

PolyTrans-for-Maya

An Industry Standard Native 3D Data Translation System for Maya. Imports/Exports all Major CAD, DCC & VisSim File Formats

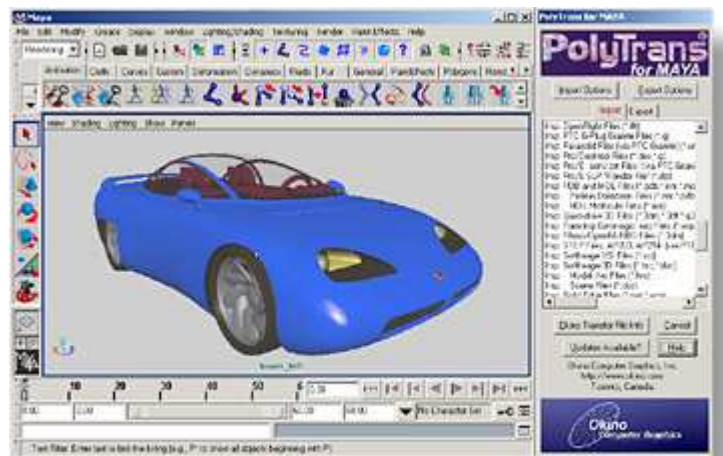
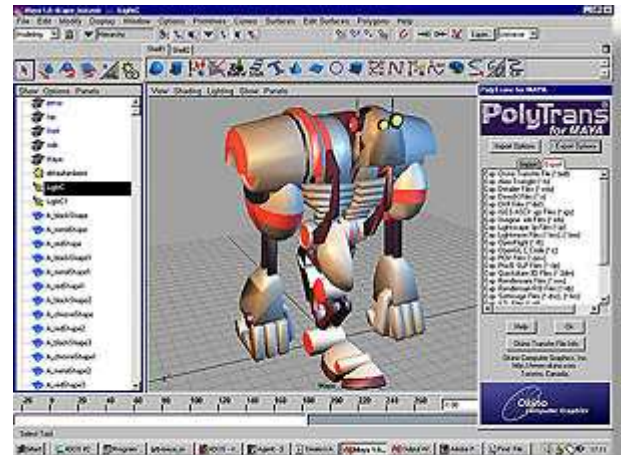
(This information applies equally to Okino's mirror twin "PolyTrans-for-3ds-Max" product)

PolyTrans-for-Maya is a premiere plug-in system for Maya (Windows) that allows Maya to freely exchange complete 3D scene data with virtually any other 3D software package, such as **3ds Max** (via PolyTrans-for-Maya and Okino .bdf format), **Lightwave**, **OpenFlight**, **Softimage-XSI**, **IGES**, **ACIS SAT**, **Autodesk Inventor**, **CATIA v4**, **CATIA 5**, **DirectX**, **DXF/DWG** (with **ACIS solids in DWG files**), **JT Open**, **Parasolid**, **Pro/Engineer**, **Renderman RIB**, **Solid Edge**, **SolidWorks**, **STEP**, **trueSpace** and many, many others.

PolyTrans-for-Maya has become one of Okino's most popular, specialized plug-in converter systems since it adds a lot of new functionality to the Maya software package itself. It also forms a natural and well refined pipeline between Maya and 3ds Max via the mirror twin '**PolyTrans-for-Maya**' and '**PolyTrans-for-3ds-Max**' native plug-in modules.

PolyTrans-for-Maya breaks down all previous data translation barriers and truly makes Maya a universally open software package. In the tradition of all Okino 3D data translators, resulting translated files are '**Render Ready**' meaning that they can be loaded and rendered in the destination program (Maya, Softimage-3D/XSI, 3ds Max, Lightwave, etc.) with little or no changes necessary. The translation process accommodates polygonal meshes, trimmed NURBS, hierarchy, vertex normals/colors/texture-coordinates, material and texture mapping parameters, lights, cameras, object/camera/light animation conversion (file format specific) and automatic 2D bitmap conversion (when necessary).

PolyTrans-for-Maya provides scene, trimmed NURBS (format specific) and animation conversion (format specific), in dozens of state-of-the-art file formats. Our programming team typically spends between 6 months and several years (the latter on 3ds max, Maya, Lightwave, SolidEdge, SolidWorks, Inventor, etc) writing each translator, and we strive to overcome the "hard" problems often encountered in real world situations. In addition, our hands-on technical support is well known; you always talk with our programmers directly and we spend a good chunk of our day



adding small features here and there for those in need of file format refinements (see our testimonial WEB page.

▶▶ Production Pipeline Examples of PolyTrans-for-Maya

There are hundreds of ways that PolyTrans-for-Maya could be used to optimize the usage of Maya in a production pipeline where several different 3D packages are used, or simply in a one-man shop where Maya data has to be converted to/from another 3D package. Some typical examples are:

- ▶ The absolute most robust and highest quality 3D converters in the industry with 2 decades of development, used extensively by 10's of thousands of professional end-users.
- ▶ 20+ years of very strong and robust CAD file support. Okino has always been the most cost effective provider of solids-based CAD formats including: **ACIS, Autodesk Inventor, CATIA v4, CATIA v5, DXF/DWG, IGES, JT Open, Parasolid, Pro/Engineer, Solid Edge, Solid Works, STEP, STL, VDA-FS** and **VRML+X3D**.
- ▶ The mirror twin PolyTrans-for-3ds-Max and PolyTrans-for-Maya plug-in systems form the most technically accurate and robust bi-directional conversion system between 3ds Max and Maya.
- ▶ Tight integration into 3ds Max's and Maya's core scene graph allows all conversions to be performed from within the user interface of 3ds Max or Maya. Stand-alone version for all other conversion tasks.
- ▶ Okino pioneered the process and methods of animation cross conversions! 3ds Max, Maya, Collada, DirectX, FBX, Lightwave, Softimage|XSI, VRML2/X3D, U3D, XAML and more. Very robust and well refined.
- ▶ Proper conversion of skeletons and bones between Maya and 3ds Max, Lightwave, Collada, FBX, Softimage|XSI, U3D and DirectX. Going from Maya to 3ds Max is particularly fraught with problems but the automatic bone re-orientation algorithm resolves such problems automatically. See this WEB page for a full explanation, <http://www.okino.com/conv/skinning.htm>.





FBX 'Samurai' skinned mesh (with skeleton) model courtesy of Kaydara/Alias/Autodesk.

- ▶ Direct import and export of Softimage|3D database scenes, .hrc files and SoftImage|XSI files from within the Maya user interface.
- ▶ Bullet-proof and robust import/export of DXF and DWG files. The OkinoDXF/DWG reader reads in and converts literally any DXF or DWG file (including embedded ACIS solids) then optimizes it into a render-ready model. Huge files can be processed quickly. Memory usage is low for large scenes.
- ▶ Strong and production-worthy support for the popular Lightwave and 3D Studio packages, among others. These translators import and export complete scenes files, bitmaps and all related information.
- ▶ Import parts, assemblies, hierarchy and materials directly from a running copy or native file of Autodesk Inventor, Solid Edge or Solid Works. Unique!
- ▶ Strong ties to the visual simulation (VisSim) community with proven OpenFlight, Renderware, VRML 1.0, VRML 2.0 and X3D support.
- ▶ Automatic conversion of foreign 2d bitmap image file formats to/from those recognized by Maya. Native Alias PIX and IFF (not Amiga IFF) 2d bitmap read/write support was also developed and added to the core PolyTrans software.
- ▶ Access to robust polygon processing tools which can take impossible-to-render datasets and turn them into renderable models. Functions include auto-welding, auto-unification of normals, reorientation of normals, removal of double sided polygons and more. A complex polygon reduction system is also available in the stand-alone PolyTrans.
- ▶ Okino provides excellent, hands-on and personal tech support, for free, with each software package. We know 3D graphics and data translation inside-out!

▶▶ Pricing, Availability and Packaging

"PolyTrans-for-Maya" for Windows is available by purchasing either of Okino's base software products, PolyTrans (\$395, PT-WIN) or NuGraf (\$495, NRS-WIN), and the "DCC/Pack" add-on option (\$245), or any other combination of add-on converter packs which includes the "DCC/Pack" option. The *base package* plus the *DCC/Pack* license forms the special "**PolyTrans-for-Maya**" product.

By purchasing this combination of licenses you will gain this functionality:

- ▶ If you purchase the base NuGraf package (\$495, NRS-WIN), you will also have a great package for rendering, data manipulation, texture mapping and material editing. In order to convert animation data perfectly between all the major animation systems

Okino has had to develop a complex animation "import, playback and conversion" core engine; this engine contains the animation functionality of Maya, 3ds Max, Softimage, Lightwave, DirectX, Collada, FBX, U3D, VRML 2/X3D, etc. The benefit of this long development is that NuGraf can import, play back, edit and view all of these aforementioned animation file formats, or it can create complete animations (compliant with the mathematics and techniques of these named file formats) from scratch within its Microsoft Windows user interface: this ability to import/export between all these incompatible animation file formats, or to modify/edit/create compatible animation sequences, is a completely unique feature of the NuGraf software in the world of 3D graphics. NuGraf is our main software package developed at Okino, whereas the stand-alone "PolyTrans" is only a derivative (same source code, same executable, just simpler functionality); the difference in price is \$100.

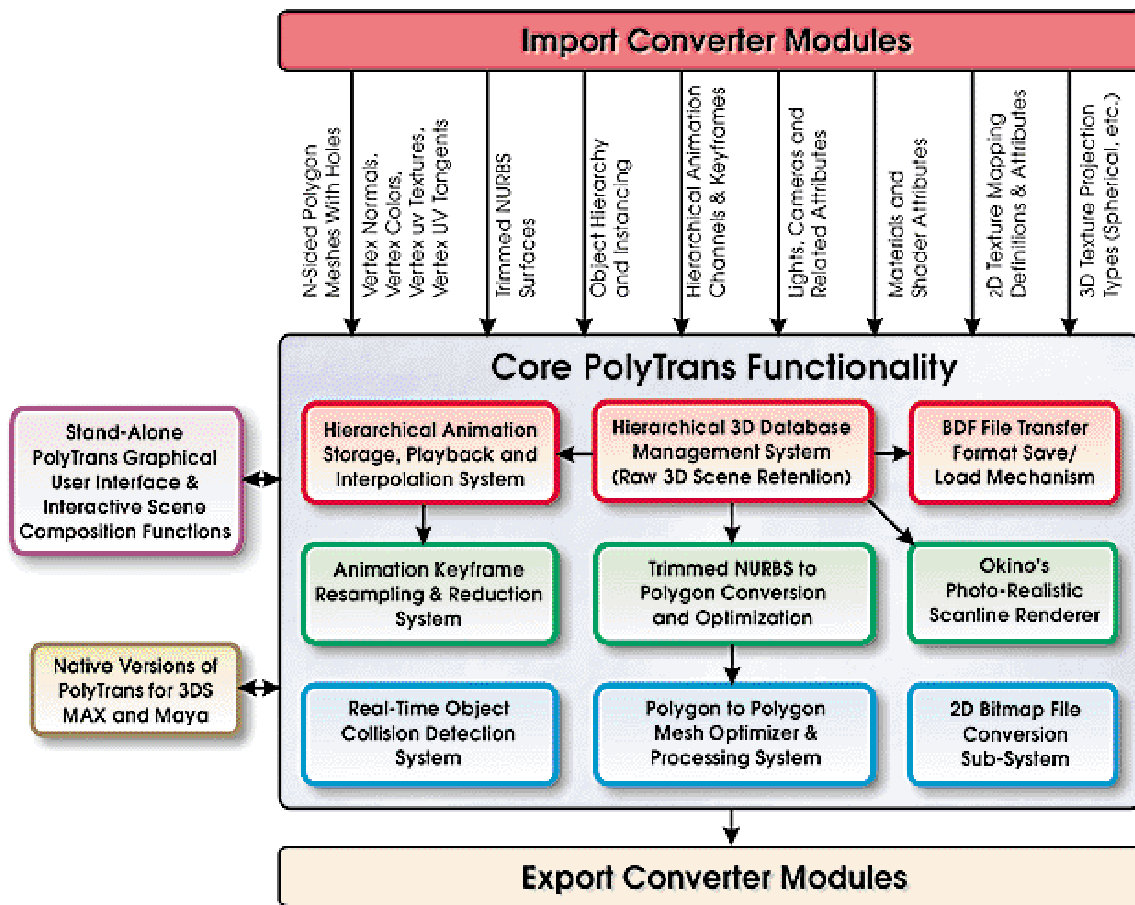
- ▶ If you purchase the base PolyTrans package (\$395, PT-WIN), you will have a stand-alone Microsoft Windows program which can read and write all of the Okino supported 3D file formats, except 3ds Max (.max) and Maya (.ma, .mb) which require the special native plug-in versions of PolyTrans to be used in their respective programs. This program can also view the imported models in fully shaded OpenGL mode, playback imported animation, perform polygon processing, edit light and cameras, and produce scanline renderings . If you need extensive material and texture parameter editing, 2d bitmap and 3d procedural texture mapping, interactive texture projections, scanline or multi-threaded ray tracing, or a more complex user interface, then consider purchasing Okino's NuGraf software for an additional \$100 - everything of PolyTrans is included in the NuGraf executable.
- ▶ The "DCC/Pack" license will provide native PolyTrans import/export functionality within the Maya user interface (via the Maya plug-in architecture). This is provided regardless of whether you purchase the base PolyTrans or NuGraf package.
- ▶ Native PolyTrans import/export functionality within the 3ds Max user interface.
- ▶ The "DCC/Pack" license will also include add-on converter functionality for FBX, Softimage .dotXSI file format, OpenFlight and the native PolyTrans-for-Softimage|XSI plug-in system.
- ▶ You can also opt for the "CAD/Pack" and "Granite/Pack" series of optional add-on converter modules which add dozens of major 3D CAD file formats to the PolyTrans-for-Maya plug-in system.

Platforms and Availability

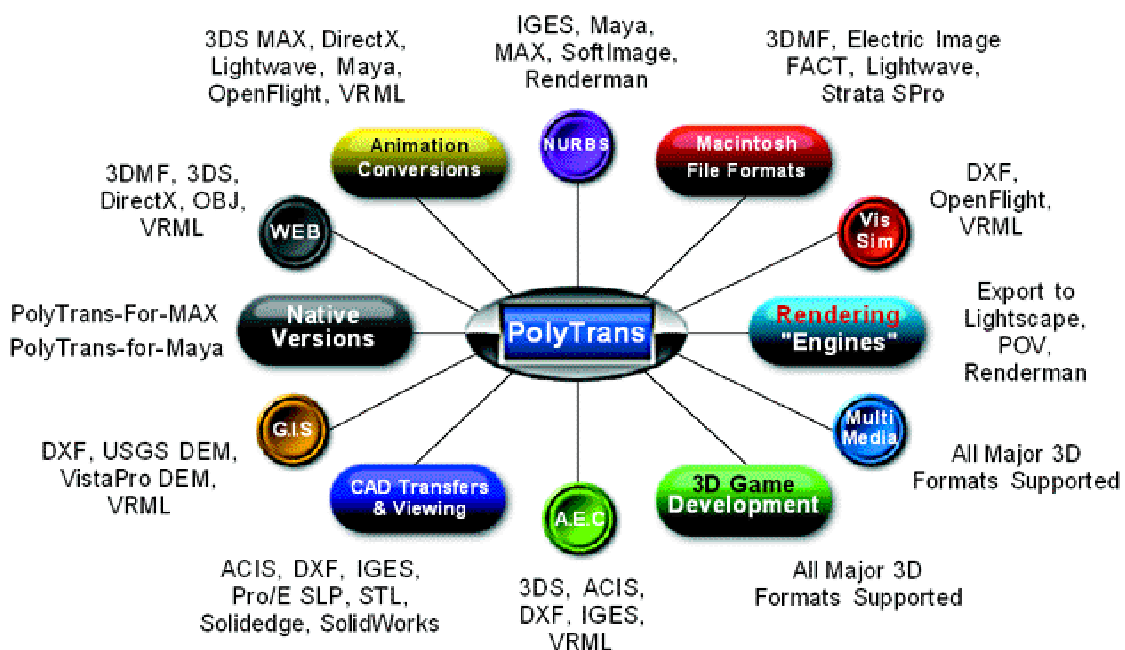
PolyTrans-for-Maya is available for the Windows version of Maya. This version has been available to Okino customer since June 1999 and has become an industry favorite. PolyTrans-for-Maya is purchased as part of the "DCC/Pack" optional add-on license, or any other add-on converter bundles which includes the "DCC/Pack" license.

Further Information

PolyTrans converts all important aspects of a 3D scene; this includes all geometry (meshed polygons with recursive holes, trimmed NURBS and quadrics), object hierarchy, pivot points, smoothing data (vertex normals), (u,v) texture coordinates, bump mapping information (U/V tangent vectors), lights, cameras and all texture projection methods. In addition, PolyTrans accurately matches the color, shading and texture mapping parameters between the imported and exported file formats resulting in models that will render faithfully inside Maya or in a desired target rendering program.



PolyTrans solves professional data translation problems such as complete scene conversions to/from Maya; bidirectional scene and animation translation to Lightwave; direct access to Softimage databases from inside Maya; animated mesh output to most supported animation file formats; complex CAD transfers (ACIS, DXF/DWG, IGES, Parasolid, Pro/E, STEP, SolidWorks, STL, VDA-FS); output to OpenFlight for tagging; fast DXF imports; and many more applications.

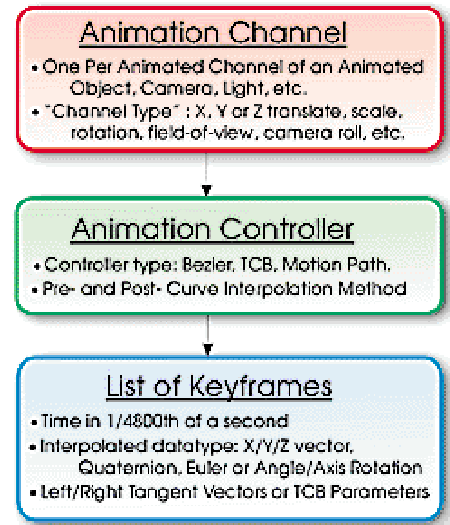


Okino software is used world wide by thousands of professionals, covering such varied groups as engineering, manufacturing, government, defense related, production studios, digital effects houses, animation studios, 3D content developers and most major 3D game development companies. An interesting list of notable users can be viewed online at <http://www.okino.com/conv/users.htm>.

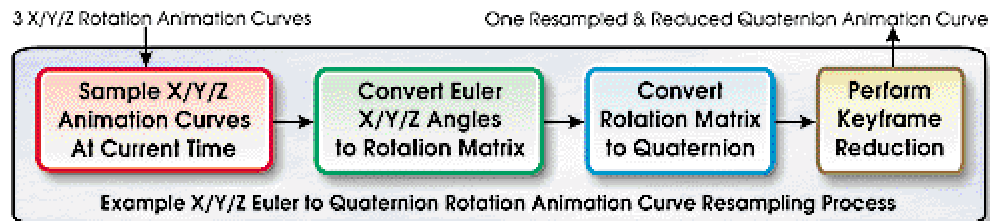
▶▶ Animation Conversion Through Accurate Keyframe Resampling & Reduction

Through years of research, development and refinement, PolyTrans has come to include the industry-leading major feature of animation conversion. Simply put, animation conversion is a hard problem! To convert between the different mathematics used by each major 3D animation package, and their different methods of internally representing 3D animated objects, Okino Computer Graphics has developed a unique "animation conversion engine". This engine allows raw animation data to be imported from the most popular 3D animation programs, accurately played back in real-time, resampled to alternate forms of animation mathematical representation and exported to other 3D animation file formats. Note that PolyTrans converts function curve based animation; it does not convert procedural or Inverse Kinematics (IK) animation data.

As shown in the right diagram, the internal "engine" stores the raw imported animation data as a series of hierarchical "channels" (such as X/Y/Z translation), each of which has a "controller" which simulates the most popular animation interpolation methods (Bezier, TCB, etc.), and to each controller a series of keyframes representing the animation curve over time. This ensures accurate retention of the imported animation data.



A vital aspect of accurate animation conversion is the "keyframe resampling & reduction" algorithm of PolyTrans; as shown below, this algorithm allows incompatible animation methods to be converted with tolerance-based accuracy. The example below shows how X/Y/Z Euler rotations (from Lightwave or Maya) are converted into the mathematically different Quaternion rotation method (used by DirectX and 3ds Max, for example).



▶▶ Supported CAD File Formats

The list of CAD importers (most of them "solids based", BREP with crack free tessellation), includes:

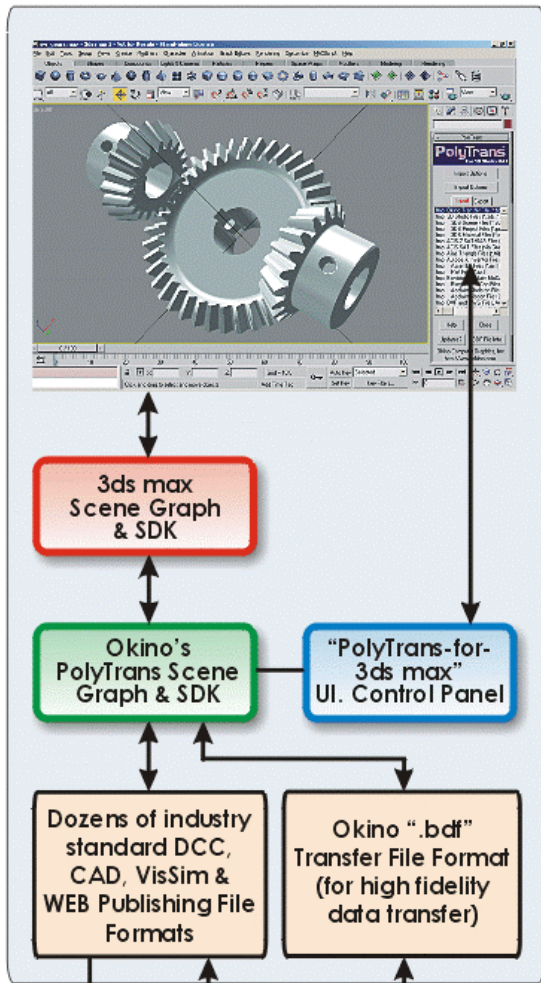
Import CAD Format	Reads Files from Disk?	Imports directly from live CAD program?	Based on which technology or developer?	File Extensions
ACIS SAT	✓		Spatial ACIS Toolkit	.sat
ACIS SAT	✓		PTC Granite	.sat
Autodesk Inventor	✓	✓	Okino	.ipt, .iam
CATIA v4	✓		Spatial	.model, .dlv, .exp
CATIA v5	✓		Spatial	.catpart, .catproduct
DWG/DXF	✓		OpenDWG	.dwg, .dxf
Granite "G-plugs"	✓		PTC Granite	.g
IGES (PTC)	✓		PTC Granite	.iges, .igs
IGES (Okino)	✓		Okino	.iges, .igs

Parasolid	√		PTC Granite	.x_t
Pro/Engineer	√		PTC Granite	.asm, .prt
Pro/DESKTOP	√		PTC Granite	.des
Rhino-3D/OpenNURBS	√		OpenNURBS	.3dm
Solid Edge	√	√	Okino	.asm, .prt
Solid Works	√	√	Okino	.sldprt, .sldasm
STEP	√		PTC Granite	.step
VDA-FS	√		PTC Granite	.vda

Tight Data Translation Connection Between 3ds max and Maya

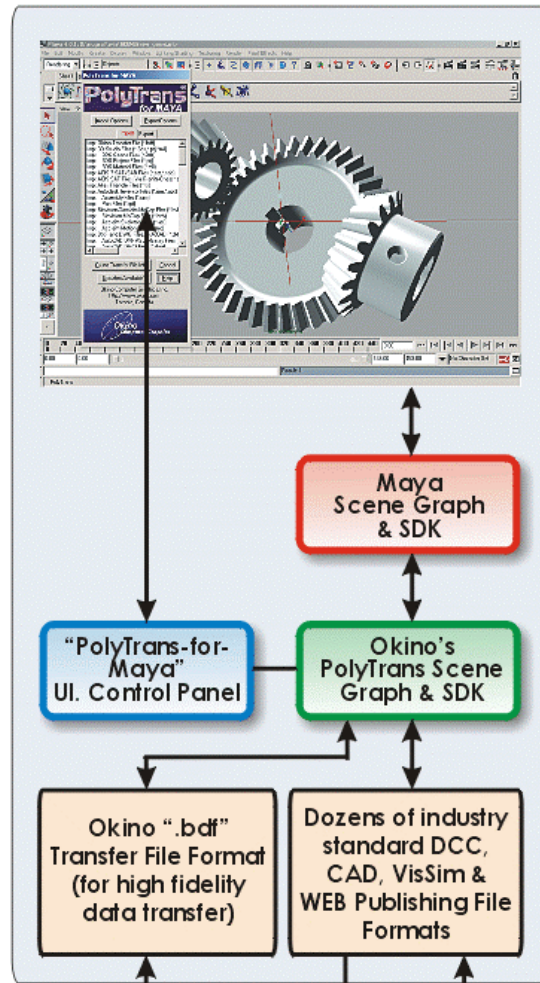
A pivotal aspect of the Okino software for many of our users are the **PolyTrans-for-MAX** and **PolyTrans-for-Maya** native plug-in systems. These are two of the most professional, longest developed and well supported 3D converter plug-in systems for 3ds max and Maya. These modules allow 3ds Max and Maya to directly import/export all of the Okino supported file formats from within their respective user interfaces. Other common uses of the plug-in systems is for bidirectional 3ds-Max/Maya conversions (via the Okino .bdf file format), import & optimization of large CAD datasets from all major 3D CAD packages & file formats, import/export to all 3D gaming file formats (including skinned mesh and skeleton conversions), OpenFlight VisSim conversions, and of course bidirectional conversions to most other 3D file formats and software packages (from Lightwave, to Softimage-3D, to Softimage-XSI, VRML2/X3D, FBX, Collada, DirectX and dozens more).

3ds max



3D File Output via PolyTrans
 3D File Input via PolyTrans
 (Including strong data connectivity to Lightwave, XSI, OpenFlight & others)

Maya



3D File Output via PolyTrans
 3D File Input via PolyTrans
 (Including strong data connectivity to Lightwave, XSI, OpenFlight & others)

Scene Transfer Pipeline
 Okino .bdf transfer file format moves MAX <--> Maya scenes, including geometry, materials, 2D textures, automatic bitmap conversion, lights, cameras, hierarchy, animation, skeletons (with proper & smart bone reorientation algorithms), mesh skinning weights, and more. Under control of dozens of options.