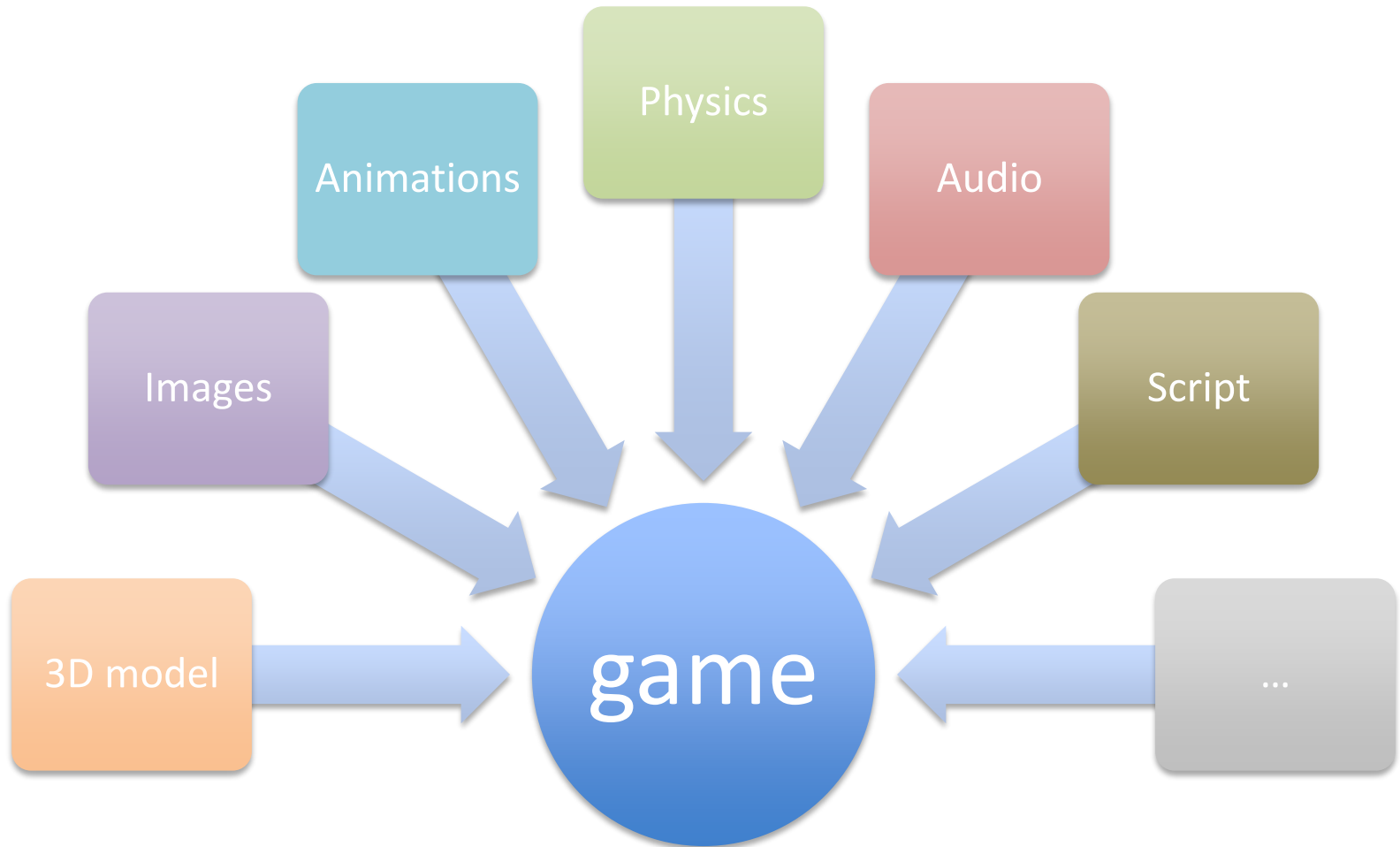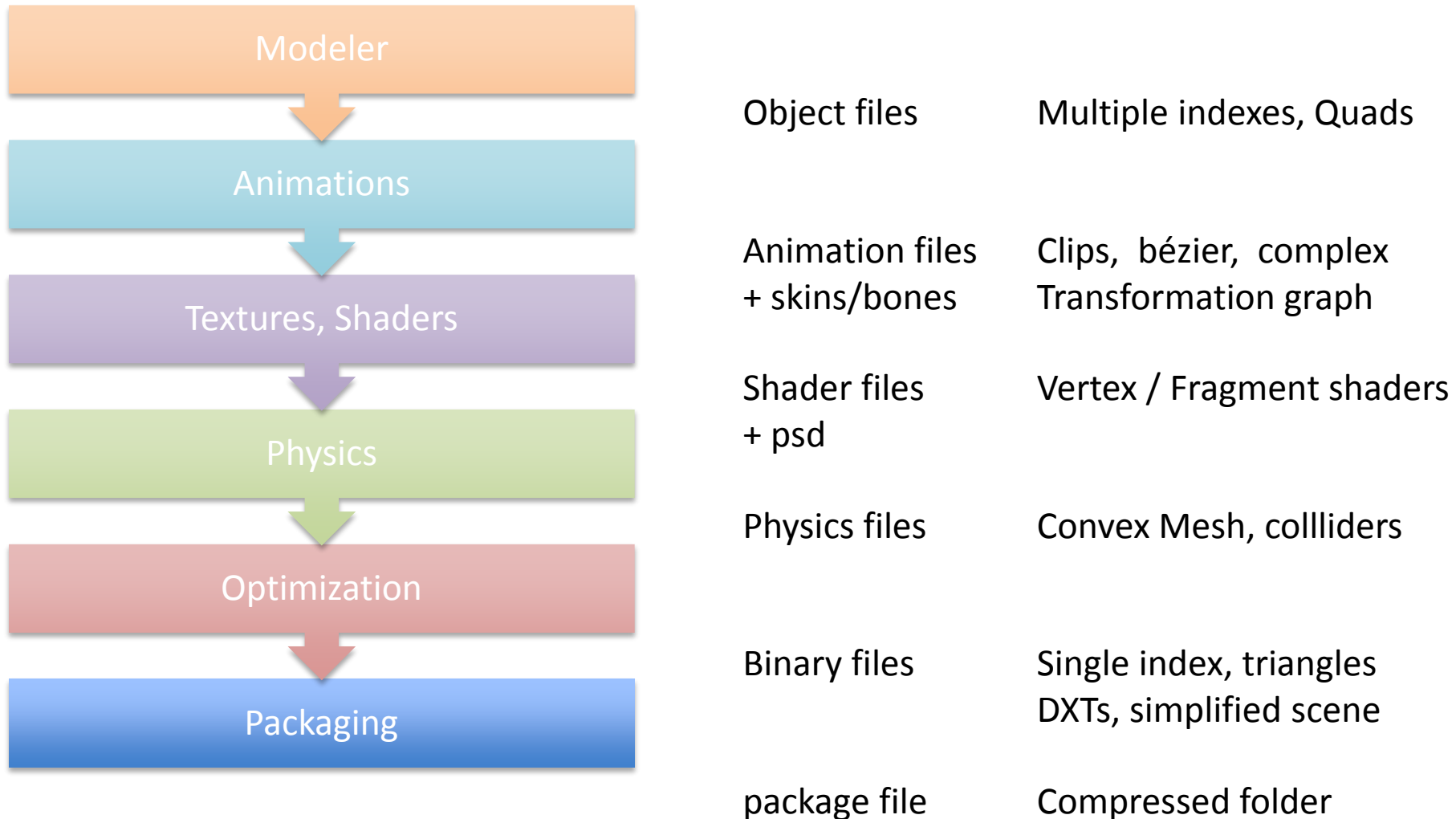# COLLADA to WebGL

Experimenting using COLLADA to bring content from Unity to WebGL using Turbulenz and Fl4re exporter

Rémi Arnaud

remi@acm.org
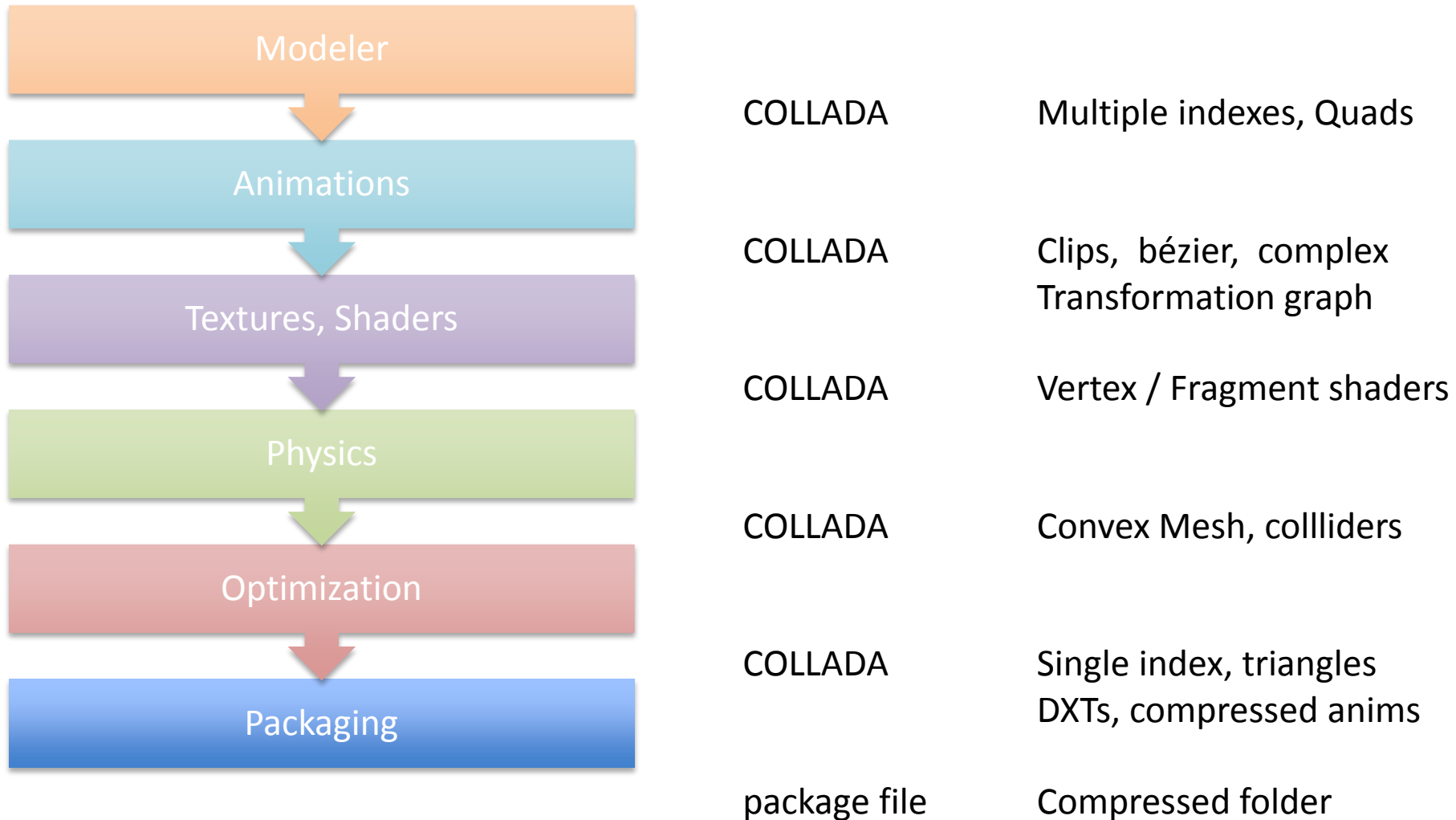
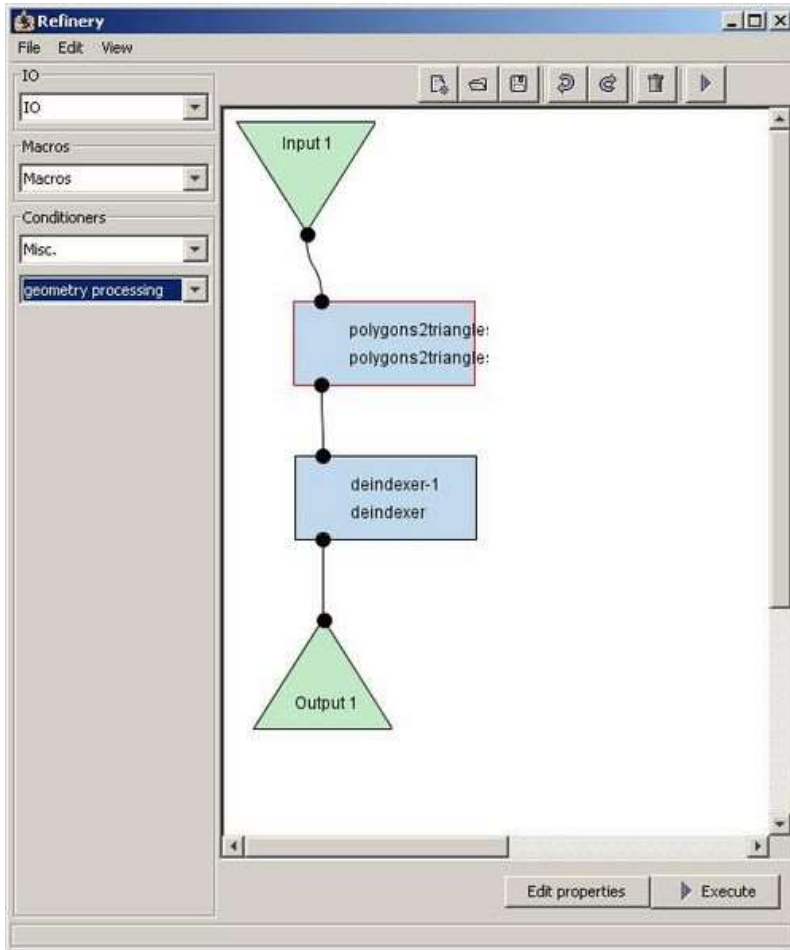# Content creation

Content 'Pipeline'

Modeler

→

Animations

→

Textures, Shaders

→

Physics

→

Optimization

→

Packaging

Object files — Multiple indexes, Quads

Animation files + skins/bones — Clips, bézier, complex Transformation graph

Shader files + psd — Vertex / Fragment shaders

Physics files — Convex Mesh, collliders

Binary files — Single index, triangles DXTs, simplified scene

package file — Compressed folder

COLLADA – intermediate format

Modeler		
↓	COLLADA	Multiple indexes, Quads
Animations		
↓	COLLADA	Clips, bézier, complex Transformation graph
Textures, Shaders		
↓	COLLADA	Vertex / Fragment shaders
Physics		
↓	COLLADA	Convex Mesh, collliders
Optimization		
↓	COLLADA	Single index, triangles DXTs, compressed anims
Packaging		
	package file	Compressed folder

COLLADA Refinery (2007)

COLLADA Refinery 2.0.3 conditionners

Axisconverter
Compress Transforms
Stipper
Image conversion
Axis transform
Coherencytest ** Use this !!
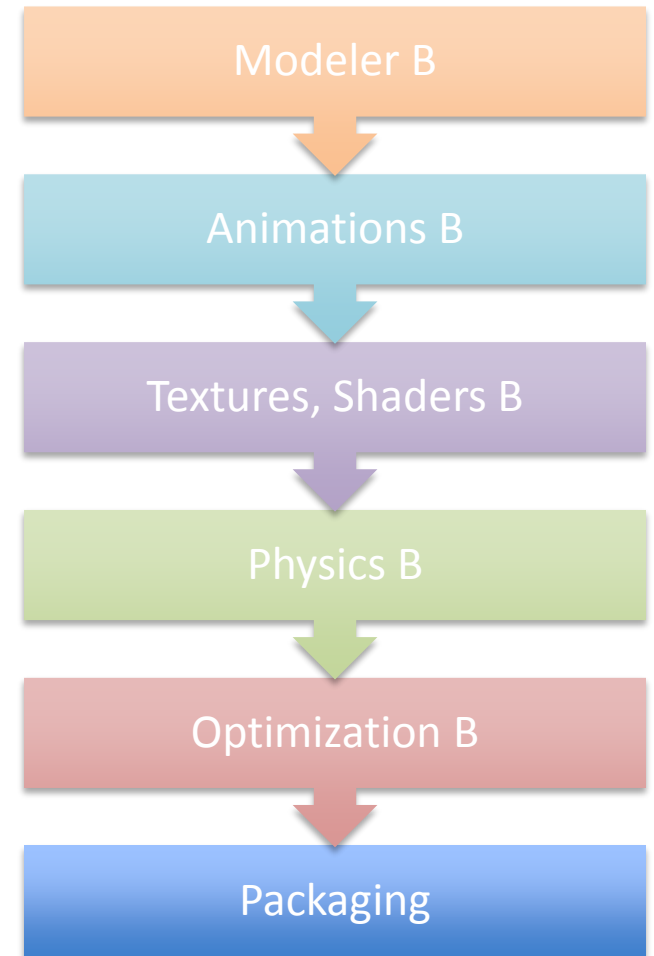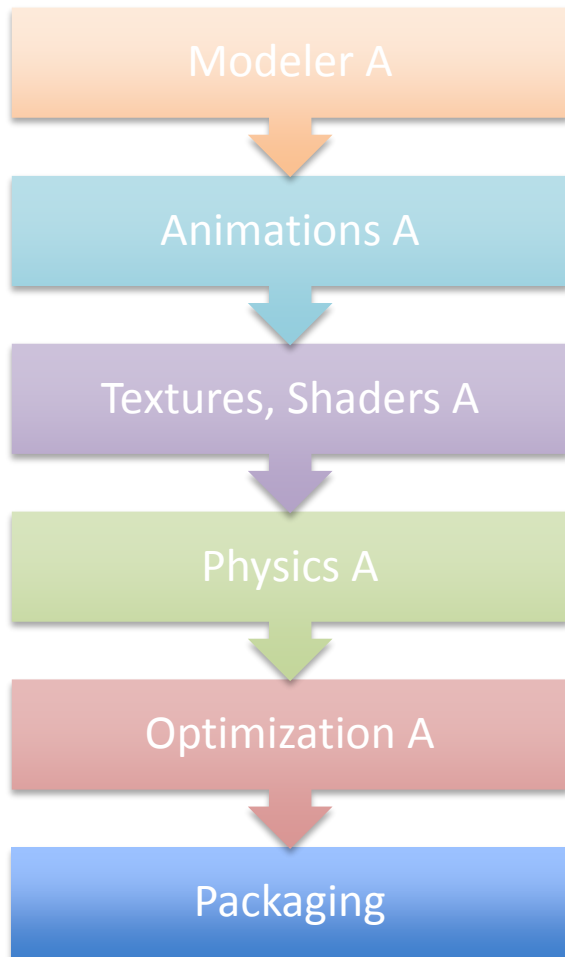Copyrighter
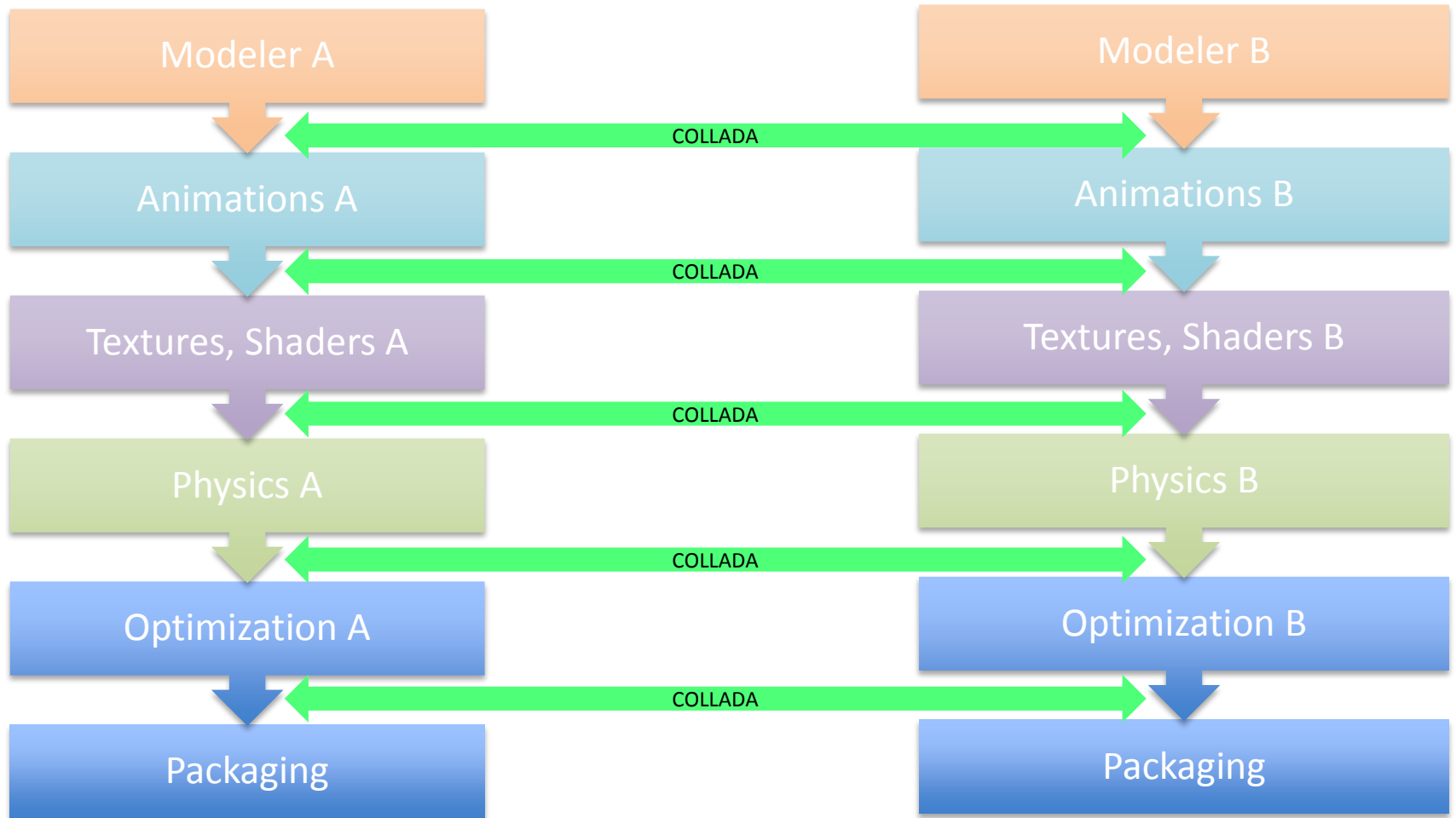Deindexer
Triangulate
Vertex cache optimization
Optimizer
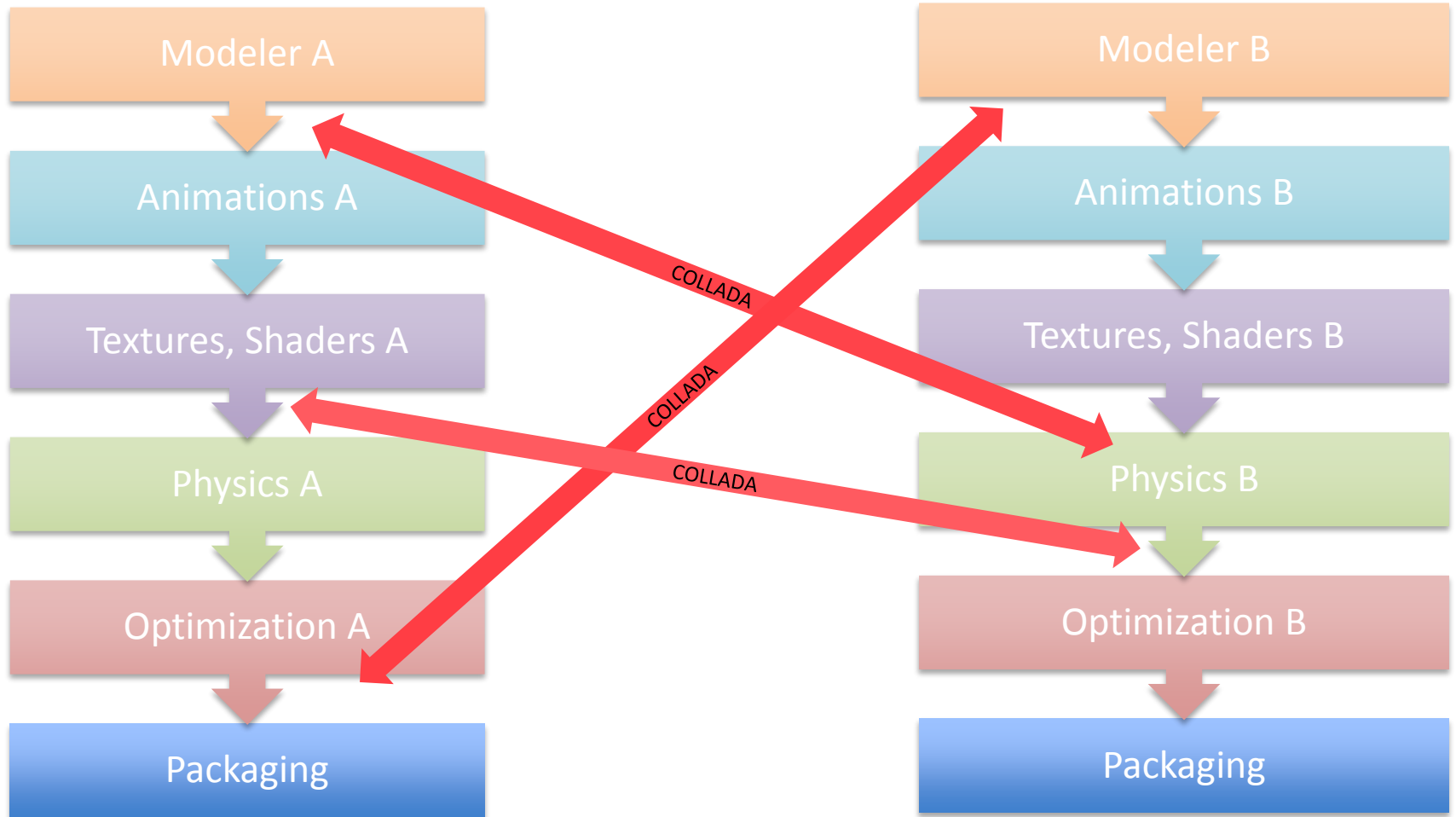Packager

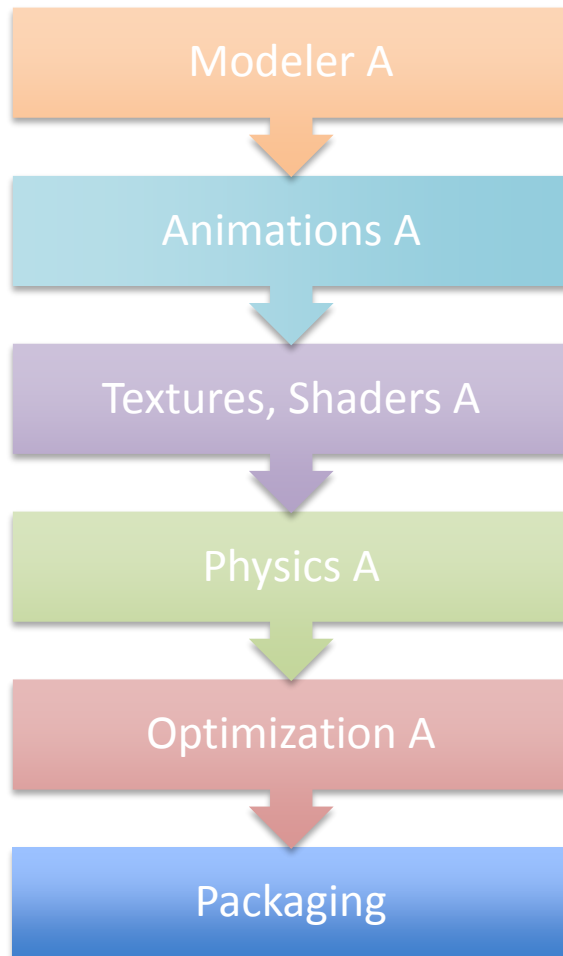https://collada.org/mediawiki/index.php/COLLADA_Refinery
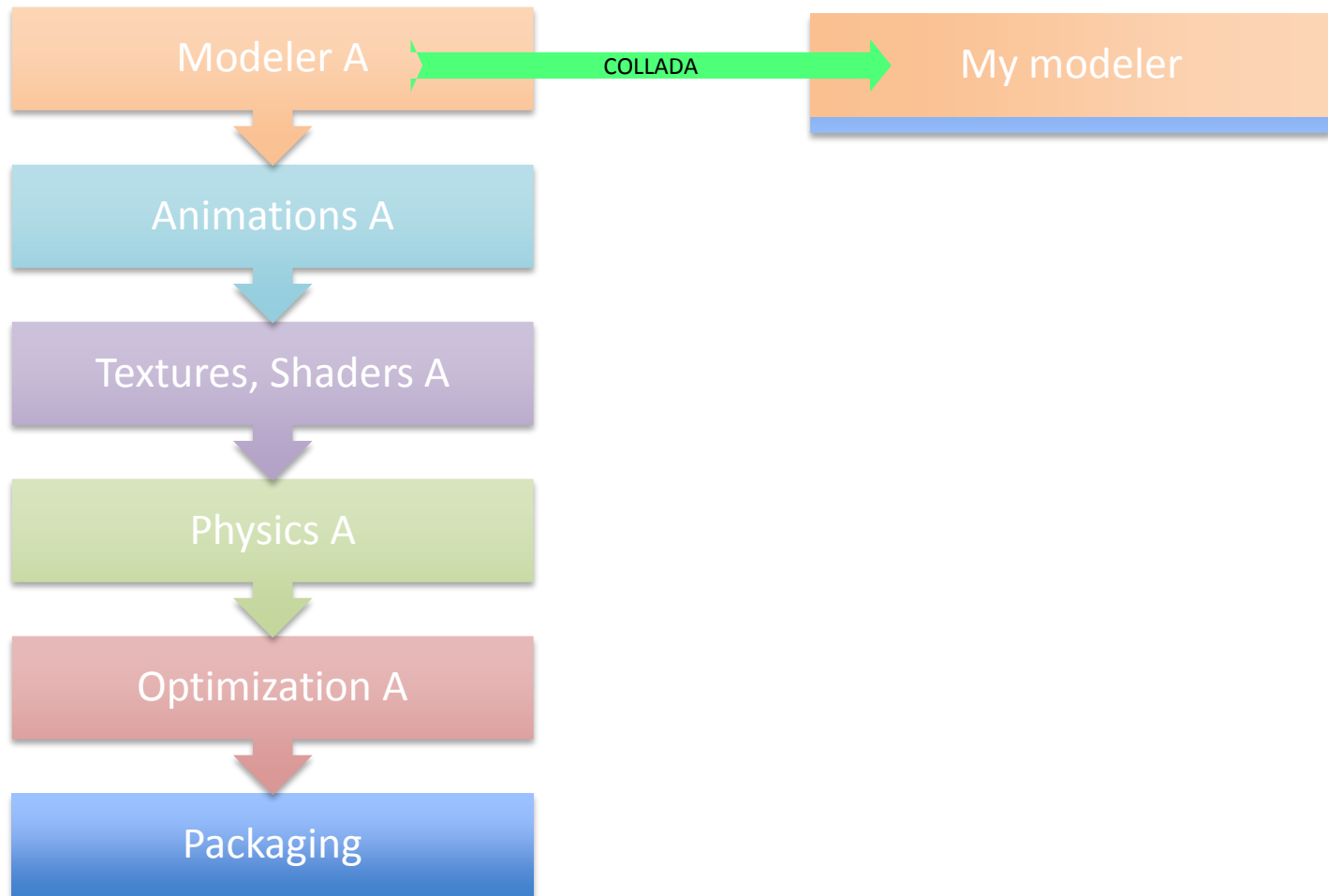
COLLADA interchange?

COLLADA interchange?

COLLADA interchange?

COLLADA loader?

COLLADA loader?

Modeler A → COLLADA → My modeler

Modeler A
↓
Animations A
↓
Textures, Shaders A
↓
Physics A
↓
Optimization A
↓
Packaging

COLLADA loader?

Modeler A

Animations A

Textures, Shaders A

Physics A

Optimization A

Packaging

COLLADA

Polygons
   multiple indexes
      image format
         mesh optimization, split
            complex transform hierarchy
            no shader programs
               no collision volumes
                  verbose text (xml) parsing

My game

COLLADA – more tools available?

Modeler

| Max | Maya | Blender | Modo | Cinema4D | XSI |

Animations

| Poser | DAZ | Mixamo |

Textures, Shaders

| Photoshop | FX Composer | Render Monkey |

Physics

| Bullet | PhysX | Havok |

Optimization

| Simplygon | Okino | Atangeo | MeshLab |

Packaging

WebGL packaging

Unity Editor

Fbx or simple COLLADA (e.g. no physics, morphing, shaders..)

| Max | Maya | | | Modo | Cinema4D | XSI |

Animations

Mecanim

Textures, Shaders

Shader Factory

Physics

PhysX

Optimization

Built-in

Packaging

IOS, Andoid, PC, Web (plugin), Flash

?WebGL?

Unity Engine

Content pipeline

http://unity3d.com/

Turbulenz SDK (WebGL)

Modeler

Max	Maya	Blender	Modo	Cinema4D	XSI

Animations

Poser	DAZ	Mixamo

Textures, Shaders

Photosho   Monkey

Imports COLLADA with physics

Physics

Bullet	hysX	Havok

Optimization

dae2json

Packaging

json2tar , mapping.json, cgfx2json

WebGL Turbulenz engine

http://biz.turbulenz.com/developers

Unity Editor -> WebGL Turbulenz using COLLADA !

Modeler	Editor	Exporter	Converter	webG L engine
Max Maya Blender ...	Unity	COLLADA	dae2json	Turbulenz

http://u3d.as/content/fl4re/collada-dae-exporter-for-unity/3cC
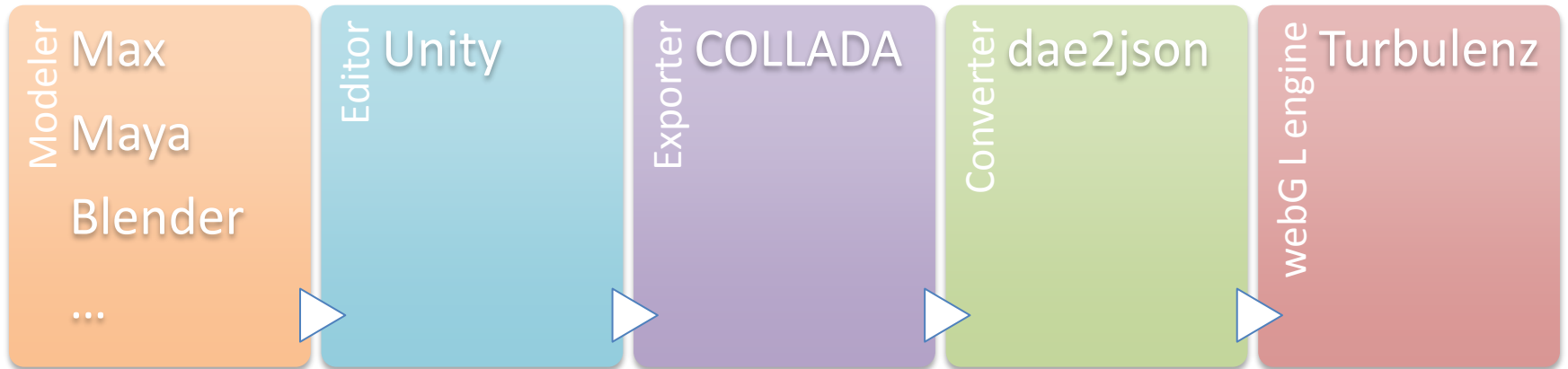
WIP: Unity Editor -> WebGL using COLLADA and glTF

Modeler
Max
Maya
Blender
...

Editor
Unity

Exporter
COLLADA

converter
COLLADA2GLTF

WebGL
Turbulenz
Threejs
...

https://github.com/KhronosGroup/glTF
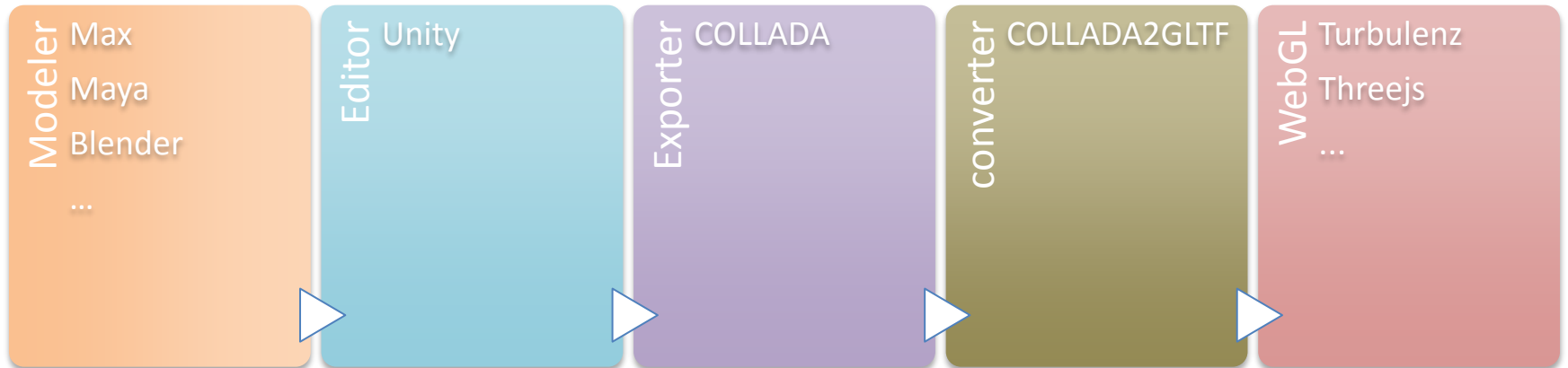
WIP: Unity Editor -> WebGL
using COLLADA , glTF and REST3D

converter glTF

REST3D

REST3D

Modeler Max

Maya

Blender

...

Editor Unity

Exporter COLLADA

WebGL Turbulenz

Threejs

...

http://rest3d.org
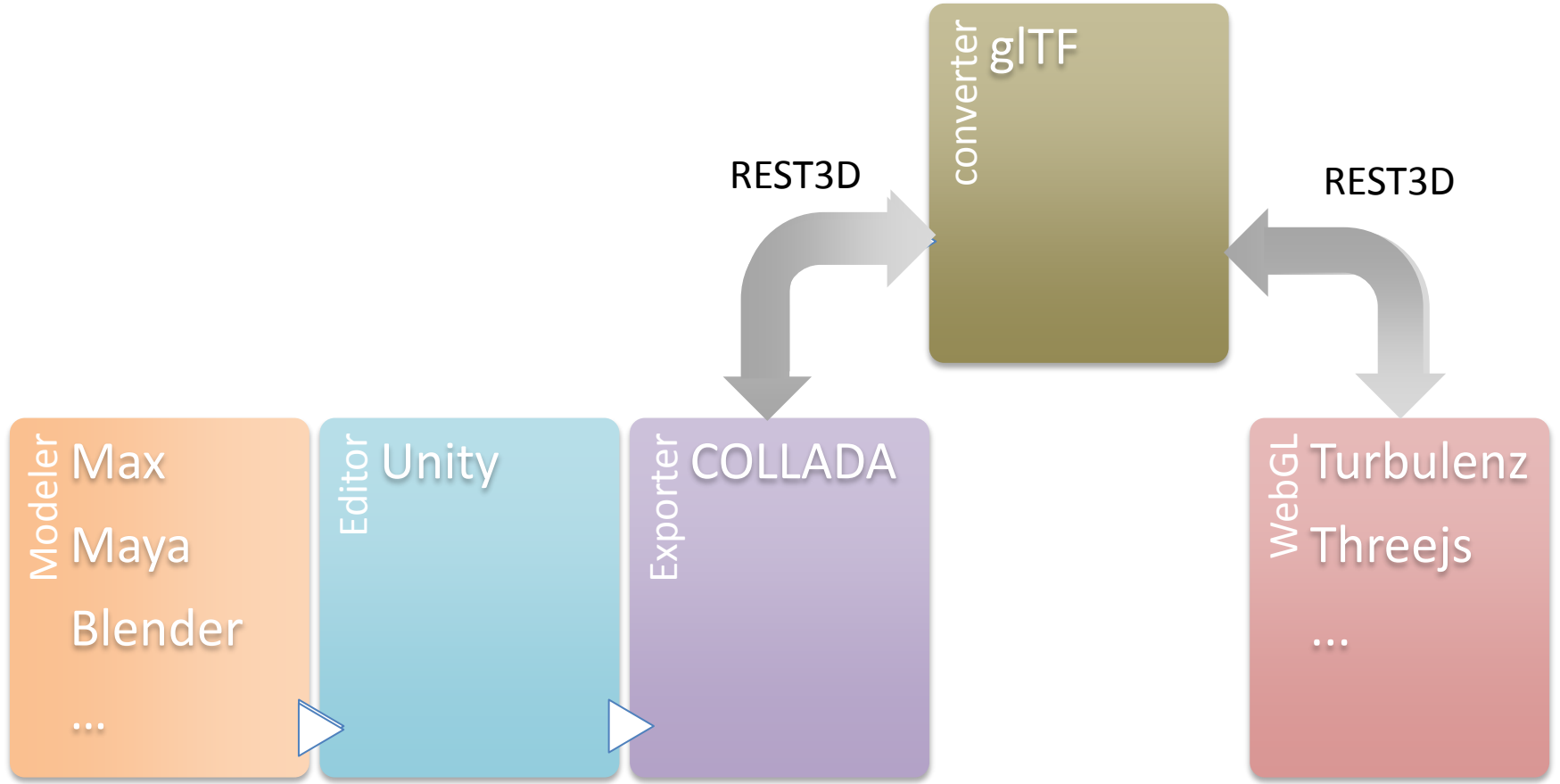
Exporter UI

COLLADA exporter v1.3.0 beta

Reset Options to default

Export choice	Selection Only

Header information

Author	
Comments	
Copyright	
Length unit name	meter
Lengh unit size in meter	1

Textures options

Texture copy	Do Not Copy Images
Texture folder	bootcamp-24
Conversion choice	Convert Images To PNG
Cube/Normal maps	Do Not Export Cube Maps
LightMaps export	Do Not Export Light Maps
UV set	Export Two UVSets

Animation options

Animation export	Do Not Export Animations
Export skins	Export Skins As Geometry

Terrain options

Terrain export	Export Terrain
Sampling multiplier	0.25
Texture choice	Single UVApproximation
Trees	Export Trees

Physics options

COLLADA Physics export	Export Physics

Miscellaneous options

Fix names to valid XML	Fix Names To Valid XML
Bake matrix	Bake Matrices
Camera export	Do Not Export Cameras
Light export	Do Not Export Lights
Shininess export	Inverse Shininess

Export!

---

xtures options

xture copy	Copy Images
xture folder	bootcamp-24
nversion choice	Convert Images To PNG
be/Normal maps	Export Cube Maps And Normal Maps
htMaps export	Export Lightmaps
ntmap UV option	Duplicate All Geometries
htmap Format	Save Lightmap As RGB24
;B) = [value]*A*(RGB)	2
set	Export Two UVSets

Animation options

|	
Animation export	Export Animations_Bake Matrices
Animation Clips option	Export All Clips
Evaluate frames	Export All Animation Frames
Single key	Eliminate Single Key Animation
Animation target	Multiple Targets Per Clip
Export skins	Export Skins As Controllers
node type="JOINT"	Mark Skeleton Hierarchy As Joints

Animated Skinned mesh

Unity

Turbulenz
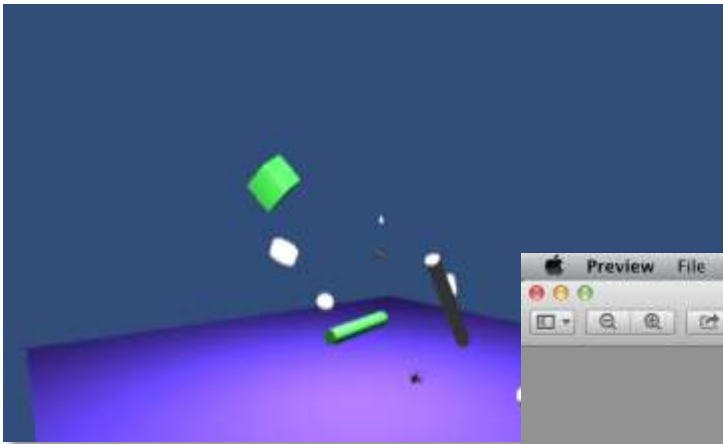Yes!!
(Picky on hierarchy, weapons attachment not by default in viewer app)
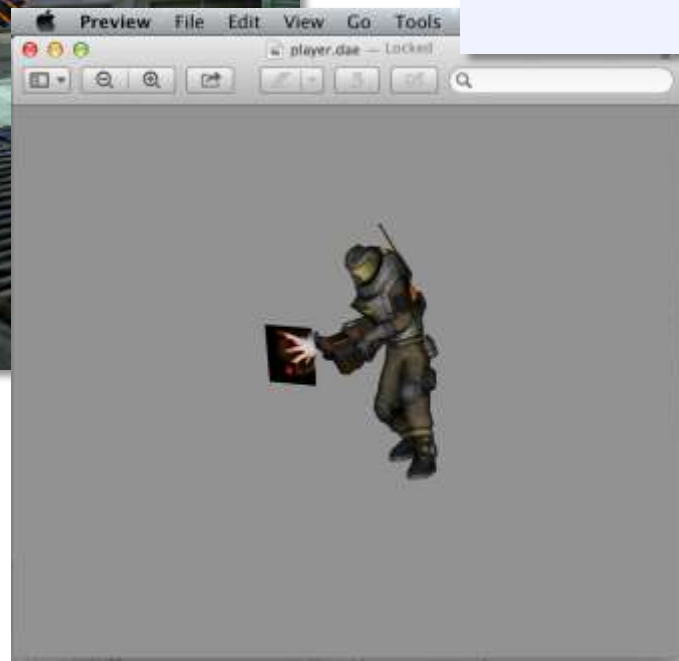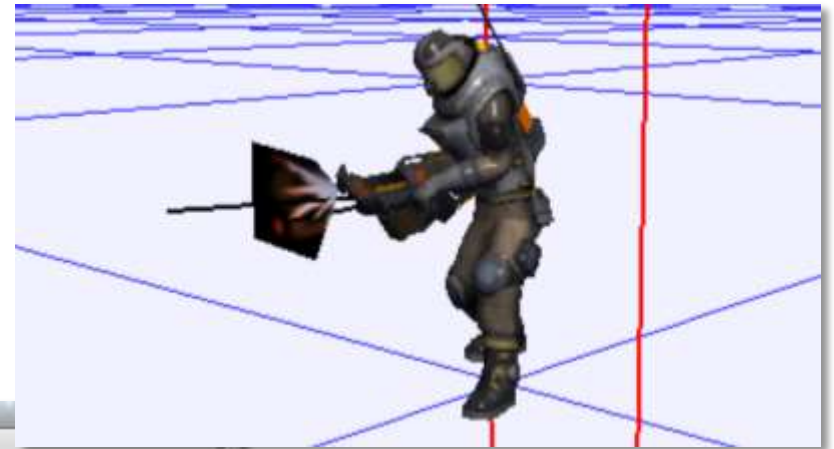
Preview
Yes!! (would love to select clip in preview)
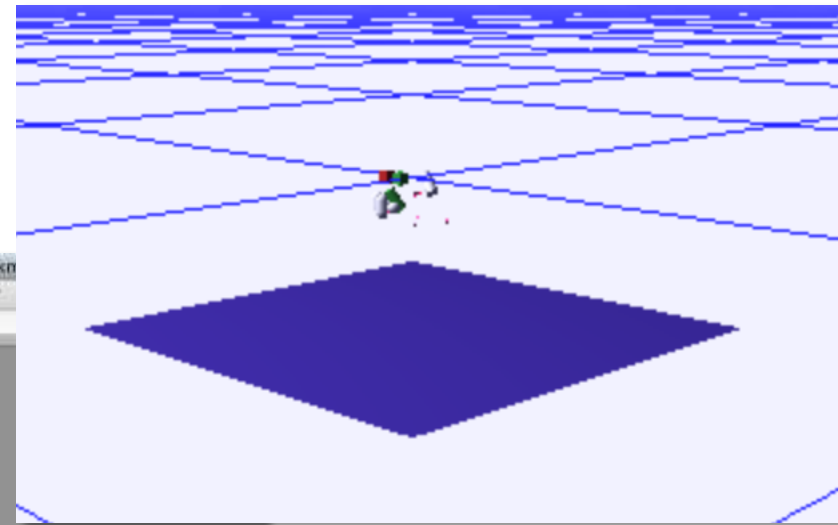
Physics ?

Unity
-   Need to have camera
and light to see physics
In 'run' mode
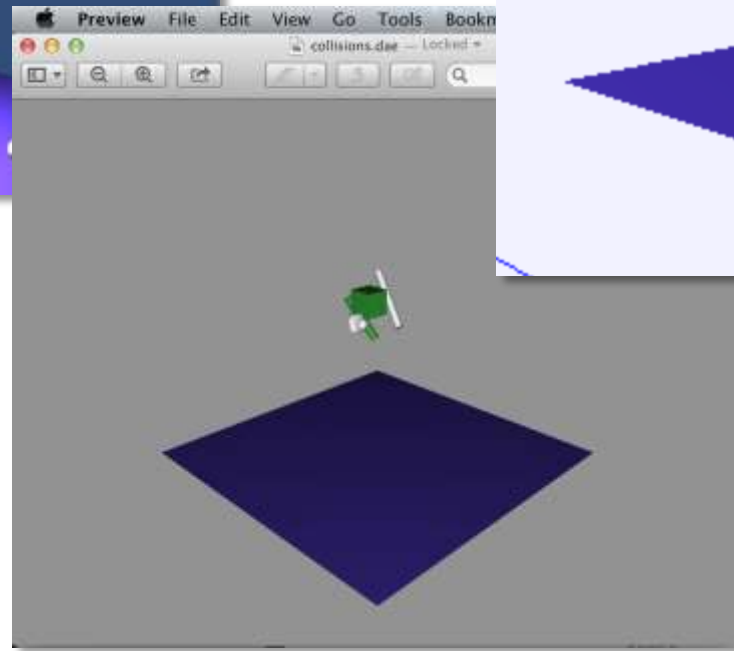
Preview
- No physics ☹

Turbulenz
Yes!!
(some limitations
getting resolved)

Lightmap (glow) ?

Unity

Preview

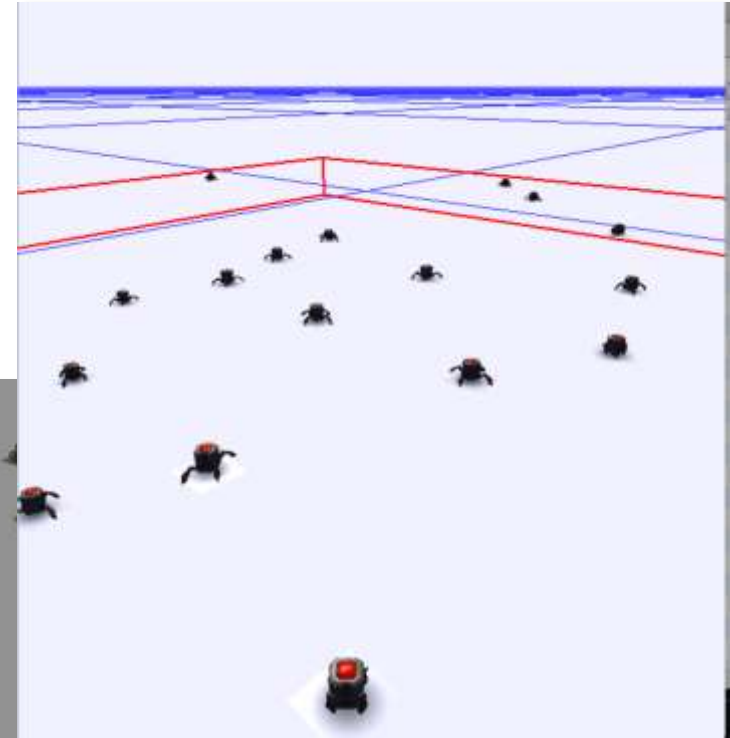Turbulenz
- Need user provided shader mapping

animations?

Unity
- SpiderRobots are 'prefabs'
Sharing the same animations-

Preview
-   Works only if animations
are shared!

Turbulenz
Yes!!
- A few animations
are wrong

Summary

- Unity -> COLLADA -> Turbulenz
  - COLLADA fulfill its promises:
    - game developer can combine tools from different vendors
  - Turbulenz does a great job importing COLLADA
    - Remaining issues are being worked on
  - glTF / REST3D
    - Those technologies will make it even easier and more efficient to bring COLLADA to WebGL apps

Thank you

- Links

  http://biz.turbulenz.com/developers

  https://collada.org/mediawiki/index.php/COLLADA_Refinery

  http://unity3d.com/unity/download/

  http://u3d.as/content/fl4re/collada-dae-exporter-for-unity/3cC

  https://github.com/KhronosGroup/glTF

  http://rest3d.org

- Questions?

  remi (at) acm (dot) com