

## 3.3.6.0

### Milestone 3.3.6

#### Enhancements

- **Adaptive specular roughness clamping:** Clamping all specular reflections with the same minimum roughness after the first bounce greatly reduces the amount of fireflies in the final image due to reflective caustics, but can cause what should be mirror-like glossy reflections to become visibly blurred. A new adaptive technique has been implemented that will keep these reflections sharp when seen through other glossy reflections. (trac#2201)
- **Glossy refraction in the standard shader:** A new parameter called `refraction_roughness` has been added to the standard shader allowing it to simulate microfacet-based glossy refraction effects. This parameter ties in to the IOR parameter to control the effect, causing refraction through rough surfaces with high IOR to appear blurrier than smooth surfaces with low IOR. The number of samples is controlled by the new `GI_refraction_samples` render option. (trac#2016)
- **RPATH points to \$ORIGIN in Linux:** On Linux systems, the RPATH binary header in `libai` is now hardcoded to `$ORIGIN`. This makes `libai` to always link first with libraries residing in the directory where `libai` itself is located, avoiding loading libraries with mismatched versions that may be reached through the `LD_LIBRARY_PATH` environment variable. It is now ensured that `libai` will be linking with the libraries deployed in the official Arnold package as both `libai` and its dependencies are located in the package directory tree. Therefore we encourage users *not* to relocate the Arnold binaries outside the `<arnold_root_dir>/bin` directory. (trac#2135)
- **OIO headers and libraries:** We now distribute the OpenImageIO headers and Windows `.lib` file for the same exact version of OpenImageIO that Arnold is linking with. For shader writers and developers who need to link to OIO in their own code, this makes it easier to always be in sync with Arnold and avoid versioning conflicts. (trac#2089)
- **License diagnostic mode in kick:** A new option, `-licensecheck [<port>@<host>]`, has been added to `kick`. This allows you to check the status of the license server and to retrieve the number of "total" and "in-use" licenses. Below is a usage example. (trac#2144)

```
$ kick -licensecheck
Connecting to license server on 5053@localhost ... OK

product:      arnold
version:      303
expires:      permanent
total licenses: 1
inuse:        0
timeout:      240
minimum timeout: 120
```

#### API additions

- **AiNodeDestroy():** This new API function allows you to destroy a node, releasing all of its associated memory allocations, which can be used to remove a node from the scene (as long as a render is not in progress). (trac#2202)
- **AiMicrofacetBTDFIntegrate():** This new API function implements the glossy refraction effects now available in the standard shader. Please note that, although anisotropic refraction is not yet implemented, we decided to "future proof" this API and request UV tangent vectors and two separate roughness values; for now, just pass NULL as the tangent vectors and pass the same value for both roughness values. (trac#2016)

```
AI_API AtColor AiMicrofacetBTDFIntegrate(const AtVector *N, AtShaderGlobals *sg, const AtVector *u,
const AtVector *v, AtFloat rx, AtFloat ry, AtFloat eta_i, AtFloat eta_o, AtColor transmittance);
```

- **Python binding for AiNodeClone():** When this API function was introduced, it missed the corresponding Python binding. (trac#2204)
- **Set/Get license server:** New API functions have been added in order to programmatically set and get the port and hostname where the license server is located. The hostname and port set by `AiLicenseSetServer()` overrides the use of the values configured in the environment variables `ARNOLD_LICENSE_HOST` and `ARNOLD_LICENSE_PORT`. (trac#2103)

```
AI_API AtBoolean AiLicenseSetServer(const char* host, unsigned int port);
AI_API AtBoolean AiLicenseGetServer(char* host, unsigned int& port);
```

- **License status query:** A new API function has been added to check the connection to the license server, check the RLM service (and the existence of available licenses in the server), and get information about all the installed/inuse licenses in the server. (trac#2200)

```
AI_API AtInt AiLicenseGetInfo(const char* host, unsigned int port, std::vector<AtLicenseInfo>&
licenses);
```

#### Incompatible changes

- **Renamed focal\_distance to focus\_distance:** We have decided that it makes more sense to call this camera control `focus_distance` since that more accurately describes its functionality. "Focal distance" was sort of a mix between "focal length" (which has a well defined meaning in optics) and "focus distance". Note that the old name is still supported, at the cost of a "deprecated synonym" warning, so strictly speaking this is not an incompatible change yet. (trac#2220)
- **Hidden internal symbols in linux:** We were previously exposing internal Arnold symbols in Linux, which could cause symbol collisions with other applications (e.g. Katana). We now only export symbols which are explicitly and properly marked in the public Arnold header files with the `AI_API` prefix. (trac#1966)

#### Bug fixes

Ticket	Summary	Component	Owner	Priority	Version	Created
#2199	specular roughness clamp is broken	arnold	alan	critical	3.3	4 weeks
#2194	specify which shader global vectors are unnormalized	arnold	alan	major	3.3	4 weeks
#2196	Crash on OSX 10.5 with 'kick -info'	arnold	oscar	major	3.3	4 weeks
#2203	Arnold Python bindings broken on MacOSX	arnold	oscar	major	3.3	2 weeks
#2205	Missing AiColorCorrupted for AtRGBA type	arnold	angel	major	3.3	2 weeks
#2207	crash when switching off/on `skip_license_check`	arnold	oscar	major	3.3	2 weeks
#2218	failed bucket writes should abort the render	arnold	marcos	major	3.3	9 days
#2219	displacement padding should not be ignored for deformation motion keys	arnold	marcos	major	3.3	9 days
#2225	Procedurals don't recognize .ASS and .OBJ uppercase file extensions	arnold	oscar	major	3.3	6 days
#2233	quad_light importance map memory is not reported correctly	arnold	marcos	major	3.3	4 days