Data

Each piece of data in a save file has an ID (string). This makes it possible to retrieve specific data by ID. Saving data can be done with a single line with `SaveFile.AddOrUpdateData`.

```
saveFile.AddOrUpdateData("DataID", data);
```

The first parameter is the ID of the data, and the second parameter is the data itself. Any serializable data type can be saved. However, most Unity types are not savable. USave can save

common Unity data types, including (but not limited to) Vector2, Vector3, Quaternion, Color, and Transform.

Loading

1. Getting the Save File

Just like saving, you need a reference to a save file to load data.

```
saveFileSetup = GetComponent<SaveFileSetup>();
saveFile = saveFileSetup.GetSaveFile();
```

2. Saving Data

Each USave method that loads data only accepts one parameter, which is the ID of the data.

GetData

The main method to load data is `SaveFile.GetData`. This method accepts any type parameter.

```
// Where T is the data type
T data = saveFile.GetData<T>("DataID");
```

You can also retrieve a list of data of the same type:

```
// Where T is the data type
List<T> dataList = saveFile.GetData<T>("DataID", "DataID2",
"DataID3");
```

Special Methods

USave features special methods to retrieve data for some Unity types.

Vector2

```
Vector2 v2 = saveFile.GetVector2("DataID");
```

Vector3

```
Vector3 v3 = saveFile.GetVector3("DataID");
```

Quaternion

```
Quaternion q = saveFile.GetQuaternion("DataID");
```

Color

```
Color c = saveFile.GetColor("DataID");
```

Transform

```
// Returns a SavableTransform
SavableTransform st = saveFile.GetVector2("DataID");

// Use Transform.CopyTransformValues to set values from a
// SavableTransform to a Transform
```

```
transform.CopyTransformValues(st);
```

Example

This script saves the player's transform values when the game is exited and loads the transform values on start.

When saving a transform with USave, only the position, rotation, and scale properties are saved.

```
using UnityEngine;

public class SaveLoadExample : MonoBehaviour
{
    // Const data ID
    private const string playerTransformDataKey = "PlayerTransform";

    [SerializeField]
    private Transform playerTransform;

    private SaveFileSetup saveFileSetup;
    private SaveFile saveFile;

    private void Start()
    {
        // Get save file component attached to this object
        saveFileSetup = GetComponent<SaveFileSetup>();
        saveFile = saveFileSetup.GetSaveFile();

        // Load game
        LoadGame();
    }

    /// <summary>
    /// Loads the game.
    /// </summary>
    public void LoadGame()
    {
        // Check if the data exists in the file
        if (saveFile.HasData(playerPositionDataKey))
        {
            // Get Vector3 from a special method because Vector3 is
not savable data
            var savableTransform =
saveFile.GetTransform(playerPositionDataKey);
            playerTransform.CopyTransformValues(savableTransform);
        }

        Debug.Log("Loaded game.");
    }

    /// <summary>
```

```
    /// Saves the game.
    /// </summary>
    public void SaveGame()
    {
        saveFile.AddOrUpdateData(playerPositionDataKey,
playerTransform);
        saveFile.Save();

        Debug.Log("Saved game.");
    }

    private void OnApplicationQuit()
    {
        SaveGame();
    }
}
```