Displaying Protein's in the Browser

Problems with Current Solutions

- Not high speed
- Requires loading applications on the desktop
- Jmol is not fast enough nor detailed enough
- Go to WebGL

WebGL in Browsers

- Chrome, Firefox and Internet support WebGL today

- Safari can display WebGL with a menu option

3D Needs a Transmission Format!

- **Compression and streaming of 3D assets becoming essential**
  - Mobile and connected devices need access to increasingly large asset databases
- **3D is the last media type to define a compressed format**
  - 3D is more complex – diverse asset types and use cases
- **Needs to be royalty-free**
  - Avoid an 'internet video codec war' scenario
- **Eventually enable hardware implementations of successful codecs**
  - High-performance and low power – but pragmatic adoption strategy is key

Audio	Video	Images	3D
MP3	H.264	JPEG	?
napster	YouTube	facebook	!

An effective and widely adopted codec ignites previously unimagined opportunities for a media type

© Copyright Khronos Group 2013 - Page 2

glTF Goals

- **Binary file format for efficient transmission for 3D assets**
  - Reduce network bandwidth *and* minimize client processing overhead
- **Run-time neutral - DO NOT IMPLY OR MANDATE ANY RUN-TIME BEHAVIOR**
  - Can be used by any app or run-time – *usually* WebGL accelerated
- **Scalable to handle compression and streaming**
  - Though baseline format does not include compression
- **'Direct load efficiency' for WebGL**
  - Little or NO processing to drop glTF data into WebGL client
- **Carry conditioned data from any authoring format**
  - Prototyping and optimizing efficient handling of COLLADA assets

A standards-based content pipeline for rich native and Web 3D applications

© Copyright Khronos Group 2013 - Page 3

GLTF Problems

- Tried the GLTF format at first
- Too early in the development cycle to make a real example
- Vertex Coloring did not work
- Compression technology was non-existant
- Check back in a year

OpenCTM

- Lossless or Lossy Compression
- Supported in major WebGL libraries already
- More Mature. In development since 2009
- Has support for PLY which we can already natively export

Compression

	1STP	3WMO	4B3Y	3J3Q
Residue Count	159	61	3089	231
HTML	.05 MB	.27 MB	.4 MB	18.1 MB
Collada	.04 MB	.48 MB	.73 MB	27.85 MB
OBJ	.03 MB	.34 MB	.5 MB	36.8 MB
OpenCTM	.00 MB	.02 MB	.03 MB	2.05 MB

OpenCTM Problems

- Not an Industry Standard
- Developed by 1 person rather than an industry consortium like GLTF
- Vertex Coloring