Asset Dependencies

The following scripting define symbols are used to add ***paid*** or ***non-distributable*** asset add-on features to MRET. These symbols are automatically added to the project settings in the editor upon detection of the script assets and are managed using Unity's ConditionalCompilationUtility (CCU). Please download and configure the CCU prior to opening MRET in Unity for the first time. Refer the installation instructions in the Release Guide distributed with MRET for more information. The CCU is located here:

> https://github.com/Unity-Technologies/ConditionalCompilationUtility/tree/f364090bbda3728e1662074c969c2b7c3c34199b

The MRET assembly definition is defined here:

```
Assets/MRET/Core/Editor/MRETExtensionSymbols.cs
```

The add-on dependency feature set is broken into several groups: automatic, recommended, and optional. They are defined as follows:

AUTOMATIC

- SicCity GLTFUtility

  URL: https://github.com/Siccity/GLTFUtility
  Symbol: MRET_EXTENSION_SICCITYGLTF
  Description: Used for loading GLTF files at MRET runtime
  Scoped Registry:

  ```
  "scopedRegistries": [
     {
        "name": "Siccity",
        “url”: “https://github.com/siccity/gltfutility.git”,
        "scopes": [
           "com.siccity.gltfutility"
        ]
     },
  ]
  ```
- Newtonsoft JSON

  URL: https://www.newtonsoft.com/json
  Symbol: MRET_EXTENSION_NEWTONSOFTJSON
  Description: Used for JSON serialization. This is primarily used for storing and retrieving client and server certs and for parsing IoT telemetry.
- Virtual Data Explorer (VDE)
  - **URL:** https://coda.ee/vde
  - **Symbol:** MRET_EXTENSION_VDE

- **Description:** Visualize and explore your computer network topology as a set of 3D data-shapes in MRET. Included as part of the standard MRET distribution.

RECOMMENDED

- Digital Ruby Free Earth Planet

  URL: https://assetstore.unity.com/packages/vfx/shaders/free-earth-planet-the-best-planet-shader-in-the-asset-store-56841
  Symbol: MRET_EXTENSION_DIGITALRUBYEARTH
  Description: Scripts support low tessellation sphere primitives and planets and provides textures/materials/shaders for a low-resolution Earth. If not added to MRET, predefined Earth and other prefabs that use low tessellation sphere meshes will not be available and errors may ensue for some MRET projects.

- Dummiesman Runtime OBJ Importer

  URL: https://assetstore.unity.com/packages/tools/modeling/runtime-obj-importer-49547#content
  Symbol: MRET_EXTENSION_OBJIMPORTER
  Description: Used for loading the SteamVR controller model in the Cross-Platform Input System (CPIS)
  Notes: This software has not been maintained but it still works with Unity. It does not work as is with the HDRP nor URP render pipelines. The following edits are required:

  MTLLoader.cs
  Add this method:

```
/// <summary>
/// Obtains the default material depending on the defined render pipeline
/// </summary>
/// <returns>The <code>Material</code> reference or NULL if not defined</returns>
protected Material GetRenderPipelineMaterial()
{
    Material result = null;

    if (QualitySettings.renderPipeline != null)
    {
        result = QualitySettings.renderPipeline.defaultMaterial;
    }
    else if (GraphicsSettings.defaultRenderPipeline != null)
    {
        result = GraphicsSettings.defaultRenderPipeline.defaultMaterial;
    }

    return result;
}
```

MTLLoader:

Modify this method:

```
public Dictionary<string, Material> Load(Stream input)
[
…….
    //newmtl
    if (splitLine[0] == "newmtl")
    {
        string materialName = processedLine.Substring(7);

        Material newMtl = GetRenderPipelineMaterial();
        try
        {
            newMtl = new Material(newMtl.shader) { name = materialName };
        }
        catch (System.Exception)
        {
            newMtl = null;
        }

        if (newMtl != null)
        {
            mtlDict[materialName] = newMtl;
            currentMaterial = newMtl;
        }

        continue;
………
    //diffuse
        var KdTexture = TryLoadTexture(texturePath);
        currentMaterial.SetTexture("_BaseMap", KdTexture);
……..
    //specular map
    if (splitLine[0] == "map_Ks" || splitLine[0] == "map_ks")
    {
        string texturePath = GetTexPathFromMapStatement(processedLine, splitLine);
        if (texturePath == null)
        {
            continue; //invalid args or sth
        }

        currentMaterial.SetTexture("_SpecGlossMap", TryLoadTexture(texturePath));
        currentMaterial.SetFloat("_WorkflowMode", 0);
        continue;
    }
```

- Microsoft Mixed Reality Toolkit (MRTK) Foundation 2.8.3

  URL: https://github.com/microsoft/MixedRealityToolkit-Unity/releases
  Symbol: MRET_EXTENSION_MRTK
  Description: A set of foundational components and features to accelerate mixed reality app development in Unity. Not currently used for the Windows standalone version of MRET, but required for the HoloLens 2/UWP
- Microsoft Mixed Reality OpenXR 1.8.1

  URL: https://github.com/microsoft/MixedRealityToolkit-Unity/releases
  Symbol: MRET_EXTENSION_MROPENXR
  Description: Extension to Unity OpenXR Plugin to support a suite of features for HoloLens 2 and Windows Mixed Reality headsets.

OPTIONAL

- BestHTTP

  URL: https://assetstore.unity.com/packages/tools/network/best-http-2-155981
  Symbol: MRET_EXTENSION_BESTHTTP
  Description: Used only by Virtual Data Explorer (VDE) to support communication with the backend and for synchronization of user sessions.
- Chart and Graph

  URL: https://assetstore.unity.com/packages/tools/gui/graph-and-chart-78488
  Symbol: MRET_EXTENSION_CHARTANDGRAPH
  Description: Supports plotting of data points stored in the MRET DataManager
- Easy Build System

  URL: https://assetstore.unity.com/packages/templates/systems/easy-build-system-45394
  Symbol: MRET_EXTENSION_EASYBUILDSYSTEM
  Description: Supports optional alignment/snapping of scene objects in MRET to other scene objects
- FinalIK

  URL: https://assetstore.unity.com/packages/tools/animation/final-ik-14290
  Symbol: MRET_EXTENSION_FINALIK
  Description: Adds low-fidelity IK to MRET, including avatars and robotic arms (See RosSharp)
- OSGeo GDAL

  URL: https://gdal.org
  Symbol: MRET_EXTENSION_GDAL
  Description: Used for Geospatial processing, specifically converting DEMs to 3D terrains
  Scoped Registry:

  ```
  "scopedRegistries": [
     {
        "name": "package.openupm.com",
        "url": "https://package.openupm.com",
  ```

```
            "scopes": [
               "com.openupm",
               "com.virgis"
            ]
         },
      ]
```

- M2MQTT

  nuget> Install-Package M2Mqtt
  Symbol: MRET_EXTENSION_M2MQTT
  Description: Adds in scene object association with NASA IoT sources into MRET

- Microsoft .NET JSON

  URL: https://www.nuget.org/packages/System.Text.Json/
  Symbol: MRET_EXTENSION_SYSTEMTEXTJSON
  Description: Used for JSON serialization. If present in the project, this JSON serialization will be used in place of the NewtonSoft JSON because of its high-performance and low memory allocation. It is not available as a Unity asset/plugin but is possible to get it to work with Unity. It is included as part of the Siemens RosSharp distribution.
- NonConvexMeshCollider

  URL: https://assetstore.unity.com/packages/tools/physics/non-convex-mesh-collider-84867
  Symbol: MRET_EXTENSION_NONCONVEXMESHCOLLIDER
  Description: Supports optional non-convex colliders for scene object in MRET
- MGear Point Cloud Viewer and Tools

  URL: https://assetstore.unity.com/packages/tools/utilities/point-cloud-viewer-and-tools-16019#content
  Symbol: MRET_EXTENSION_POINTCLOUDVIEWER
  Description: Currently used to load static point clouds in MRET from a file.
- RockVR Video Capture

  URL: https://assetstore.unity.com/packages/tools/video/video-capture-75653
  Symbol: MRET_EXTENSION_ROCKVR
  Description: Supports optional interactive video capture recording during runtime of MRET
- Siemens RosSharp

  URL: https://github.com/siemens/ros-sharp/tree/master/ROS
  Symbol: MRET_EXTENSION_ROSSHARP
  Description: Provides low-fidelity IK solutions for robotic arms in MRET using FinalIK
- TerrainTools

  Unity Preview Package:
  https://docs.unity3d.com/2020.3/Documentation/Manual/terrain-Tools.html
  Symbol: MRET_EXTENSION_TERRAINTOOLS
  Description: Supports dynamic terrain creation
- Vuplex 3D Webview

  URL: https://developer.vuplex.com/webview/overview

Symbol: MRET_EXTENSION_VUPLEX
Description: Add in a 2D/3D HTML browser into MRET

DEPRECATED

- UnityOctree
  URL: https://github.com/Nition/UnityOctree.git
  Symbol: MRET_EXTENSION_UNITYOCTREE
  Description: Used during investigation of octrees for a point cloud implementation. Not currently used.