Spatial Favicon Sizes

Problem

- What is the ‘size’ analogous for spatial icons ?
  - Traditionally for 2D images, ‘size’ are used as a ‘hint’ on quality.
- How do we compute/interpret ‘size’ for spatial icons ?

Static Bounding Box

- A glTF asset's "static" bounding box can be used to represent size of the icon.
- "Static" - implies: no animation, no morph targets, 'bind pose' bounding box.
- As per standards all distances in glTF are in meters, but in practice all platforms interpret them as a 'unit' and scale the asset appropriately.
    - On MagicLeap a bounding box of {0.0, 0.0, 0.0} - {1.0, 1.0, 1.0} has 1:1 scale and rendered as 1 meter cube in physical world coordinates.
    - The same bounding box on 3js is rendered based on camera, viewport settings. They are scaled consistently across all other assets in the scene.

Static Bounding Box - Continued

- Can ‘Static Bounding Box’ be a fair estimation of LoD ? - May be
  - A poly count is the best estimation of LoD.
  - But.... Consider a case of a spatial icon having a Head and Torso. The combined bounding box of Head + Torso will be greater than a Head only bounding box.
- There is a FB extension in glTF that uses this metric for high level estimation of LoD.
  - https://github.com/KhronosGroup/glTF/blob/master/extensions/2.0/Vendor/FB_geometry_metadata/README.md

Static Bounding Box - Pros/Cons

- Pros:
  - No changes to spec.
  - Analogous to size w/ 2D image.
- Cons:
  - Non trivial calculation. Must go through all meshes, apply local transforms, apply node level transforms and then make a union of all bounding boxes of all the nodes.
  - Currently there is no tool to calculate this. (But can be provided)

Alternatives

- A new attribute called “lod” with string values: “low/medium/high” provided by the author.
  - Needs spec changes, authors can interpret them differently.
- Re-use ‘size’ attribute to with ‘vertex count x primitive count’ as corresponding values ?
  - A mismatch in attribute name and the value it represents.
- Extension: MSFT_lod: https://github.com/KhronosGroup/glTF/blob/master/extensions/2.0/Vendor/MSFT_lod/README.md
  - Packages all lods into same asset, not useful for our case, where we need to determine which asset to download.

Updates

- WebApp manifest addition: Issue here: https://github.com/w3c/manifest/issues/763
  - Authors are fine with just using appropriate mime type for spatial icons.